Computer Applications

Howard High School
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Word Fundamentals

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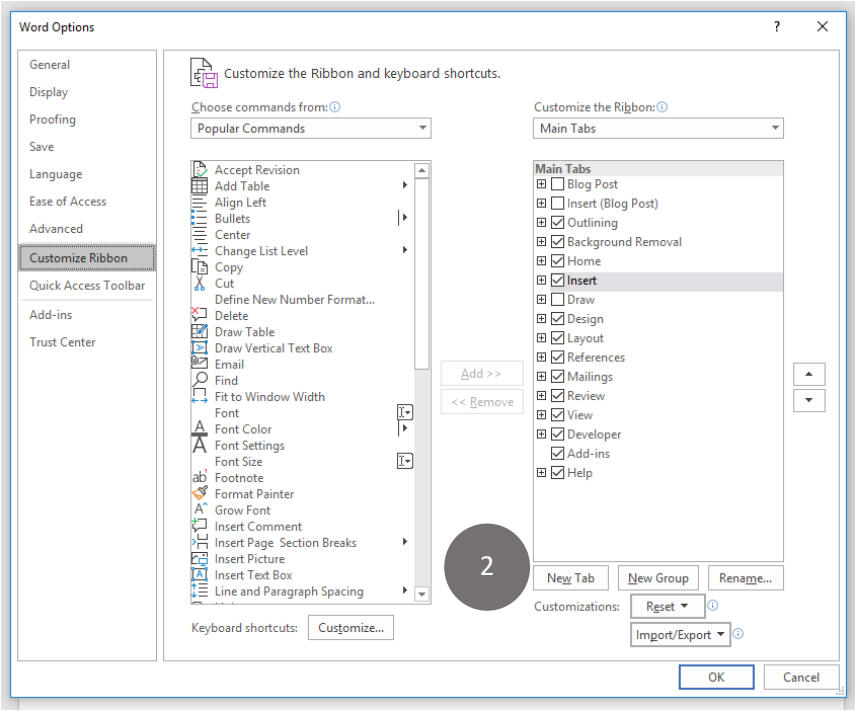
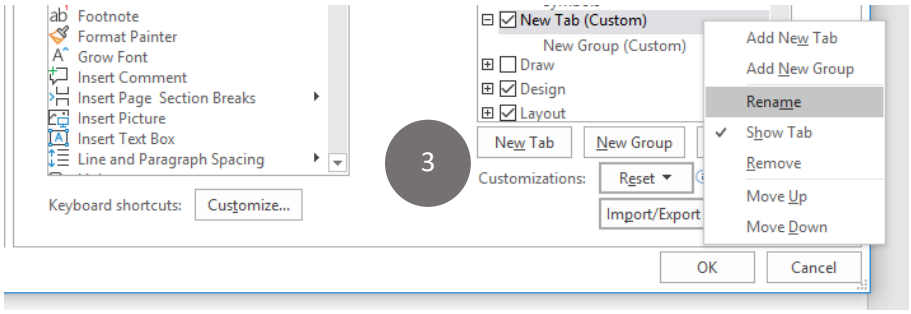
Lesson 1: Customize the Ribbon and Quick Access Toolbar

The Microsoft Office applications give you the ability to create your own Tabs and Groups on the Ribbon and to add and delete tools from the Quick Access Toolbar. This helps you get things done faster and eliminates the need to remember where your most commonly used tools are located. In this example, we're going to create two Tabs. The first one will be called "Business Letters" and we'll create a Group that includes the Email, Bullet and Table tools. The second Tab will be called "Newsletter" which will include the Insert Picture, Font Color and Text Box tools.

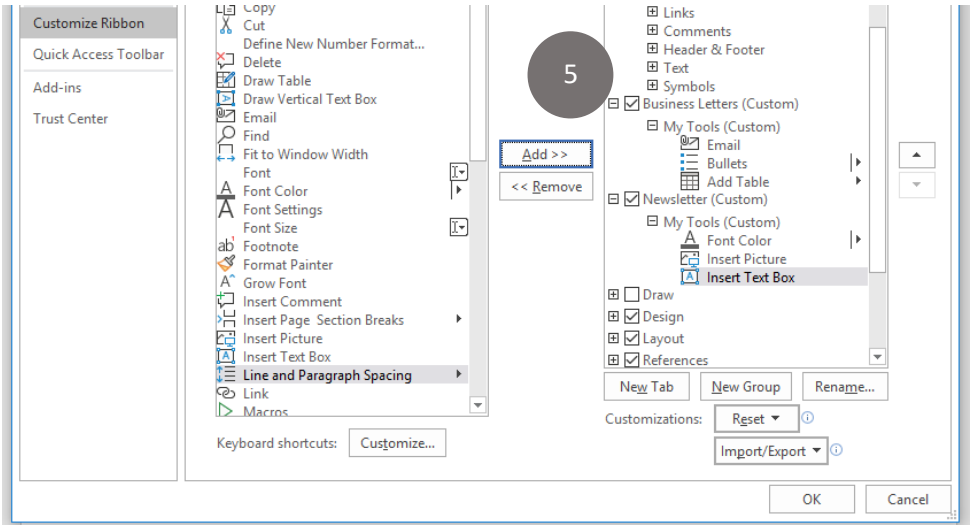
1. Click on the File tab, then click on Options.
2. Click on Customize Ribbon, New Tab.



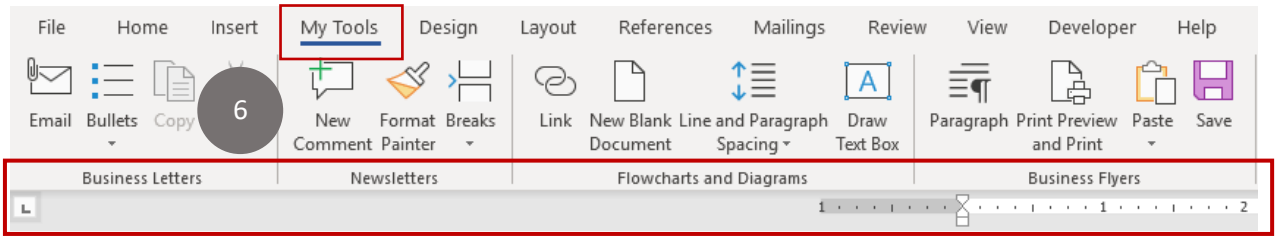
3. New Tab and New Group will appear. Right-click and rename the Tab "Business Letter" rename the Group "My Tools":



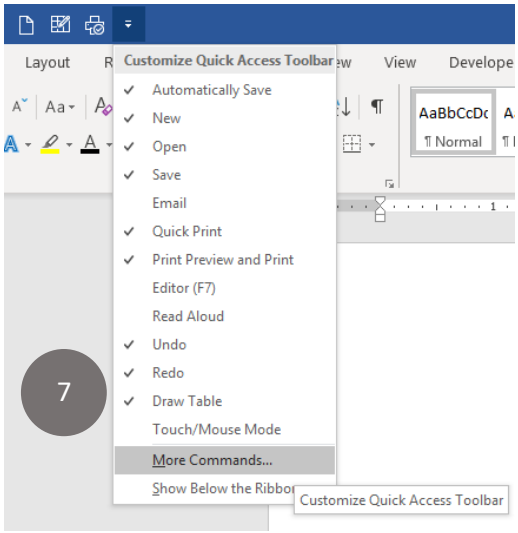
4. Repeat these steps to add a Newsletter tab.
5. From here, you can use the Add button to add to tools to each group. Click OK when finished.



6. You can now see where the two new tabs were added to the ribbon. You could have also created one Tab with multiple Groups; here's an example of a New Tab called "My Tools" that has four groups in it.



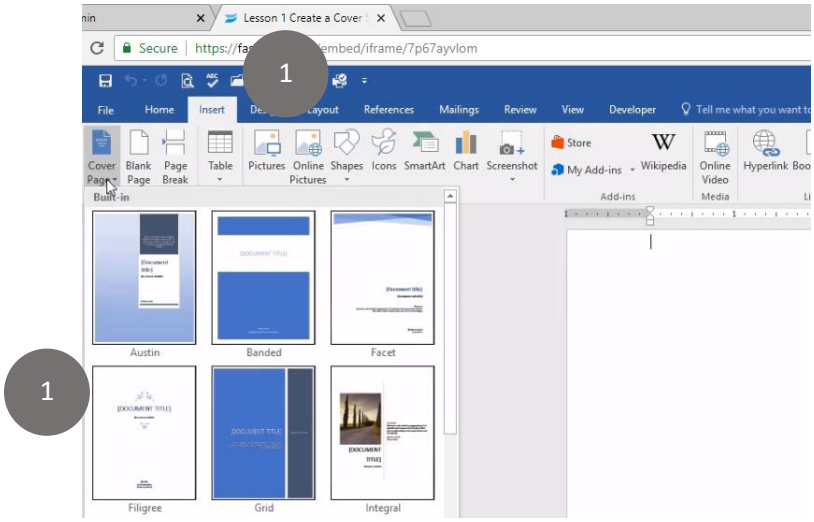
7. To customize the Quick Access Toolbar, click on the down arrow and choose More Commands. Choose the Commands you want to add and click OK. To see the Quick Access Toolbar icons more clearly, you can move it to the bottom of the Ribbon by selecting the Show Below the Ribbon option:



Lesson 2: Create a Cover Sheet

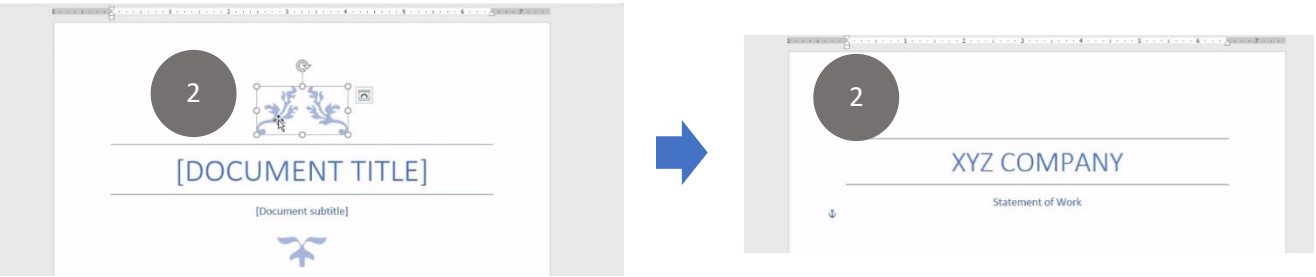
In this lesson, we will input a cover sheet into a Word document. By using the tools that are already available, you can save time and save the cover sheet as template.

1. Click on the Insert tab and choose Cover Page from the Pages group.



Let's say in this example we're creating a business proposal for a business called Midwest Communications and that we'll choose the Filigree Design as the design we what to start with and customize it.

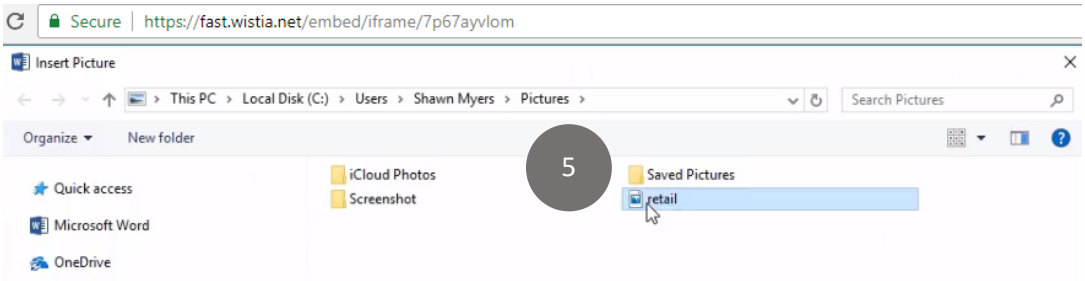
2. Delete the clipart images, then we'll click on the Placeholder for the title, and type in the words "XYZ Company". Press the Tab key, then add the subtitle, which we'll call Statement of Work.



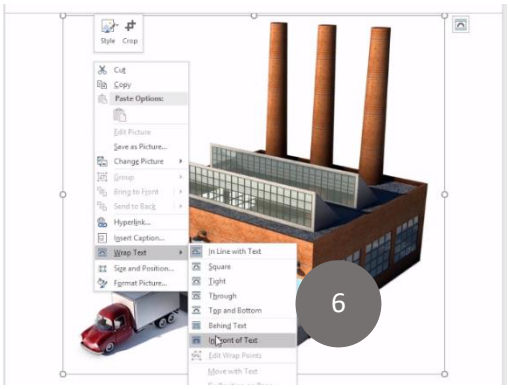
3. Click on the placeholder for the date, which opens a calendar. This placeholder allows you to select the date using a calendar. Let's say for example the meeting is scheduled for next Tuesday, so we can select that date from the calendar and insert it.

4. Type the company name; in this example we don't want the company address on the cover sheet, so we'll click on it twice to delete it.

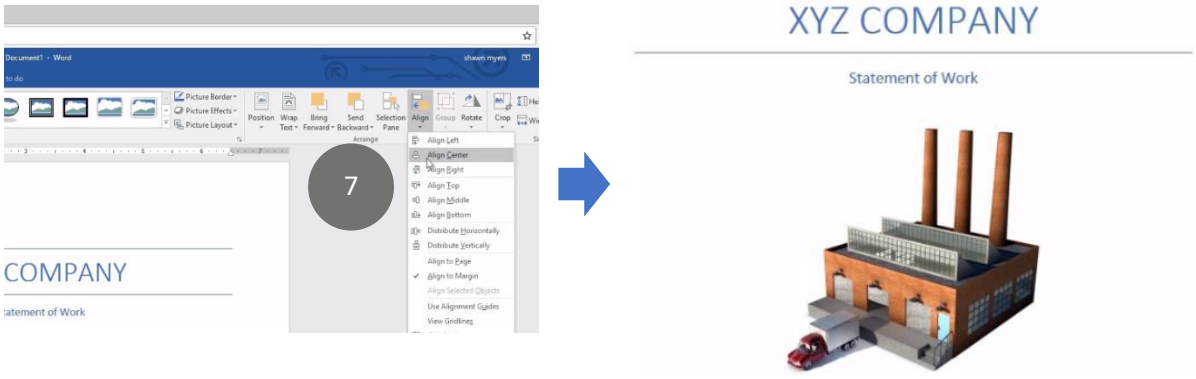
5. In the center of the document we want to add a picture, which can be done by clicking on the Insert tab, then choosing a picture file from your hard drive on your computer or from the Online pictures option. For this example, we'll double-click on the photo called "retail" (Lesson 2.retail).



6. To properly align the picture in the center of the Title page, let's right click on the picture, choose Wrap Text and choose In Front of Text.



7. Click on the picture, then go to the Align button drop-down and choose Align Center of the title page and align it with the text.

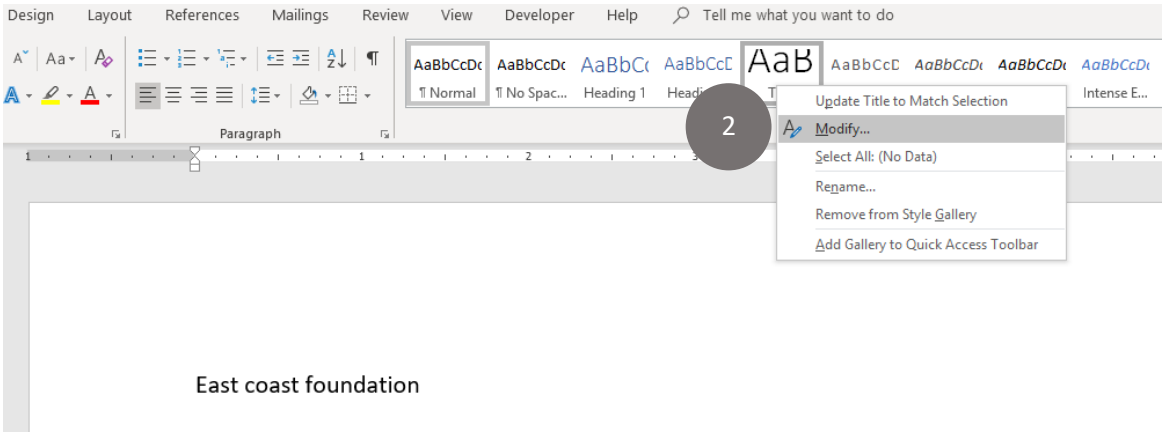


Lesson 3: Text Formatting

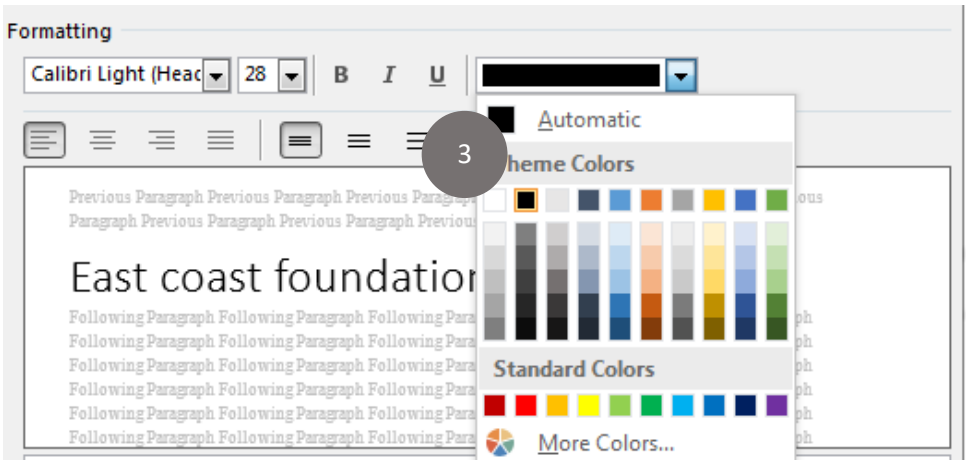
In this lesson, we're going to look at the different styles and formatting options that can be used in a Word document that includes a list of words, a bulleted list or a numbered list.

To see the different Style options, click on the Home tab and look at what's available. You can see here that many of the style options will change both the size of the font as well as the color, so it is good practice to change the default settings prior applying Styles to your text. For this document we're going to include the Title and Heading 1 Styles, and we want these Styles to all be the same color.

1. Open the Lesson 3.Text Formatting practice file.
2. With the Home tab selected, right-click on the Title tab and choose Modify.

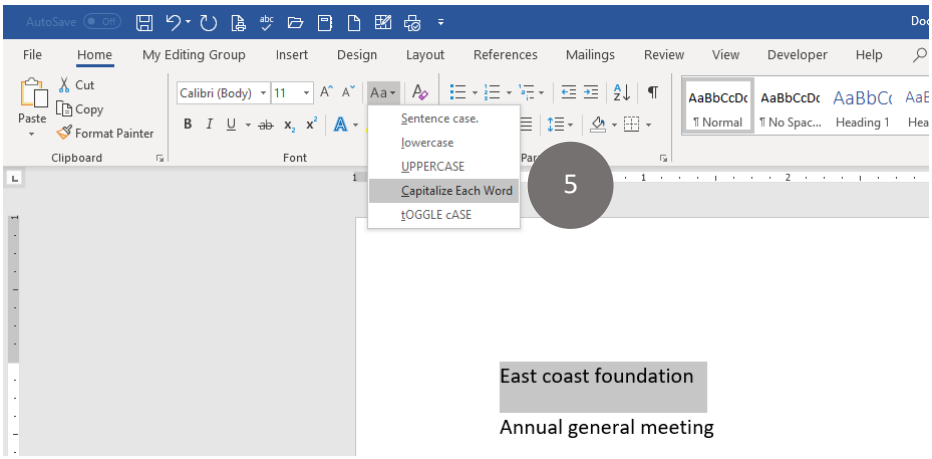


3. Under the Formatting section of the dialog box, click on the Font down arrow, and choose Black, Text 1; click OK.

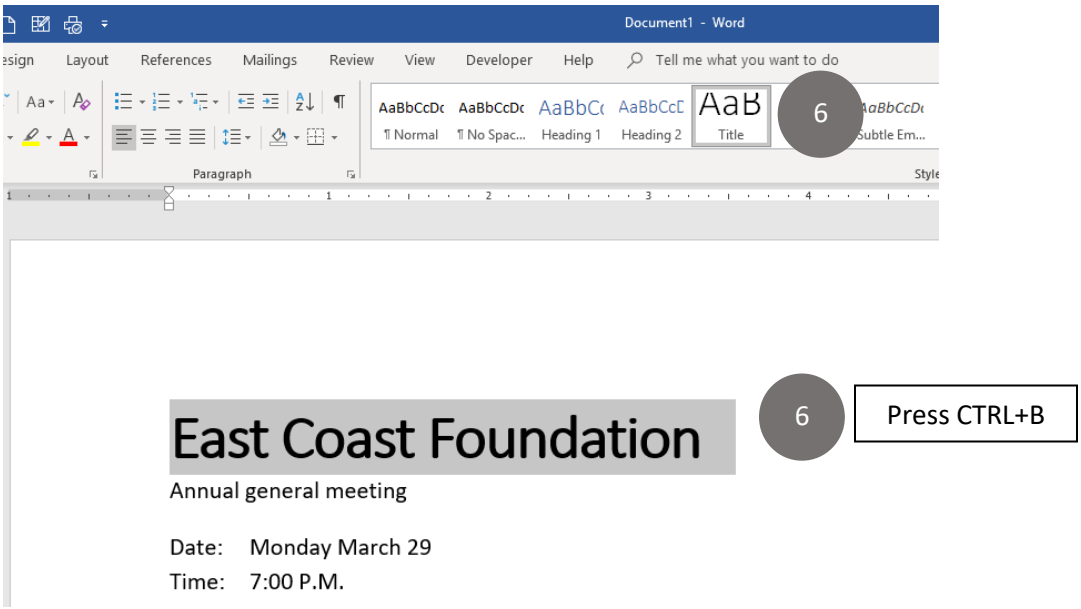


4. Repeat these steps for the Heading 1 and Heading 2 Styles.

5. Select East Coast Foundation at the top of the page. With the Home tab selected, click on the Change Case down arrow in the Font group. Choose Capitalize Each Word.



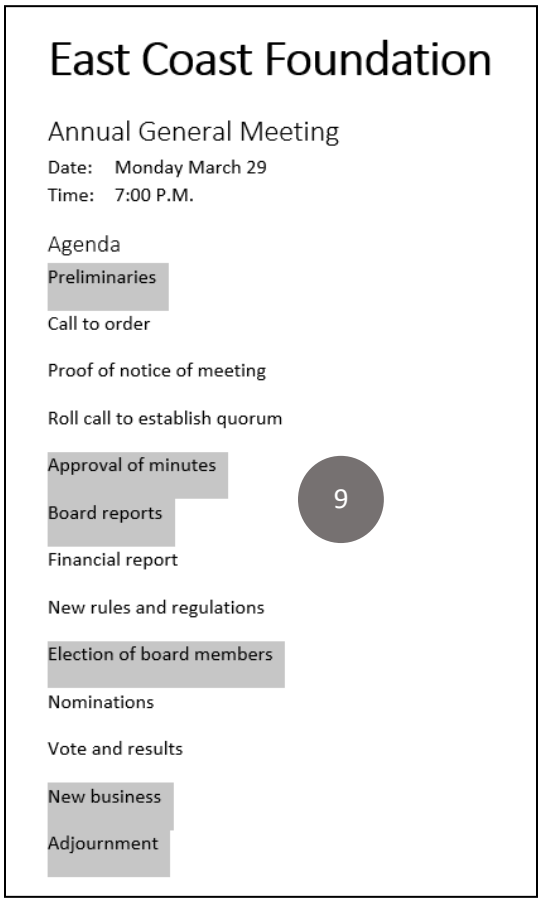
6. With the Home Tab and East Coast Foundation still selected, choose Title from the Styles group. Press the Control (CTRL) button and the letter B on the keyboard to make the text Bold.

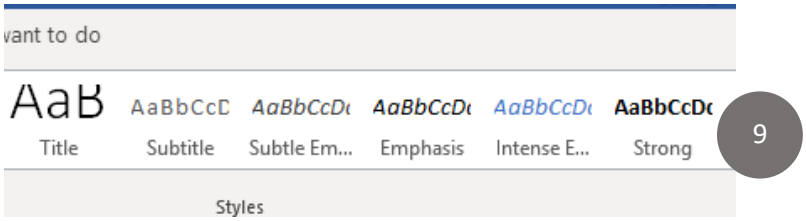


7. Select the Annual Meeting line and choose the Heading 1 style. Change the case to Capitalize Each Word like we did for the Title Style.

8. Select the Agenda line and choose the Heading 2 style For the agenda topics, we're going to use the same font size but change the way the text looks by using the Strong Style.

9. Double-click on Preliminaries; while holding down the CTRL key, select Approval of Minutes, Board reports, Election of board members, New business and Adjournment; then select the Strong Style from the Styles group.

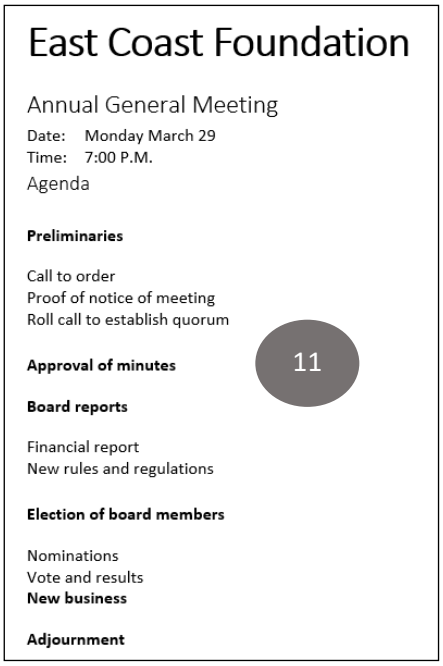




Now let's change the spacing of the topics under each agenda item.

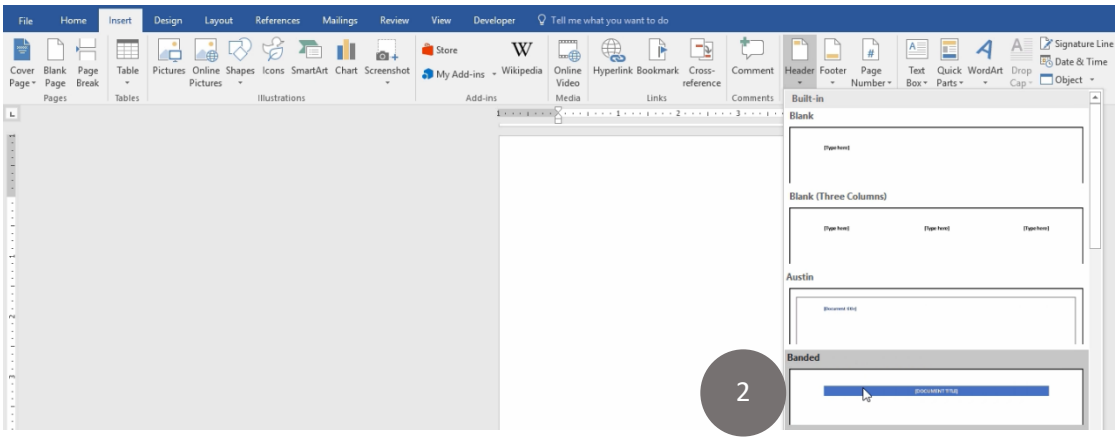
10. Select the "Date" and "Time" lines; choose No Spacing from the Styles group. Let's also Apply the No Spacing style to the three lines under Preliminaries, the two lines under Board reports and the two lines under Election of new board members.

11. The last thing we want to do is change the spacing of the topics so that everything looks consistent, so let's click in front of Approval. We only want to move it down one space, so we need to first hold down the Shift key, and then press the Enter button. Let's repeat these steps for Election of Board Members and New business.

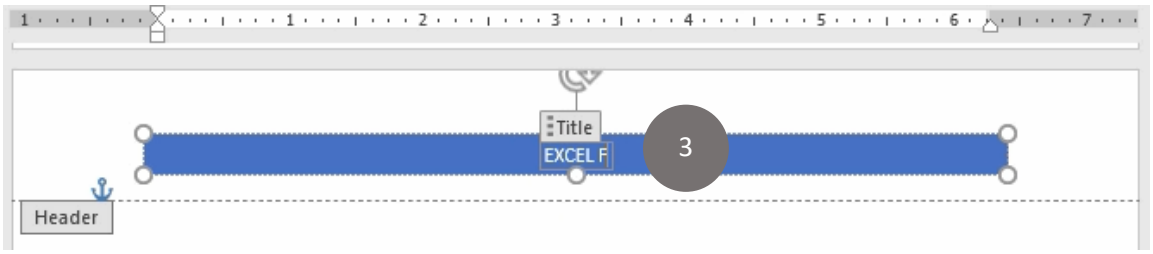


Lesson 4: Add Headers, Footers and Page Numbers

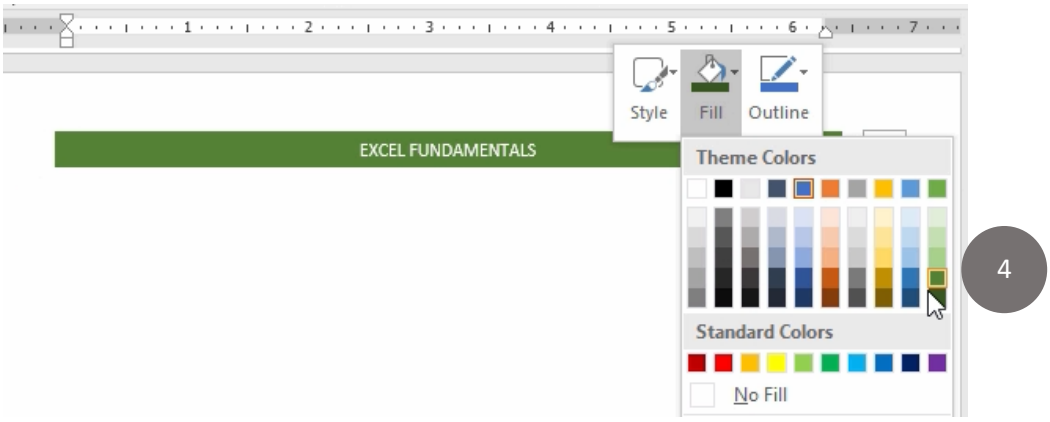
1. Open a new Word document.
2. Click on the Insert tab, then click Header; choose the Banded option.



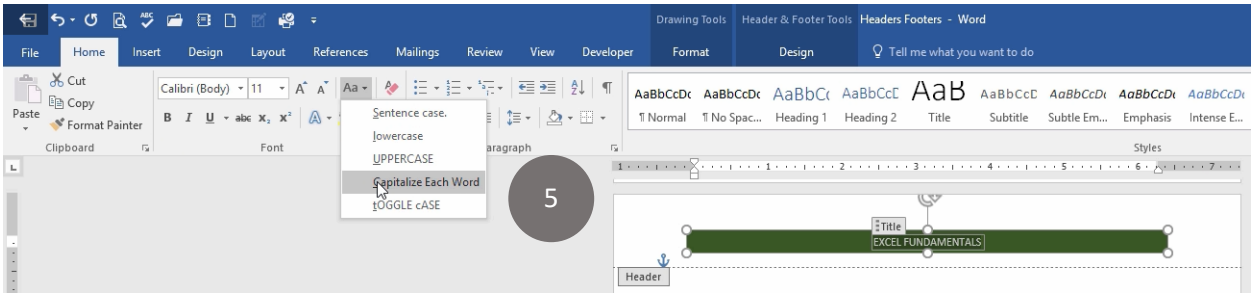
3. Click on the title placeholder and type the word "Excel Fundamentals".



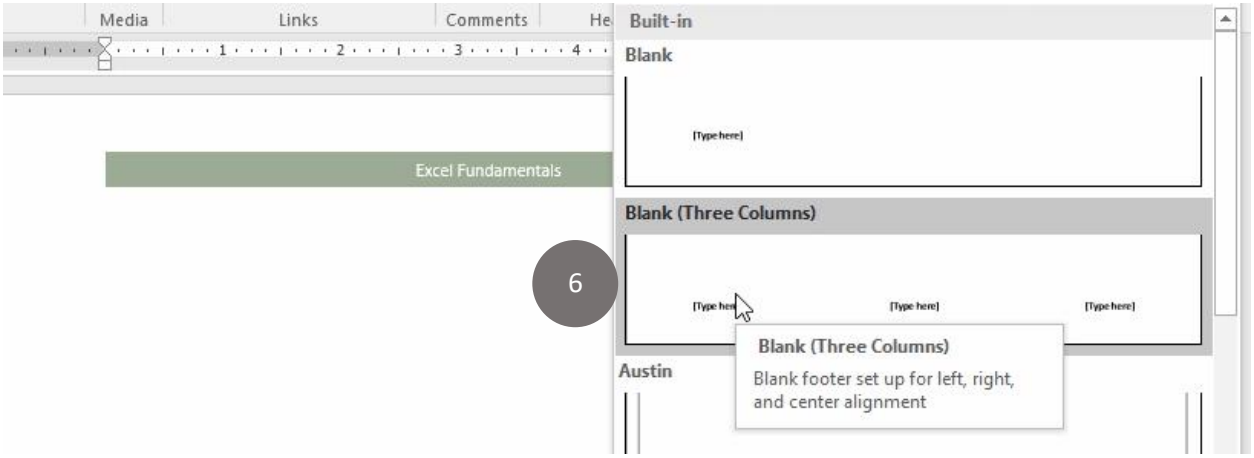
4. Right-click on the Header; click on Fill and change the color.



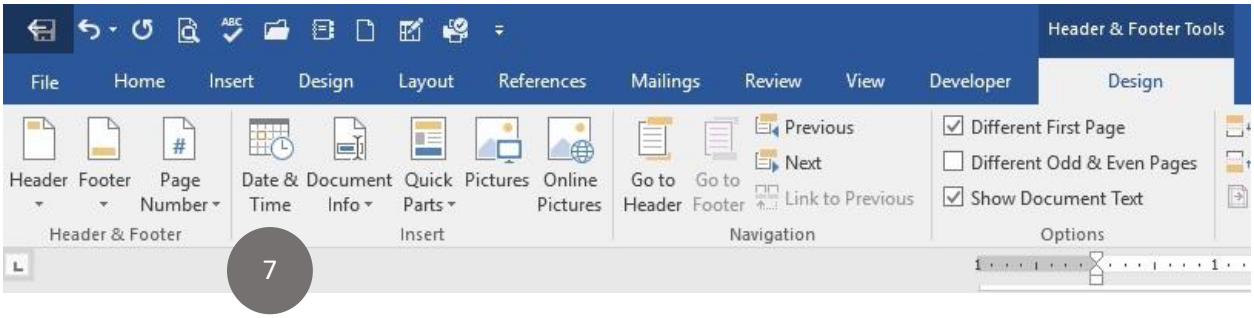
5. Let's change the font in the title from all caps to Capitalize Each Word.



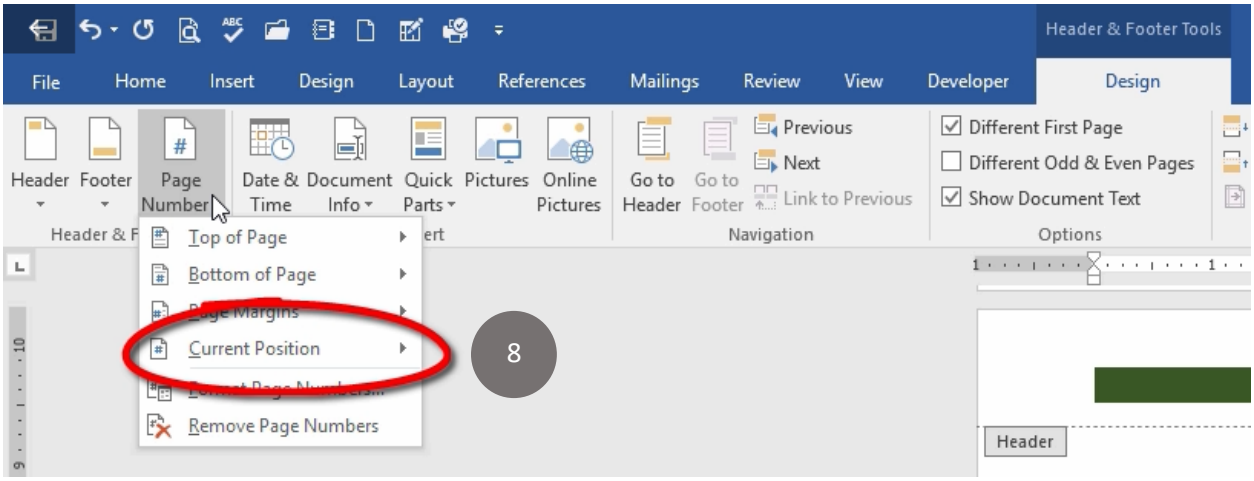
6. To insert a footer, click on the Insert tab and choose Blank (Three Column) footer.



7. Let's type a name into the left placeholder. With the Design tab still selected, click on the Date and Time button and choose one of the options; click OK.



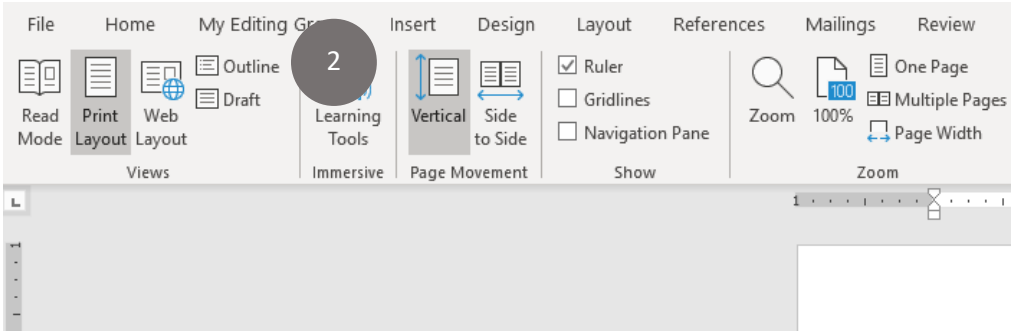
8. Click on the right placeholder. Click on the Current Position arrow.



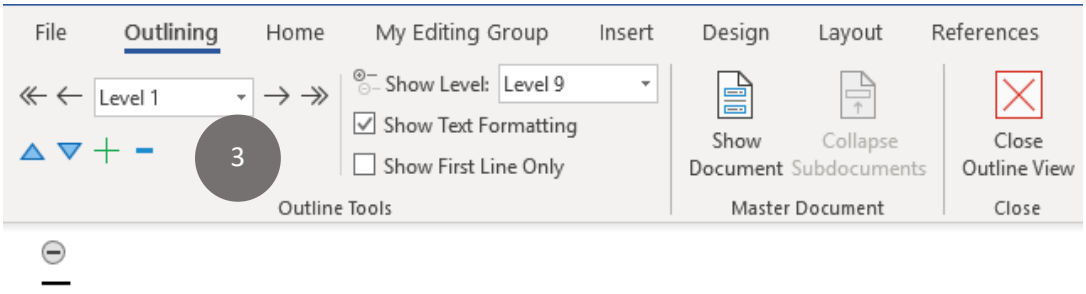
9. Choose the first option under Page X of Y: With Header and Footer tools still selected check off Different First Page (if you're using a cover sheet) and Different Odd and Even Pages (if you're printing front and back copies). Click the Close Header and Footer button.

Lesson 5: Create an Outline

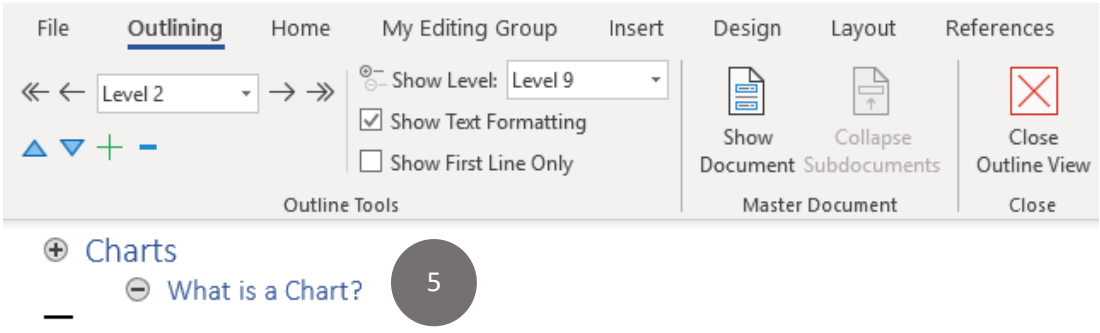
1. Open a new document or if you already have Word open, press CTRL+N.
2. Click on the View tab, then click on Outline from the Views group.



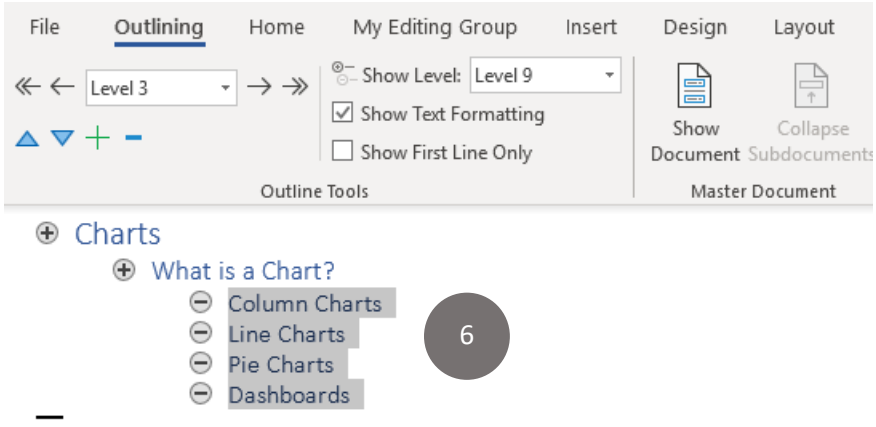
3. Select **Level 1** from the Show Level drop-down menu.



4. Type “Charts and Graphics” on the first level; press the **Enter key.**
5. Type “What is a Chart”, then press the **Tab key**; this will make the title **Level 2** on the Outline.



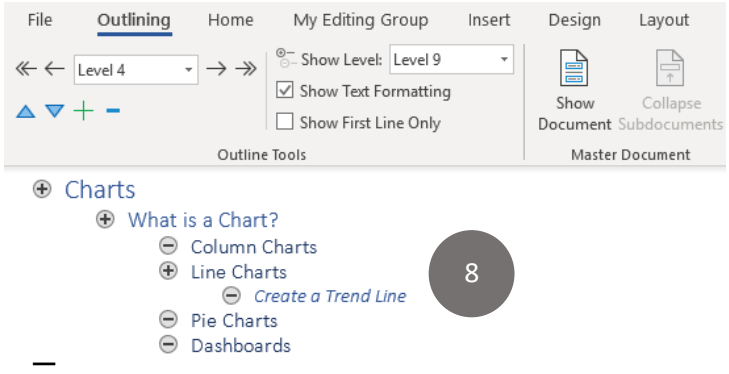
6. Type in the following, pressing the Enter key after each entry: Column Charts, Line Charts, Pie Charts, Dashboards. Select these entries then press the Tab key. The entries are now **Level 3** on the Outline.



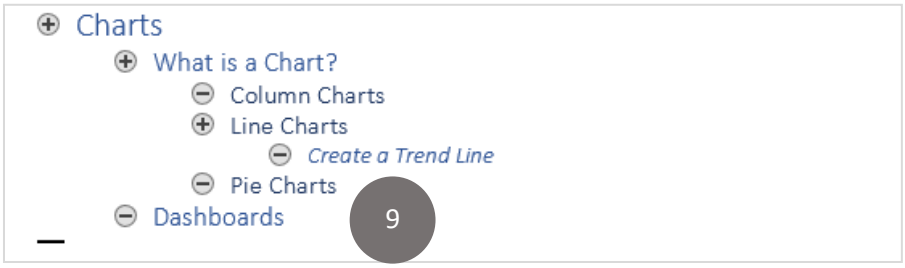
More than likely, you will make changes to the Outline as you add content. In the Outline view you can add new topics and change the level of existing topics.

7. To add a new level, click on the Outline topic **just below** the space where you want to add it; click in front of “Pie chart” and press Enter.

8. Press the Up arrow and type “Create a Trendline”, then press the Tab key. This will be **Level 4** on the Outline.



9. To change an Outline level, click in front of the level you want to change. Click in front of Dashboards on the Outline and press **ALT+SHIFT and hold it down;** then press the left arrow key to move the topic back to **Level 2.** Click on the Close Outline View button on the Ribbon.

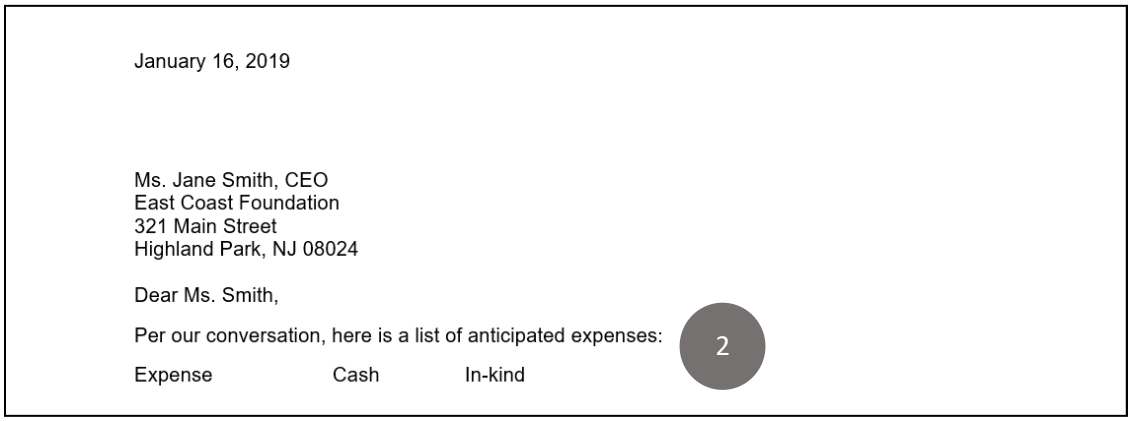


Lesson 6: Create a Tabbed List

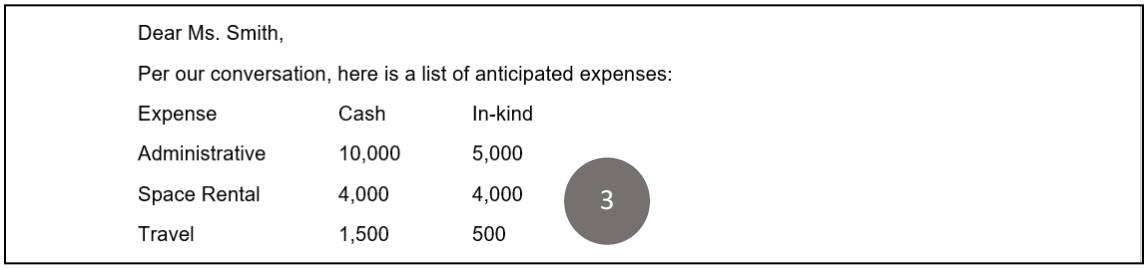
Inserting tabs in Word means that you are adding some space in between words on the same line. This is an effective way of formatting documents that include both text and numbers, because it formats them in a way that is easy for people to read and understand.

In this first example, I have a short list of expenses that consists of four lines of text. And I'll start by creating the column titles.

1. Open the Lesson 6.Tabbed List practice file.
2. Let's type the word "Expense", then press the Tab key twice to get the amount of space we need for the next column title, which is "Cash", press tab twice again and type the last title, "In-kind".

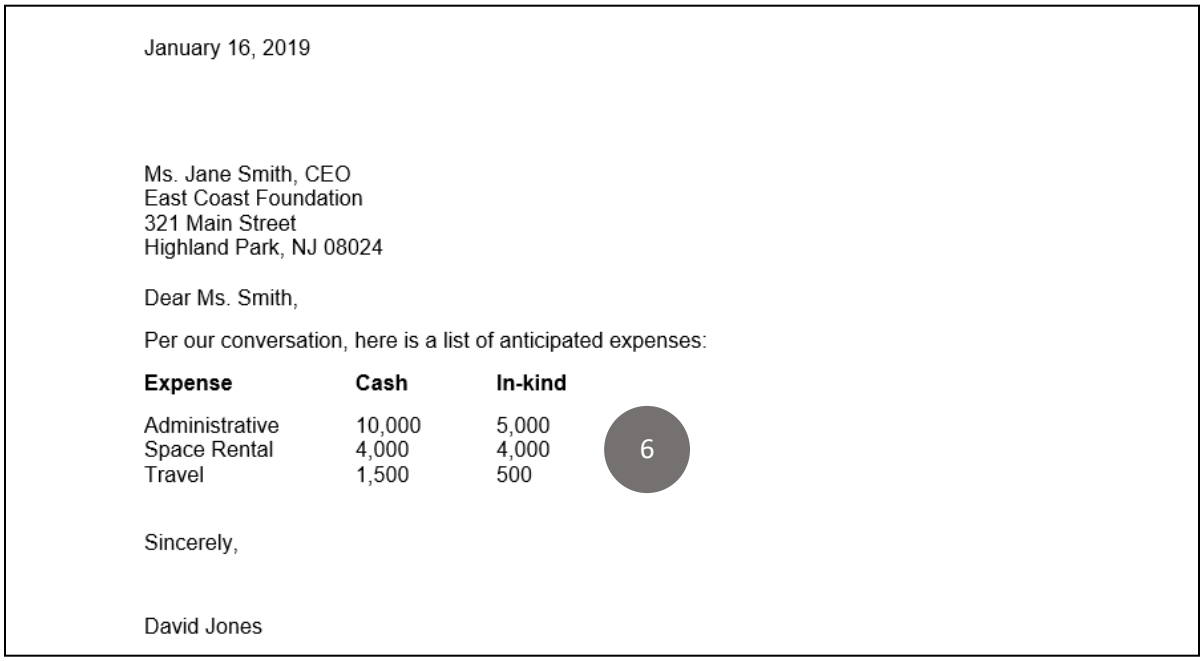


3. Press the Enter key, then finish typing in the information you want to include under each column, pressing the Tab key after each entry.



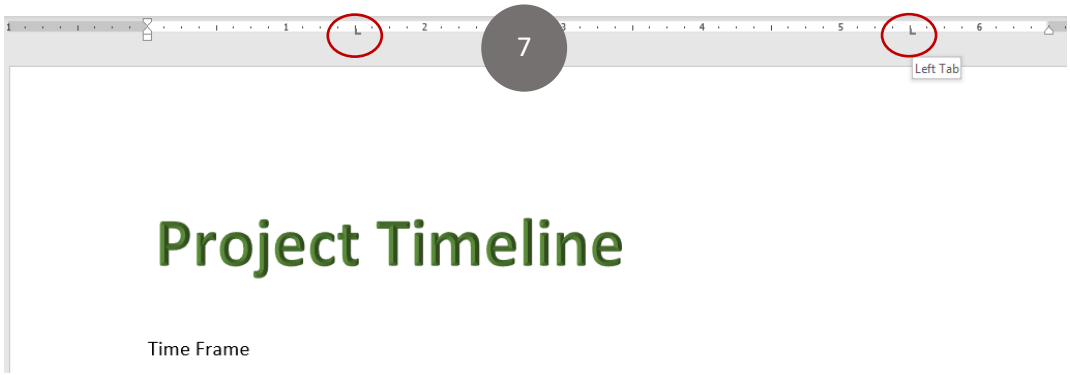
Once the tab list has been created, we change some of the formatting. In this example we want to bold the column titles, eliminate the space in between the lines and move the list a little to the right.

4. Click in front of the word Expense three times, then press CTRL+B to bold the text.
5. Select the three lines under the tab headings then click on No Spacing from the Styles group.
6. Select all four lines, then from the Home tab, click on the Increase Indent button from the Paragraph group.



In this first example, we used to default settings based on the number of times we pressed the Tab button. There are times when you want to choose the tab settings yourself because of the type of information you're typing. In this next example, you have a small amount of text that will be in the first column followed by a larger amount of text in the second column.

7. Type in the first column title, Time Frame. Instead of pressing the tab key, go to the ruler at the top of the page and click on the 1.25 position and the 5.5 position. This way, every time you press the tab key the cursor will move to those positions.



8. Type the word Details, followed by the word Due Date.

9. You can now type in the rest of the text under each column heading. Use two of the same formatting options used in the first example, which included bold text for the titles, and taking out the space in between the lines.

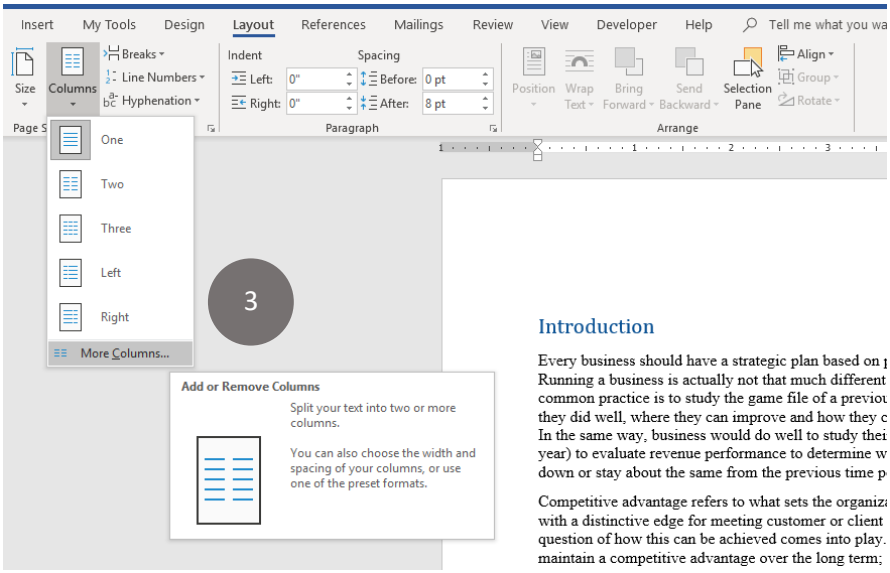
Project Timeline

Time Frame	Details	Due Date
Month 1-4	Analyze system needs, create protocols	April 1st
Month 5-7	Design system needs, website and training	July 31st
Month 8-10	Technology plan analysis, final observations	October 31st

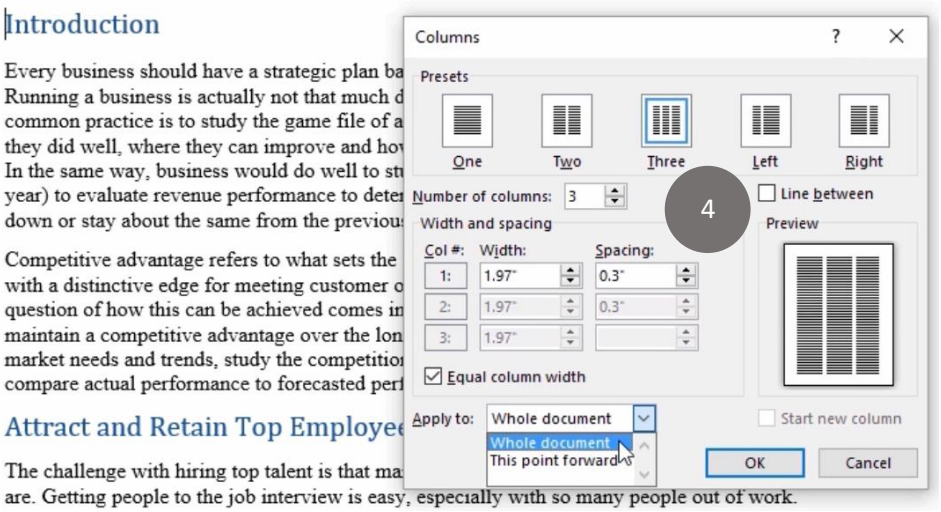
Lesson 7a: Dividing Text into Three Columns

We're going to explore a couple of different ways that text within a word document can be divided into columns, which is a commonly used format for documents such as newsletters, training manuals or employee handbooks. We'll first look at how to create a document with three columns from the Page Setup group of tools, and then we'll look at how to create a document that consists of a single column using the Paragraph group of tools.

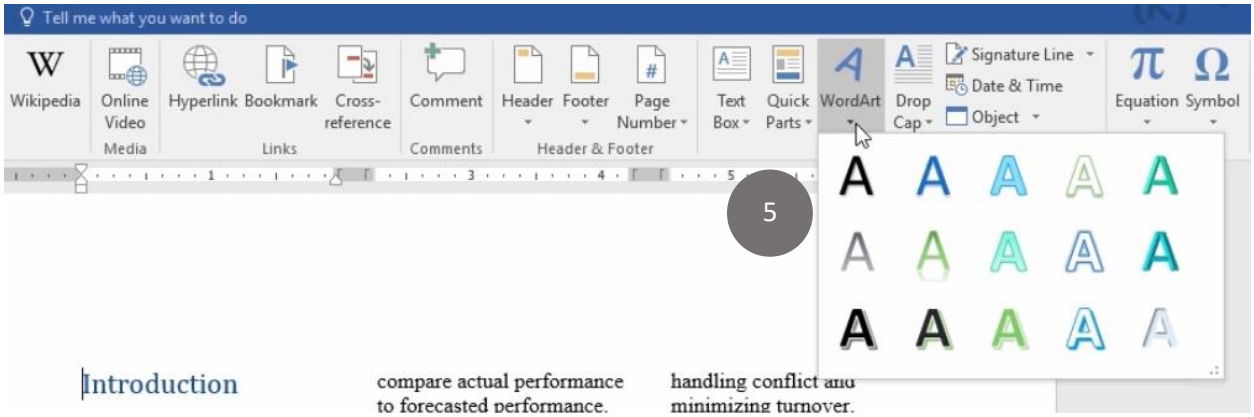
1. Open the Lesson 7a.Text into Three Columns practice file.
2. We want to add a title to this document after we've added the columns, so we can start by clicking in front of the word "Introduction" and then pressing the Enter button.
3. Click on the Layout tab, then choose the Columns drop-down and select "More columns".



4. Under the Presets section, choose Three; Number of columns 3; Spacing .3. Under Apply, choose This point forward, which means that the columns will only be formatted starting at where the cursor is currently positioned; click OK.



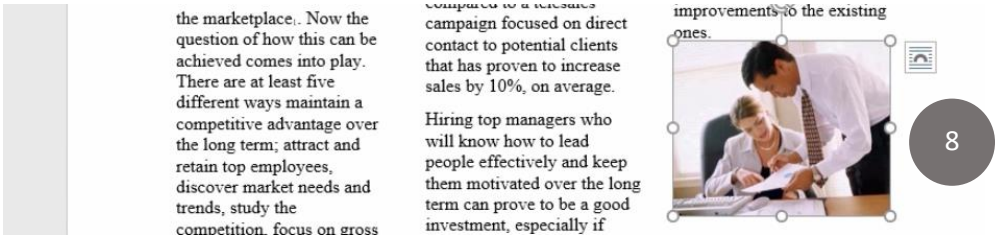
5. To add a Title, click on the Insert tab, then click on WordArt from the Text group.



6. For this document, we're going to choose Fill, Blue, Accent 1 Shadow.

7. Position the Text Box to the top of the document; press CTRL+L to left-align the text, then press CTRL+A to select it. Type the words "Our Competitive Advantage". Your document should now look like this:

8. Move the cursor to the end of the third column, so we can add a photo. Click on Insert tab, then click on the Pictures button from the Illustrations group. Choose the Office Employees photo from your hard drive. Click on one of the corners of the photo to make it a little larger.



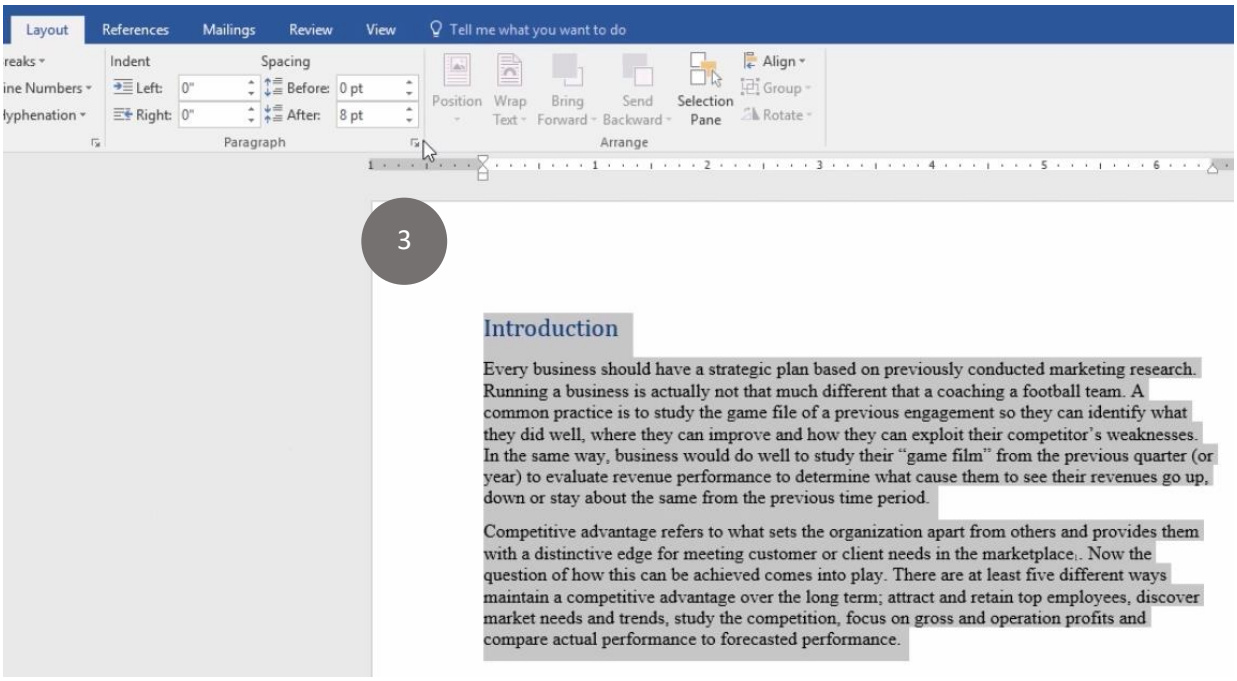
9. Right-click on the photo. Choose Wrap Text and select In Front of Text. This allows you to reposition the photo anywhere in the document; you may need to position the photo a little lower.

10. To add a caption to the photo, we're going to right-click on the photo and choose Insert Caption. Let's keep all the default settings and just click OK.

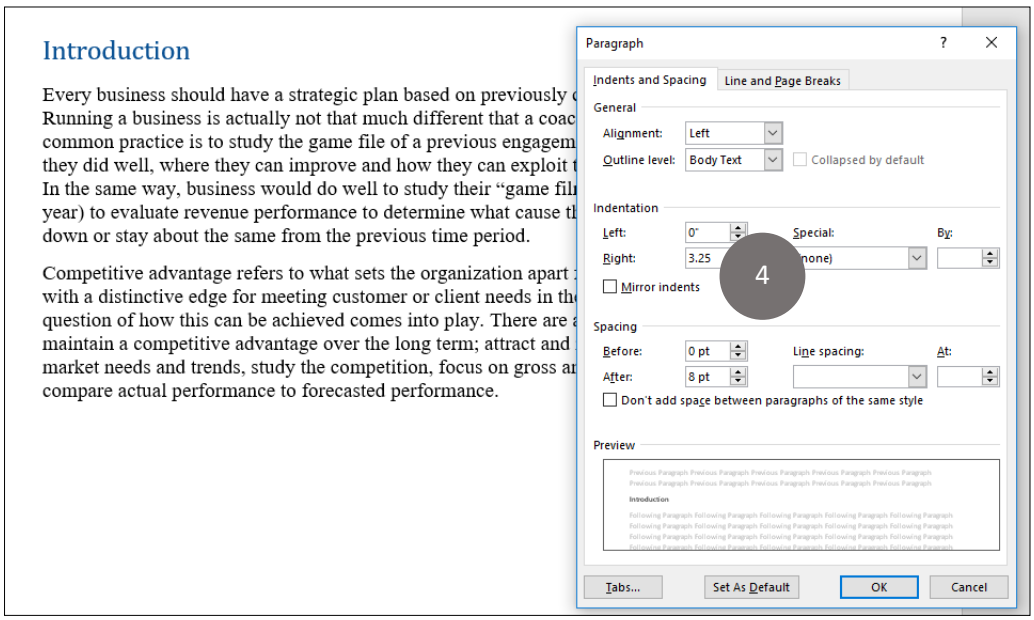
11. To write a caption, first select it. The default for the text is written in italics; to change this, press CTRL+I, then type the words "We Need Teamwork!"

Lesson 7b: Dividing Text into Two Columns

1. Open the Lesson 7b.Text into Two Columns practice file.
2. To create the format for this, we need to first select all the text by pressing CTRL+A.
3. From the Layout tab, click on the Launcher button in the Paragraph group.



4. Under Indention, select the number next to where is says "Right:"; input 3.25, then click OK.



5. Insert the Office Workers photo. This time, we want to adjust the position of the photo, so it aligns with the text, so right-click on the photo and choose Wrap Text.

6. Choose the “Tight” alignment type so that the text wraps around the picture; click OK.

You can control the amount to space there is between the text and the picture and in many cases, it needs to be adjusted so that the document doesn’t look too congested.

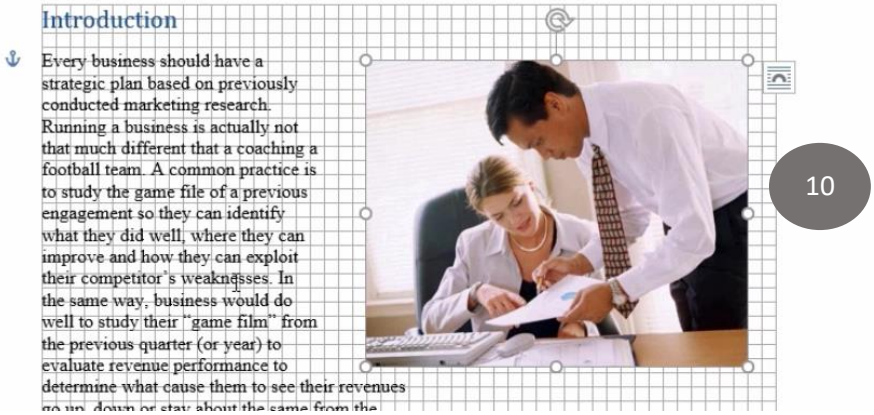
7. Right-click on the picture and choose More Layout Options.

8. Under Distance from text, increase the space between the text on the left side of the document and the picture by choosing .4; click OK.

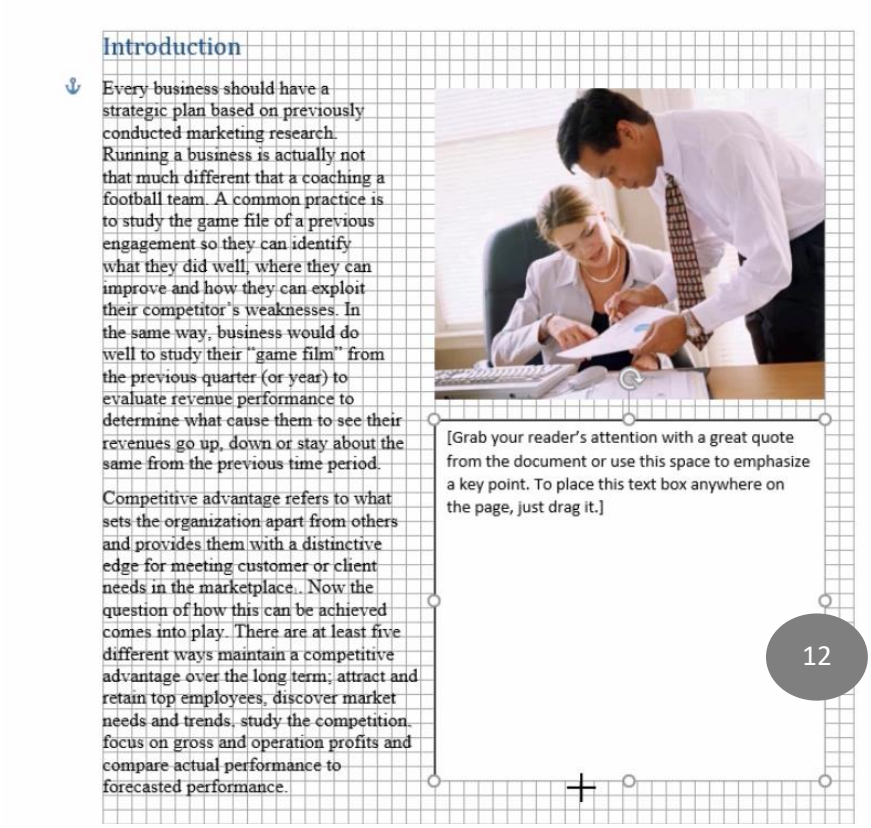
Aligning pictures and other objects within a Word document is made a lot easier when you use the Gridlines option. Let’s see how this works by inserting a Text box directly underneath the Picture.

9. To turn on the Gridlines, click on the View tab and check off Gridlines from the Show group.

10. Resize the picture so that it is positioned direct on the Gridlines.



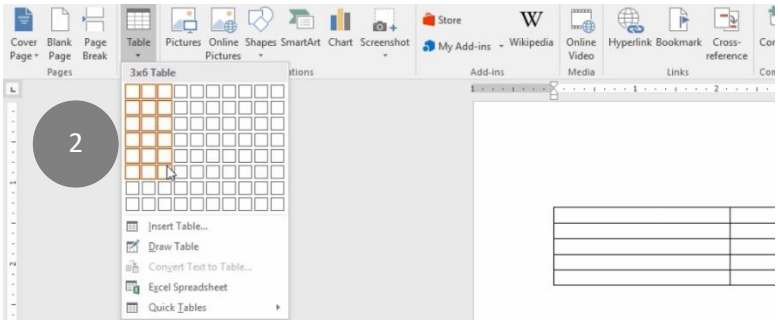
11. Then click on the Insert tab and choose the Simple Text Box from the Text group.
12. Align the Text Box directly beneath the Picture. Then extend the length of the Text Box so that it aligns directly with the end of the first paragraph on the left side of the document.



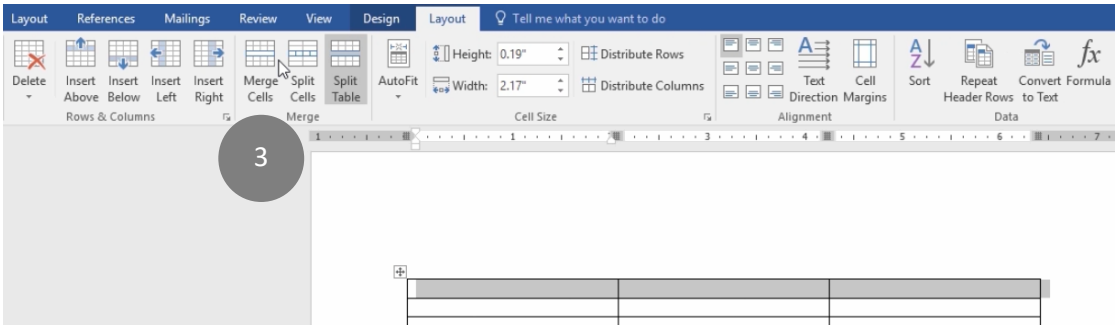
Lesson 8: Creating Tables

A table in Word can be described as a way to organize data into columns and rows, as opposed to typing text and numbers into one or more paragraphs.

1. Open a new Word document.
2. Click on the Insert tab, then click on the Table button down arrow from the Tables group; choose a 3x6 table.



3. Select the first **row** of the table; from the Layout tab under Table Tools, click on Merge Cells from the Merge group.

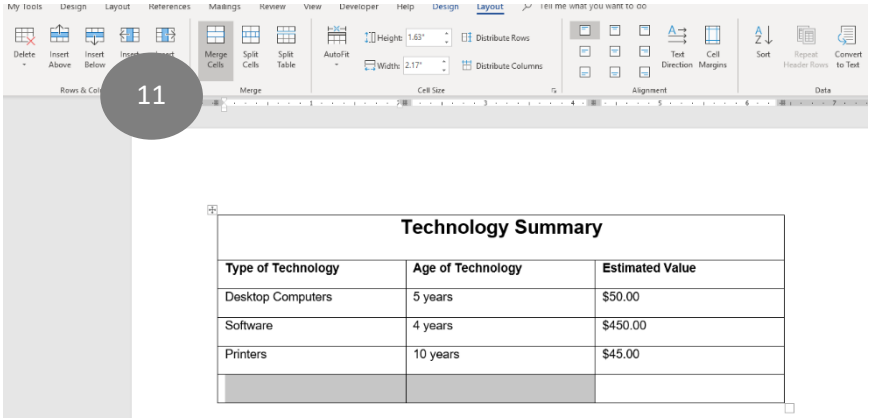


4. With the Merged cell still selected, click on Align Center from the Alignment group.
5. Type the words “Technology Summary”.
6. Left click on the first row three times to select it; right click to change the font size to 16.
7. In the first cell in the **second row**, type the word “Type of Technology”, then press the Tab key.
8. Type the words “Age of Technology” press the Tab, then type “Estimated Value”.
9. Select the second row in the Table and press CTRL+B to bold the text.
10. Type the follow information into the third, fourth and fifth rows:

Technology Summary		
Type of Technology	**Age of Technology**	**Estimated Value**
Desktop Computers	5 years	$50.00
Software	4 years	$450.00
Printers	10 years	$45.00

10

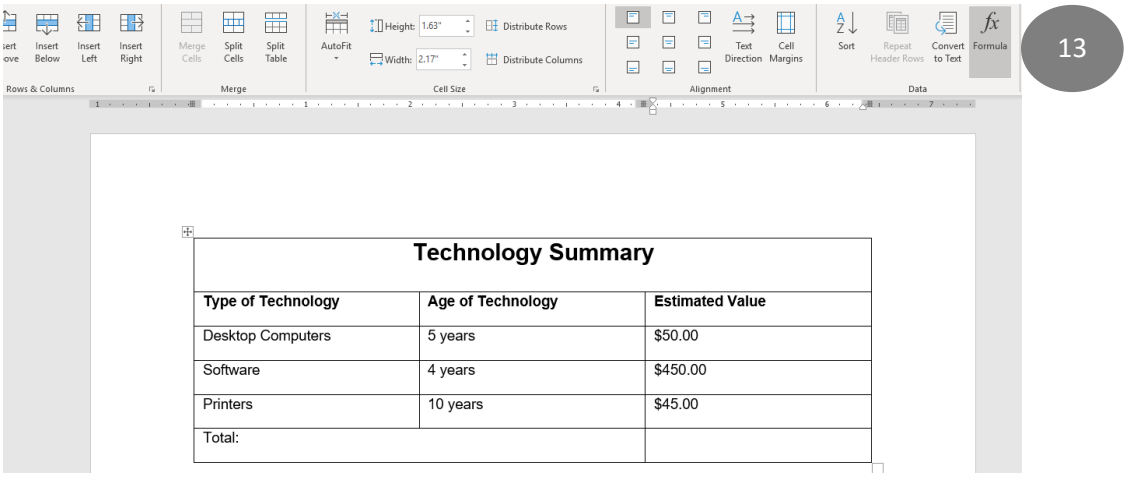
11. Select the first two columns in the last row. With the Layout tab selected, choose Merge Cells.



Technology Summary		
Type of Technology	**Age of Technology**	**Estimated Value**
Desktop Computers	5 years	$50.00
Software	4 years	$450.00
Printers	10 years	$45.00

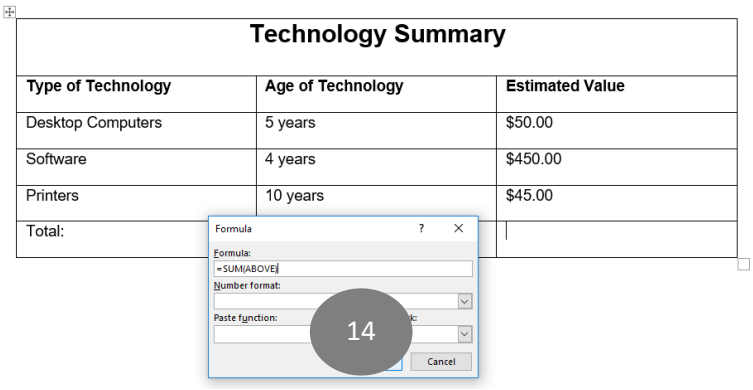
12. Type the word “Total” in the first column of the last row.

13. Click on the last column in the last row; from the Layout tab, choose Formula from the Data group.



Technology Summary		
Type of Technology	**Age of Technology**	**Estimated Value**
Desktop Computers	5 years	$50.00
Software	4 years	$450.00
Printers	10 years	$45.00
Total:		

14. Under formula, keep the SUM(Above) option, which will add all the numbers from the first five columns in the last row; under Number format, choose the set of characters that start with the dollar sign, click OK.



15. Click on the Table; under the Design tab, choose the Grid Table 1 Light Accent 6 style.

16. Click on the Layout tab under Table Tools; under the Rows and Columns group, click on Insert Below button to add another row. Type the word Total in the cell. The Table should now look like this:

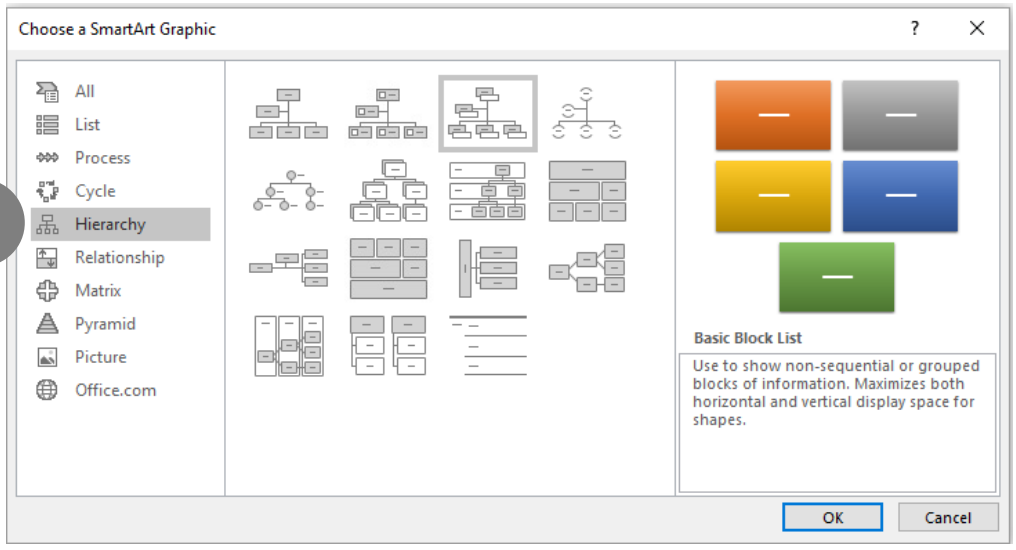
Technology Summary		
Type of Technology	**Age of Technology**	**Estimated Value**
Desktop Computers	5 years	$50.00
Software	4 years	$450.00
Printers	10 years	$45.00
Total:		$ 545.00

Lesson 9: Create SmartArt Graphics

This lesson will cover how to create SmartArt graphics into a Word document, SmartArt graphics can be used to illustrate a variety of different concepts, such a cycles, processes and relationships.

In this lesson I'm going to use the example of an organization that is putting together a written plan for implementing a new computer system, and we're going to create two different types of SmartArt graphics; an organization chart that shows the names of everyone on the planning committee, and a project timeline graphic that illustrates the steps needed to complete the project.

1. Open a new Word document.
2. Click on the Insert tab and choose SmartArt.
3. Click on the Hierarchy option and choose Organization Chart; let's choose the name and title option.



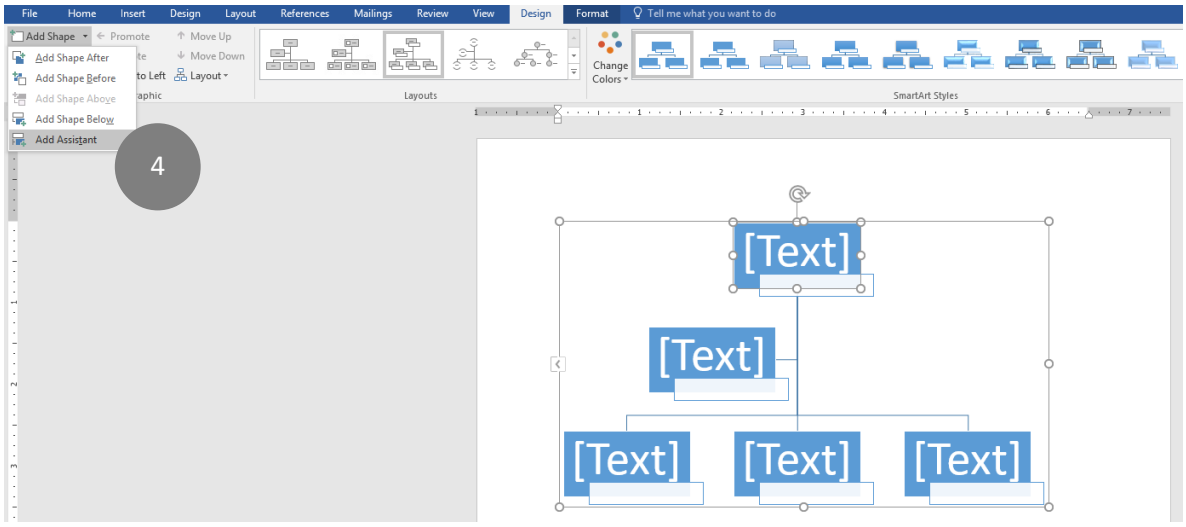
3

Here are the names that will be included in the Organization Chart:

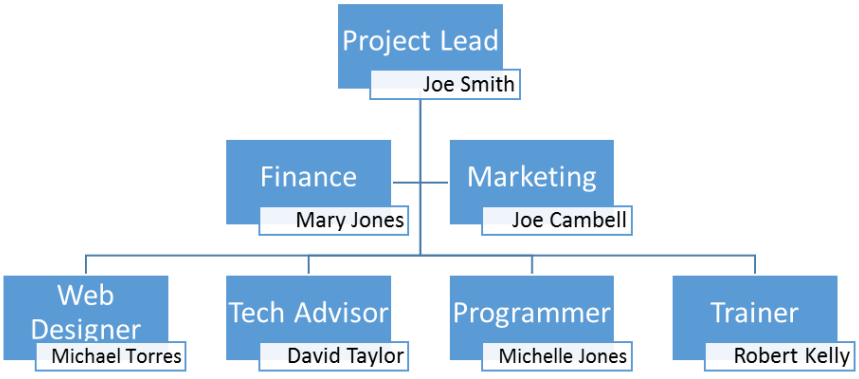
Project Lead	Joe Smith
Finance	Mary Jones
Marketing	Joe Campbell
Web Designer	Michael Torres
Tech Advisor	David Taylor
Programmer	Michelle Jones
Trainer	Robert Kelly

The default setting for the Name and Title Organization is five spaces but there a total of seven people on the planning committee, so we need to add a couple of shapes. The first shape we're going to add is a shape called an Assistant.

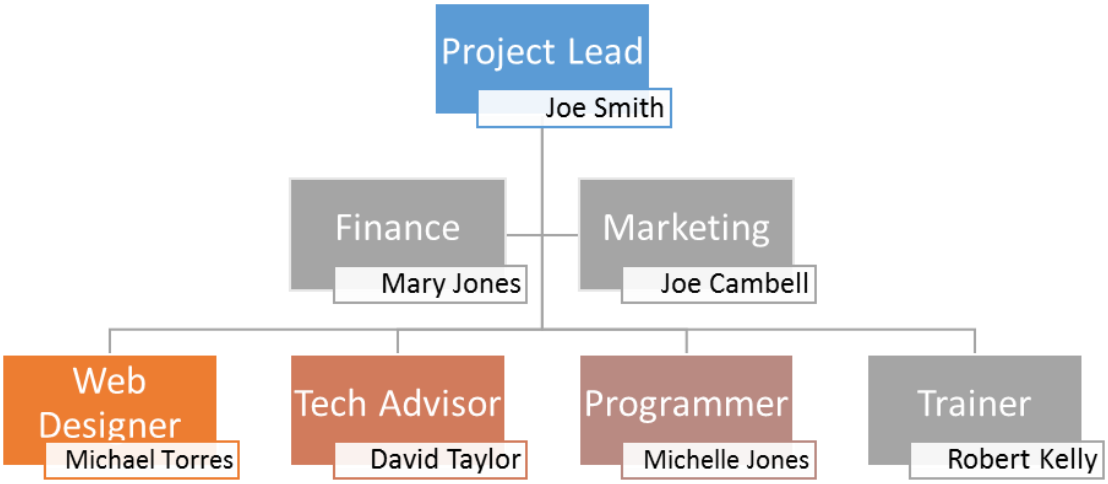
4. Click on the first shape at the top of the graphic, click on the Design tab, then click on the add shape down arrow and choose Assistant.



5. Click on the last shape on the right, Design tab, Add Shape, then choose Add Shape Before. Click on the shape, which opens up something called a Text Pane, where you can type in the names and titles for each shape; however, you will find it easier to simply click on the left or right side of each shape and start typing in the information.

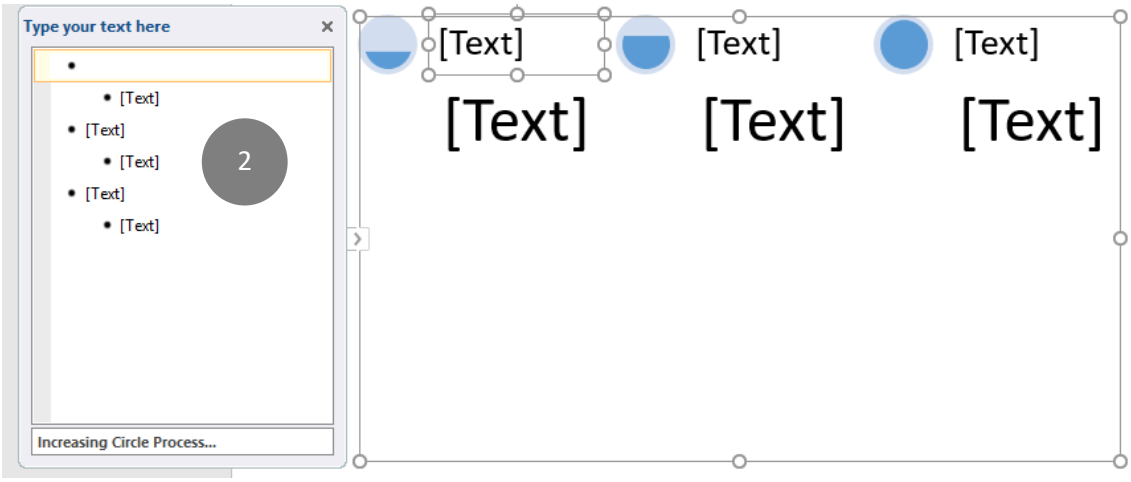


6. After you've finished entering the names and titles, you can change the color of the organization chart by clicking on the graphic and choosing Change Colors from the Design tab and choose the first option under Colorful.



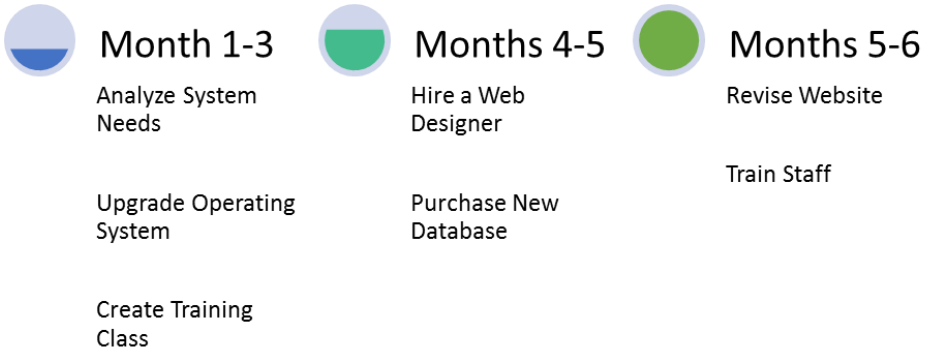
Create a Project Timeline Graphic

1. Open a new Word document.
2. Create a Process Timeline by choosing Process, then choose Increasing Process. After the graphic is inserted, **use the Text pane** enter the text.



3. Create the following Timeline by following these steps:

    a. Input the first title
    b. Press the Down arrow on your keyboard
    c. Type in the first bullet, the press the Enter key twice
    d. Add the remaining bullets, pressing the Enter key after each entry
    e. When finished, press the Down arrow key to get to the next heading



Lesson 10: Create a Pie Chart

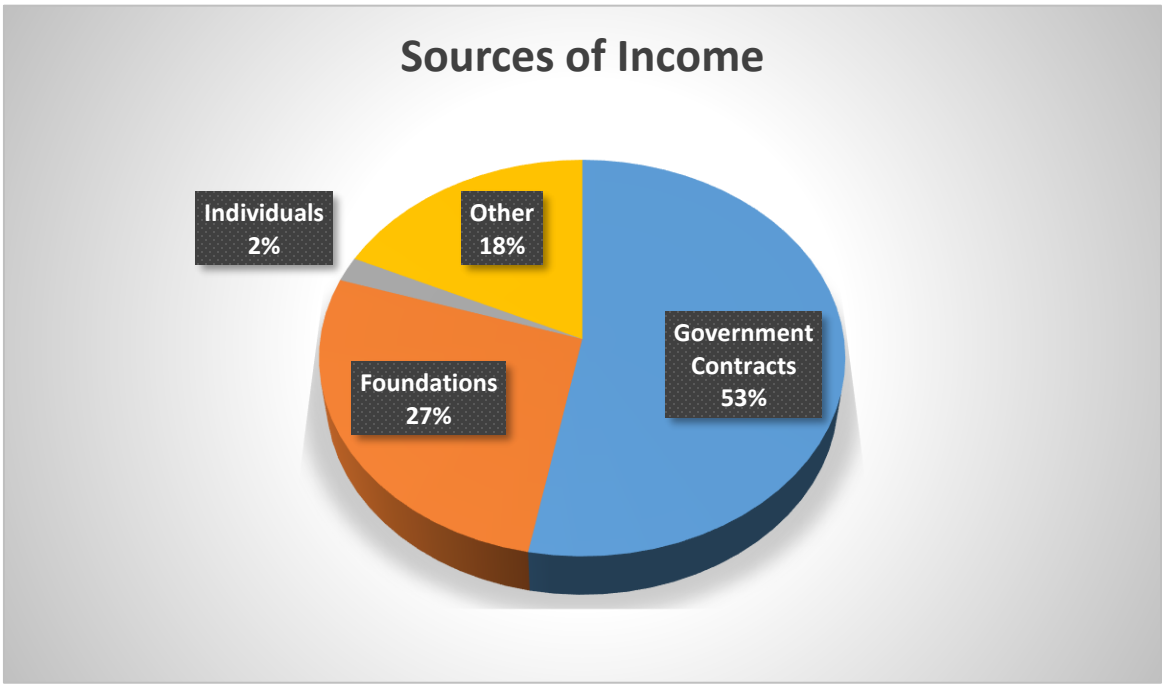
1. Open a new Word document.
2. Click on the Insert tab; click on the Chart button from the Illustrations group.
3. Choose Pie, then 3D Pie Chart; click OK.
4. Type over the text and numbers with this information:

Government Contracts	$53,000
Foundations	$27,000
Individuals	$2,000
Other	$18,000

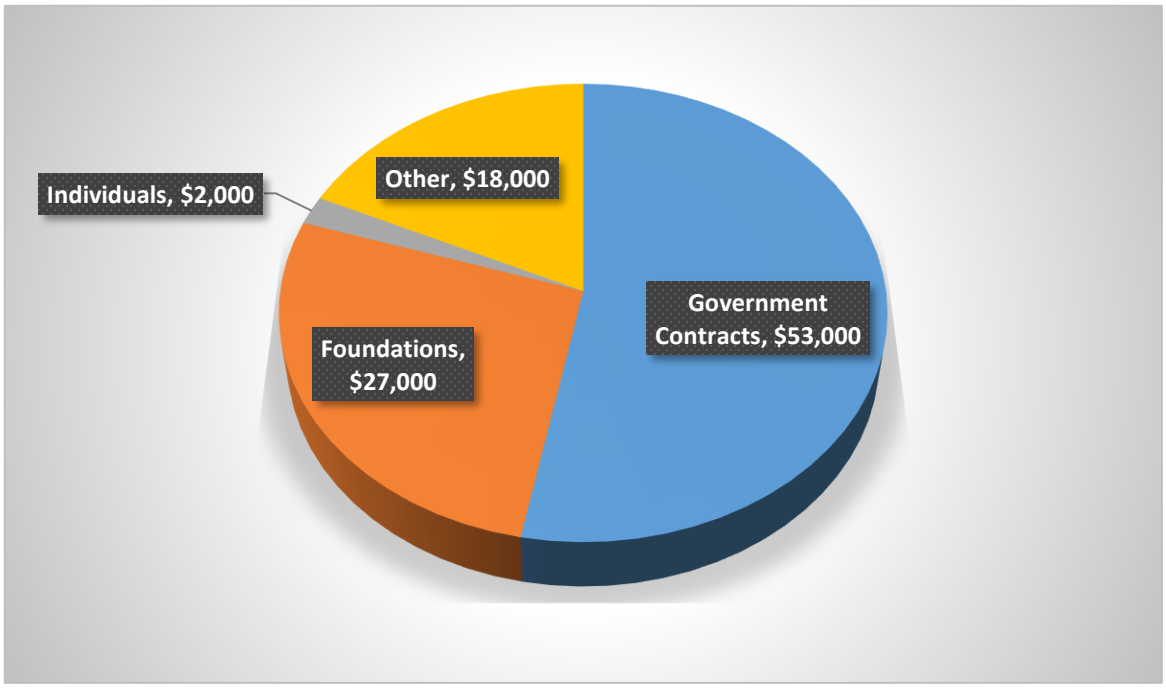
5. Change the Chart title to “Sources of Income” (Replace the word “Sales”).
6. Click on the chart. With the Design tab selected, do the following:

    a. Choose Chart Style #3
    b. Choose Quick Layout #1

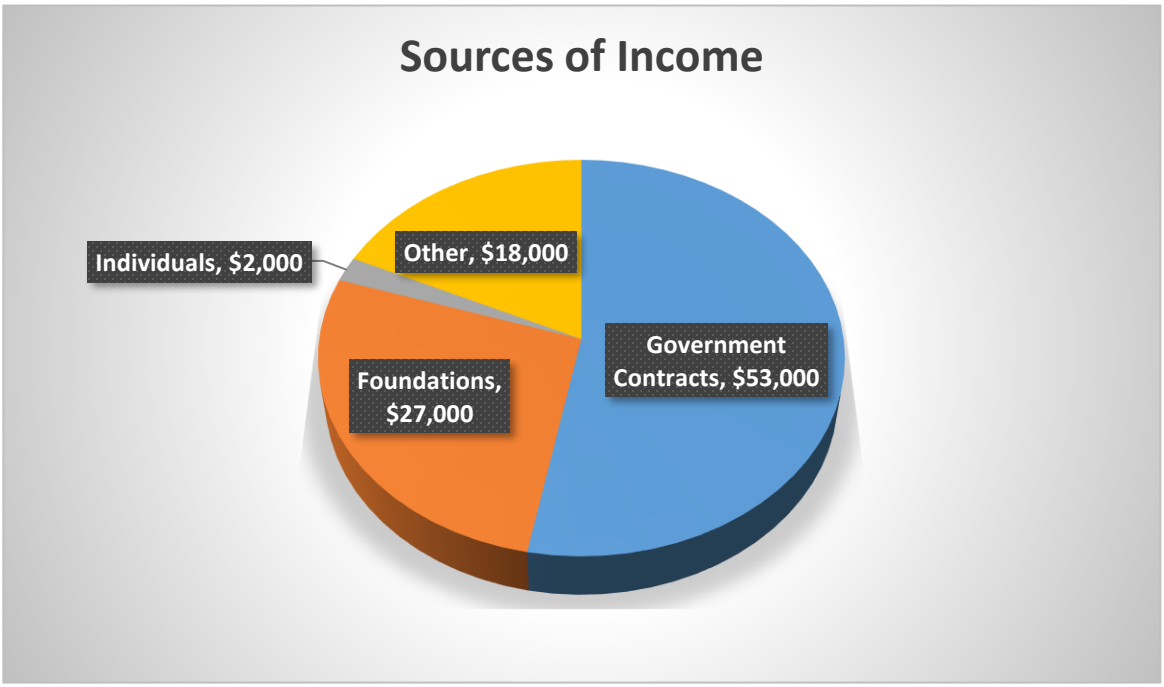
The chart should now look like this:



The chart shows a percentage breakdown; let's choose a dollar amount breakdown by first clicking on the chart and then choosing Quick Layout #4:



7. Add the title back to the chart by clicking on Add Chart Elements and choosing Chart Title, Above Chart.



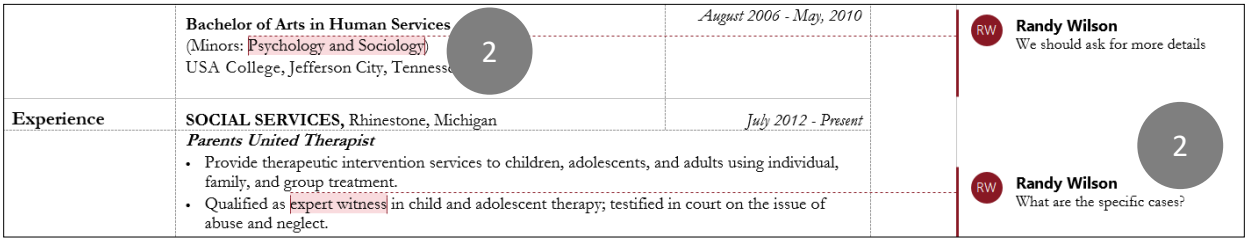
8. Right-click on the **upper right corner** of the chart, choose **Wrap Text,** then choose **In Front of Text.** This allows you to resize and move the chart as needed.

Lesson 11: Comments and Track Changes

Comments is another group of tools you can use to save time when sharing and editing documents with others. In this example, you and two other employees will carefully evaluate a resume and then think of at least five questions the group would like to ask the job candidate.

1. Open the Lesson 11.Comments practice file. Select the words “Psychology and Sociology” Click on the Review tab to display the Comment group and choose New Comment.

2. Type the words, “We should ask for more detail”. Ask a second Comment for the words “expert witness”.



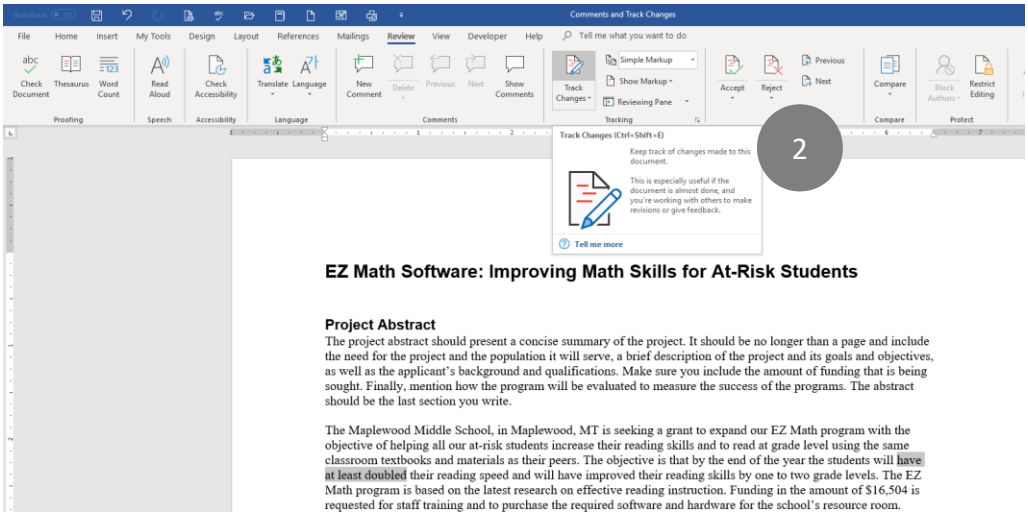
3. When the document is shared with others, they can click on the Reply options and input their responses to your comments or click on Resolve if the comment is no longer important.

Track Changes

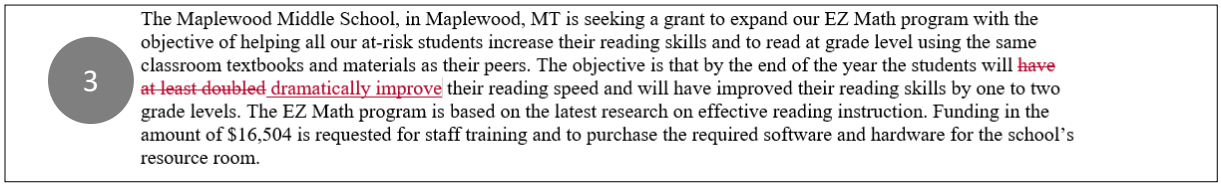
The tools in the Track Changes group are used to help groups of workers edit documents they’re working on together, such as a proposal, a newsletter or a training document. Let’s look at a grant proposal that needs to be approved before being sent to people outside the organization.

1. Open the Lesson 11.Track Changes file. Click on the Review tab to display the Comment group.

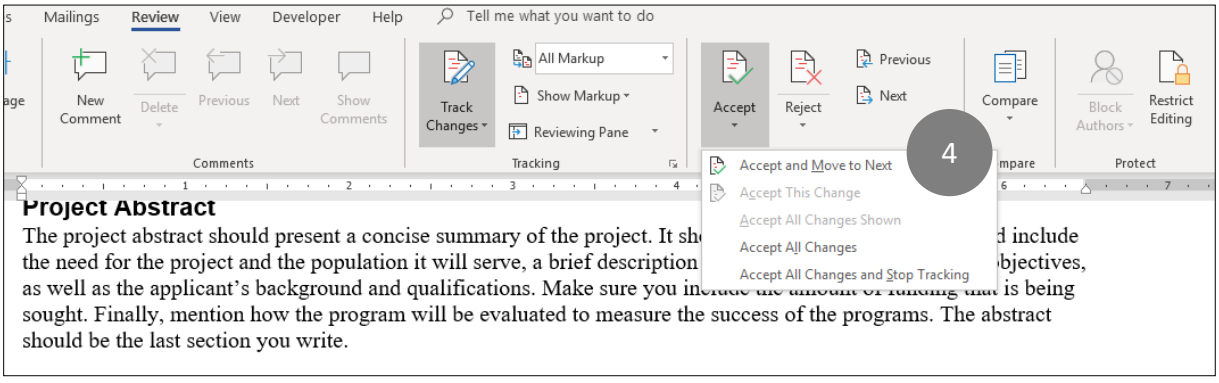
2. In the second paragraph, select the words, “have at least doubled”, then click on the top-half of the Track Changes button (or press Ctrl+Shift+E).



3. Input the words, “dramatically improve”.



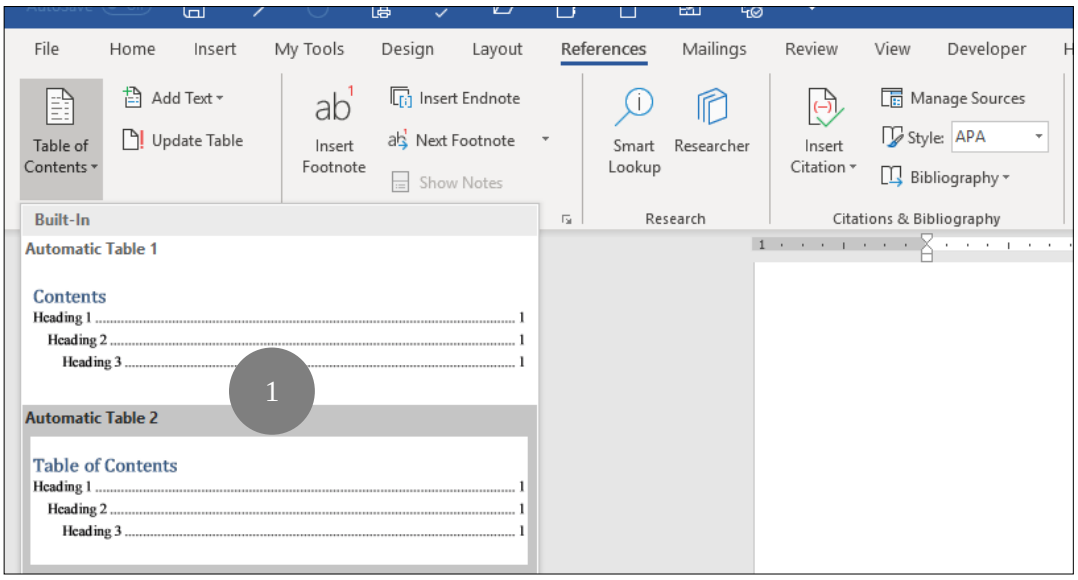
4. Continue to make changes to the document as needed. When the person who created the document receives it back with the changes, they can select one of the options from the Accept or Reject drop-down buttons from the Changes group.



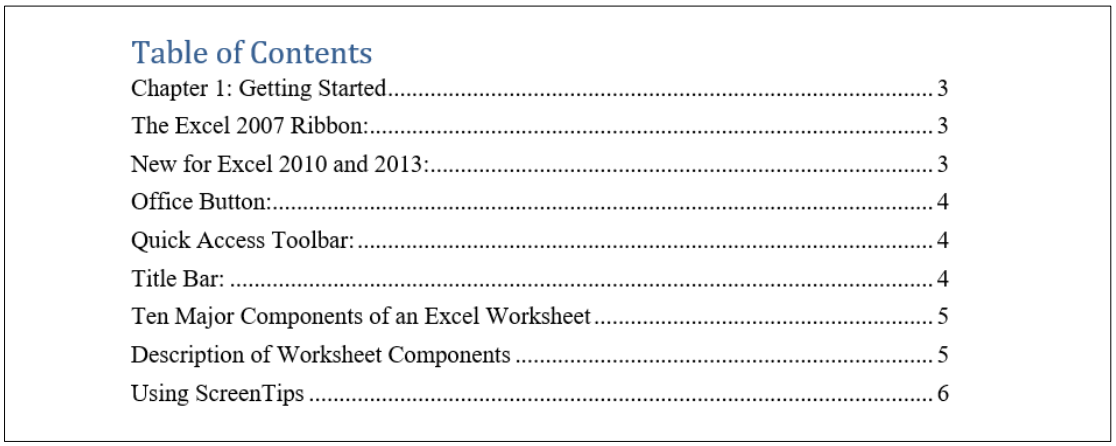
Lesson 12: Create a Table of Contents and Index

Before you add a Table of Contents to a Word document, it must have the titles of each section formatted with a Heading Style (Heading 1, Heading 2, etc.). See Lesson 3 on Text Formatting for instructions on how to do this.

1. Open the Lesson 12.Table of Contents and Index practice file. Click on the References tab, then click on the Table of Contents drop-down list and choose Automatic Table 2.

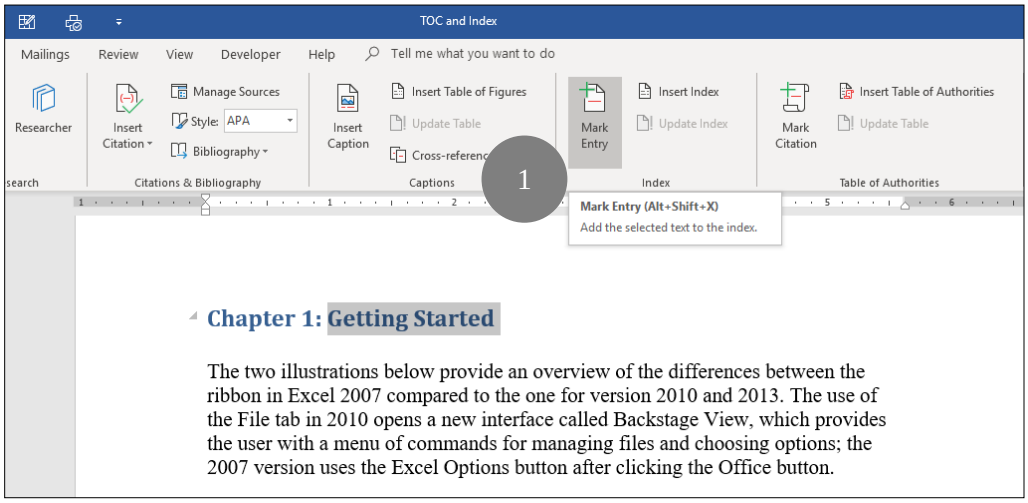


2. The Table of Contents will automatically be inserted.



Create an Index

1. An Index can be created by choosing one or more key words within the document that you want to have included. Click on the Reference tab, and then select the words “Getting Started”. Click Mark Entry (or press the ALT+Shift+X keys).

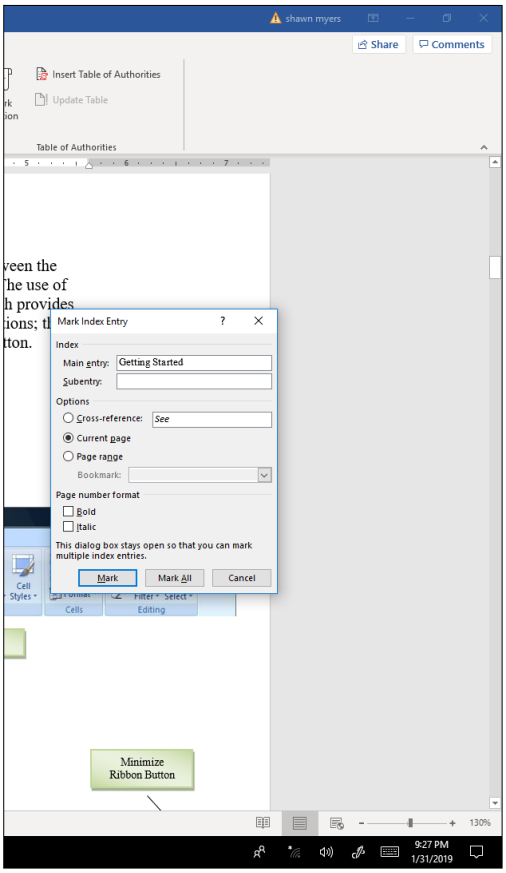


The Mark Index Entry dialog box will appear; choose from the following options listed below.

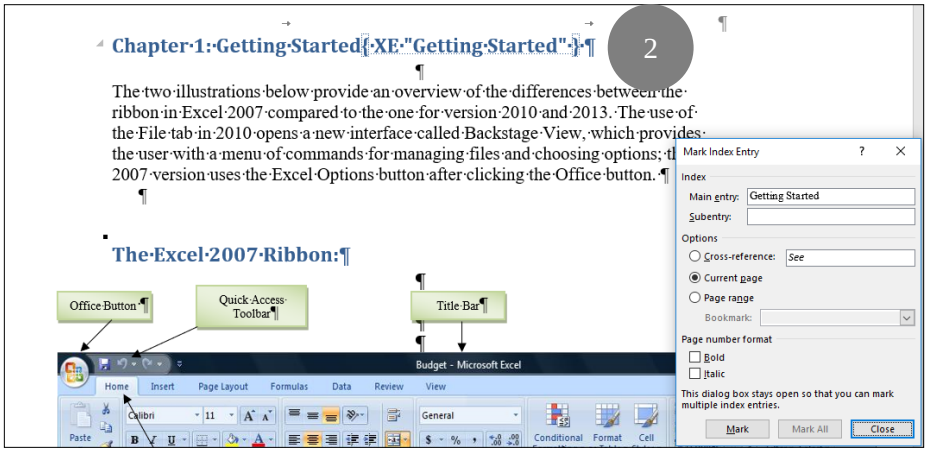
Main Entry – can use the same word as it currently appears in the document or change the text to something else.

Cross Reference – an entry here will input text (cross reference) instead of a page number, such as “*See Formulas and Functions*”.

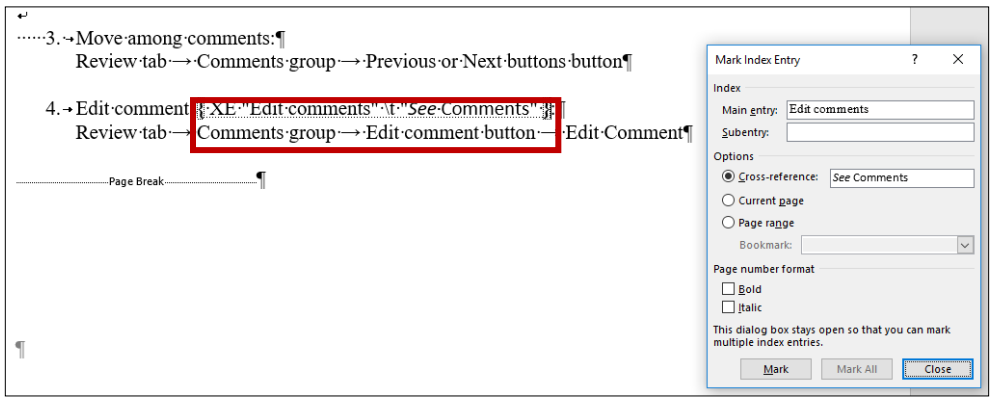
Mark or Mark All – Mark will only add the current page to the Index; Mark All will list all pages in the document in the Index that match the same case as the Main Entry.



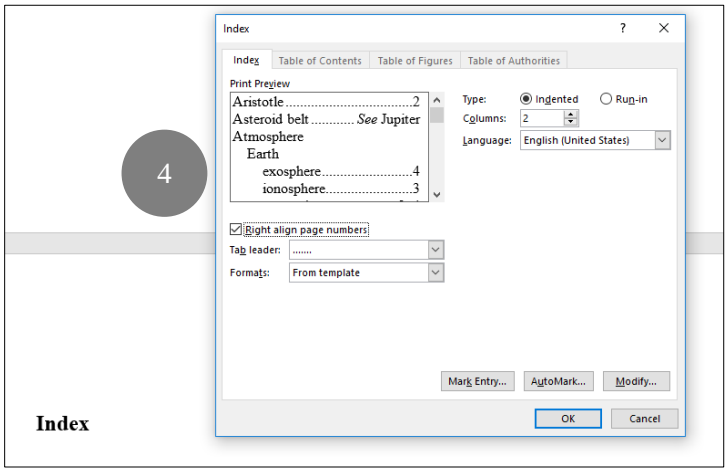
2. For this first example, let's use the main entry and choose Mark. You'll see the letters XE appear in brackets next to the Index entry.



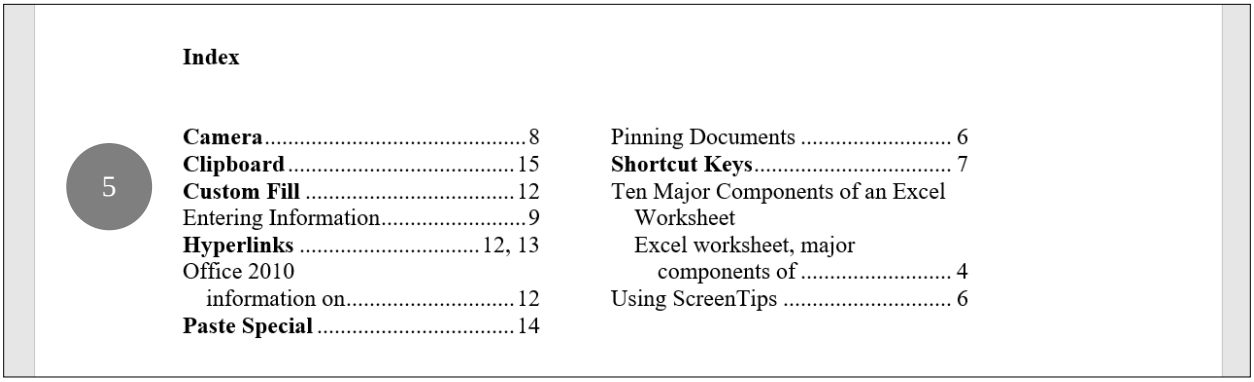
3. Continue to identify all the words and phrases you want to have included in the Index. Here's an example of a Cross-Reference entry.



4. When finished, go to the last page on the document and insert a new page; type the word Index. Click on Insert and choose Insert Index from the Index group. For this example, choose the Right align page numbers option; click OK.



5. The Index now appears on the last page. To update the index with new entries as you make changes to the document, you would click on the Index, then click on Update Index from the References tab.



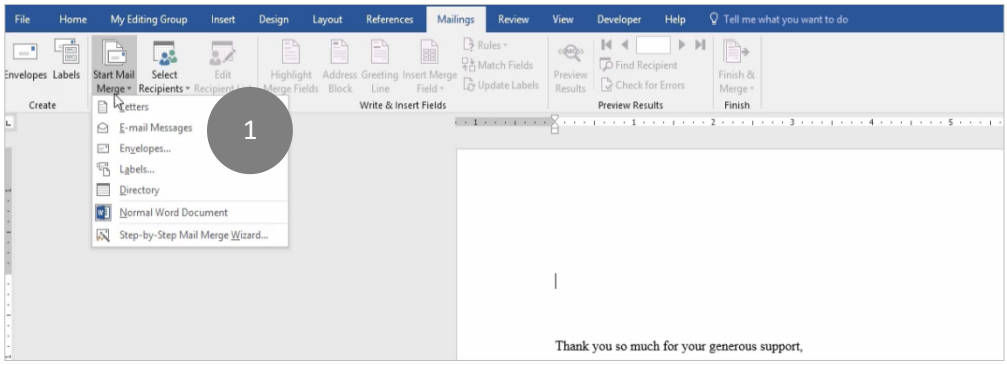
Index

5

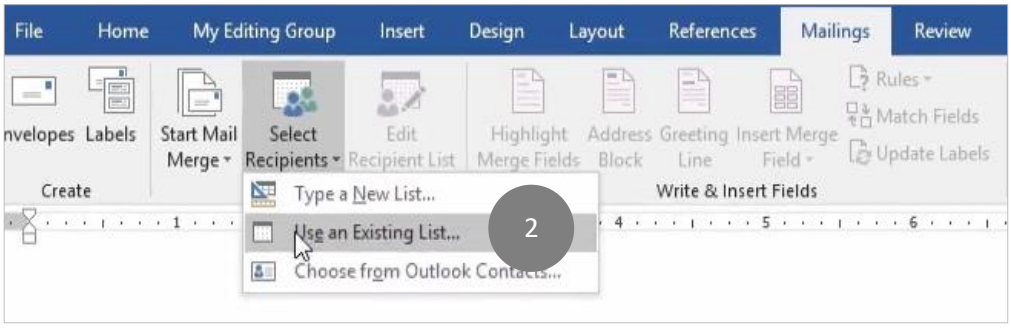
Lesson 13: Send Emails using Mail Merge

Mail Merge is a good tool to use when you need a fast and efficient way to communicate with people. A small business for example, may want to send out letters as part of a marketing campaign. A non-profit organization may need to do fundraising campaigns throughout the year by sending out emails to their donors.

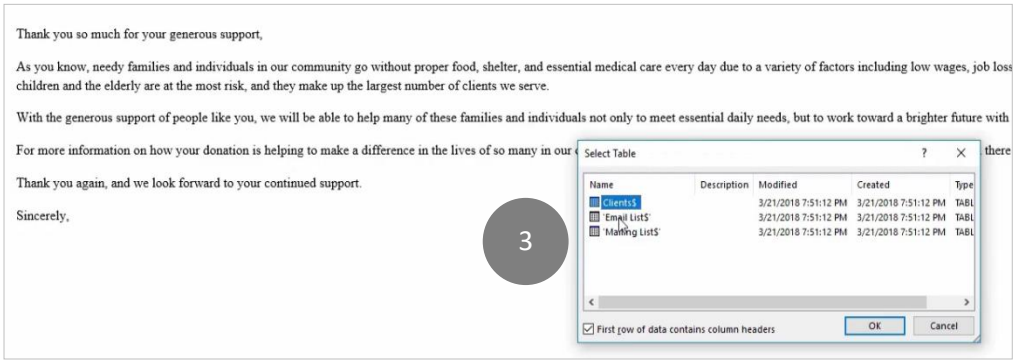
1. To start the Mail Merge, click on the Mailings tab on the Ribbon and click on the Start Mail Merge down arrow. Choose Email messages



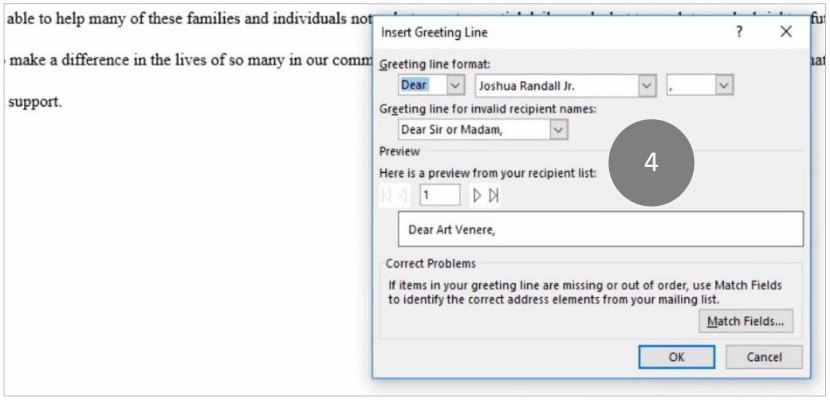
2. Under Select Recipients, choose Use an Existing List



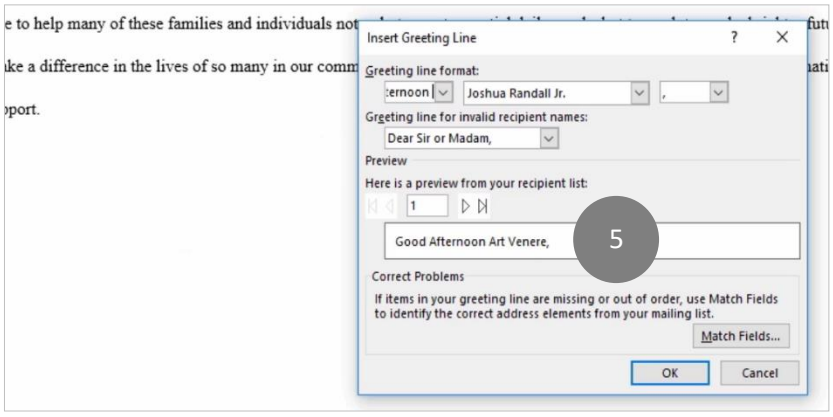
3. Locate the file that has the list of Email recipients (i.e. on a flash drive, C drive, etc.), then double-click on the file. The Select Table dialog box will appear. Double-click on the file you want to use, which in this case is the Employee List.



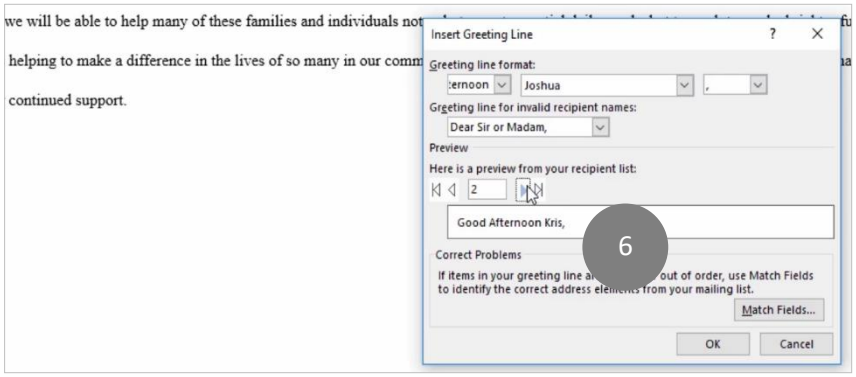
4. Click on the Greeting Line button; a dialog box will appear.



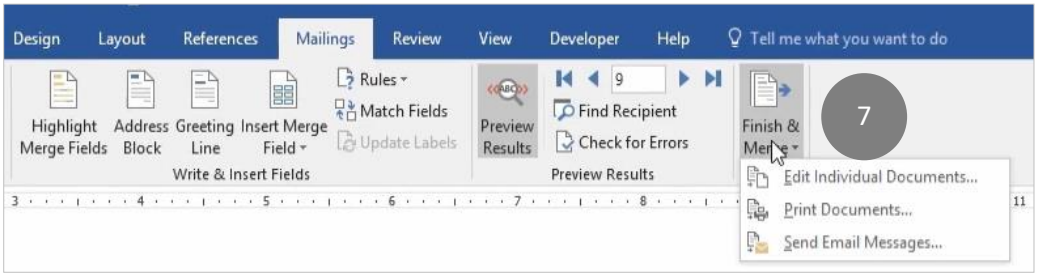
5. Under Greeting line format, change the word “Dear” to the words “Good Afternoon”; press the Space key.



6. Use the second drop-down list under Greeting line format to choose how the person will be addressed (i.e., First name only, first and last name, etc.). For this example, let’s choose First name followed by a comma. Under “Preview, you can click on the right and left arrows to see how the Greeting will look. Click OK.

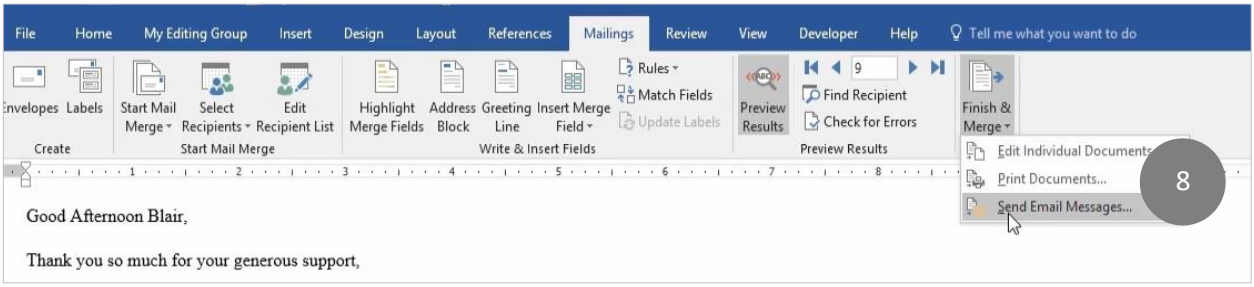


7. You can see the Preview Results button at the top of the ribbon to see how the email is going to look by clicking on the left and right arrows. Click on the Finish and Merge down arrow in the Finish group.

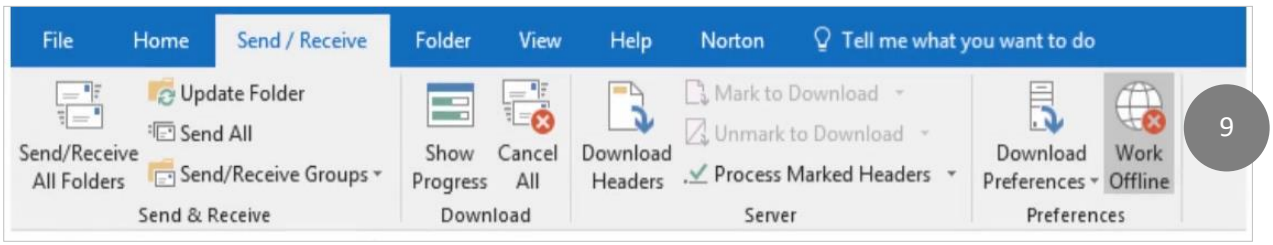


Here you have the option of creating a new Word document that merges the email messages with each name on the list. merging the email message with the names within the Word document by choosing Edit Individual Documents. You can now choose to merge all of the records, the current record or choose specific records from the list. If you choose to merge all the records and then click OK, you'll see the greeting followed by the message pasted onto multiple pages. This is a good option to choose if you want to copy and paste each individual message into your email applications (i.e. Outlook), rather than having Word automatically send them to Outlook for you.

8. To send the email message right away, Click on Send Email Messages.



9. Keep in mind that messages sent to Outlook will automatically be sent to the recipients without any kind of confirmation message or warning. If you just want the messages to be kept in your Outlook folder and not sent, you must go to the Ribbon, click on the Send/Receive tab and click on Work Offline in the Preferences group.



Lesson 14: Comprehensive Project

Project 1: Create a cover sheet that includes a title, subtitle and at least one picture or graphic.

Technology Plan for Midwest Services

The mission of Mercy Health Resources, the nonprofit which runs Midwest Services group home in Bloomsburg, Nebraska, is to help our clients improve their mental health and quality of life. Our programs depend on the use of technology to manage daily operations and maintain a high level of efficiency, so that case managers and other staff members can do their job effectively.

The process of developing an effective technology plan involves a series of steps, which starts with a comprehensive assessment what we currently have. This technology plan will outline the necessary budget, funding plan, implementation team and timeline required to improve the technology resources available to Midwest Services.

Technology Equipment Assessment

The following table presents a list of office equipment and medical equipment currently used by the Midwest Services group homes. While most of the equipment works well, there are some problems and concerns. For example, the phones are outdated and at times, it is difficult to hear the person on the other end. The desktop computer in the case manager's will often malfunction and restart on it's own, which causes data to be lost. The standing blood pressure monitor does not work well and the Internet connection is very slow. SERv, the online client record system also tends to be slow.

Project 2: Create a Table that summarizes the current inventory of equipment.

Desktop computer (3), Paper shredder (2), Copier (1) Fax machine (1), Desktop telephone (4), Desktop printer (1), Label printer (1) 3-hole electric punch (1).

Goal 1 – Purchase New Equipment

Our goal will be to find the best deal by comparison shopping, finding the right vendor, identifying the best maintenance agreement and capitalizing on our nonprofit status to obtain discounts. The first priority will be to get a new desktop computer for the case manager office, four new desktop telephones and an extra-large size blood pressure cuff or a wrist or leg blood pressure cuff.

Goal 2 – Training

Once a new extra-large blood pressure cuff is purchased, there should be staff training for all case managers by the program nurse immediately and every year during the required annual medication administration training. This will increase the accuracy of blood pressure

measurements to meet the standard of SERv clients In addition, further training is needed for SERv. We are also moving toward a totally electronic charting system.

Project Timeline

Project 3: Create a Project Timeline by creating a SmartArt Graphic.

Months 1-3:

Review technology plan and gain approval to move forward

Price technology equipment at local office/medical supply stores

Purchase and install desktop computer, telephones & XL BP cuff

Update intranet

Months 4-5:

Create blood pressure measurement training program

Create SERv system training program

Implement SERv system training for all staff

Implement blood pressure measurement training for all staff

Months 7-9:

Complete integration of client charting from paper charts to 100% electronic

Evaluate efficiency of new technology

Evaluate improvement in quality of client SERv

Months 10-12:

Review technology plan and make any necessary changes

Re-assess technology needs and goals

Final reports and evaluation

For any human services technology to be effective, long-term planning and support should be taken under consideration. This proposed technology plan will most likely take a full twelve months to implement, from purchasing equipment to implementing training programs to the final reports and evaluation.

Project Budget

The budget shows the costs associated with purchasing and installing technology equipment, providing employee training, technology support and consulting fees. Midwest Services will follow the 70/30 rule when making any purchase decisions. For every dollar budgeted for

technology, 30 cents should be projected for spending on hardware and software equipment. 70 cents to each dollar should be used on training and technical support.

Project 4: Create a new format for this budget by either creating a worksheet in Excel or a Table in Word.

Group Home Fee Income $2,100.00
Government Grants $2,500.00
Private Donations $900.00
Fundraising $500.00
Total Funds Available for Technology $6,000.00
Technology Plan Costs
Equipment
Desktop computer $399.99
Desktop telephones $439.96
Extra-large size blood pressure cuff $90.00
Installation
Desktop computer $50.00
Desktop telephones $400.00
Training
Blood pressure measurement $375.00/year
SERv system $2,250.00/year
Technical Support
Desktop computer $200.00/year
SERv system $400.00/year
Technology Plan Consultant Fee $975.00/year
Total One-Time Technology Plan Costs $1,079.95
Total Annual Technology Plan Costs $4,200.00
Total Technology Plan Costs $5,279.95
Balance $720.05

Funding Plan

Funding is a universal issue, especially for nonprofits like Mercy Health Resources, which rely heavily on outside funding sources to operate. Funding for the Midwest Services technology plan will come from four different sources: group home fee income, government grants, private donations, and fundraising. Group home fee income generates $2,100 for technology. Government grants bring the largest amount of funding at $2,500. Private donations and fundraising contribute the remaining $1,400 for a total of $6,000 of funds to use for the technology plan.

Project 5: Create a Pie Chart that summarizes the funding plan.

The Implementation Team

Team effort is essential during the technology plan implementation period. The Regional Director oversees the operation of all group homes in the region, including Midwest Services. The following organization chart displays the other members of the team:

Project 6: Create a SmartArt organization chart that uses the following information:

Level One: Regional Director

Level Two: IT Manager, Finance Director (both report to the Regional Director)

Level Three: Network Administrator (reports to the IT Manager), Technology Trainer (reports to the IT Manager), Staff Account I (reports to the Finance Director), Staff Accountant II (reports to the Finance Director).

Excel Fundamentals

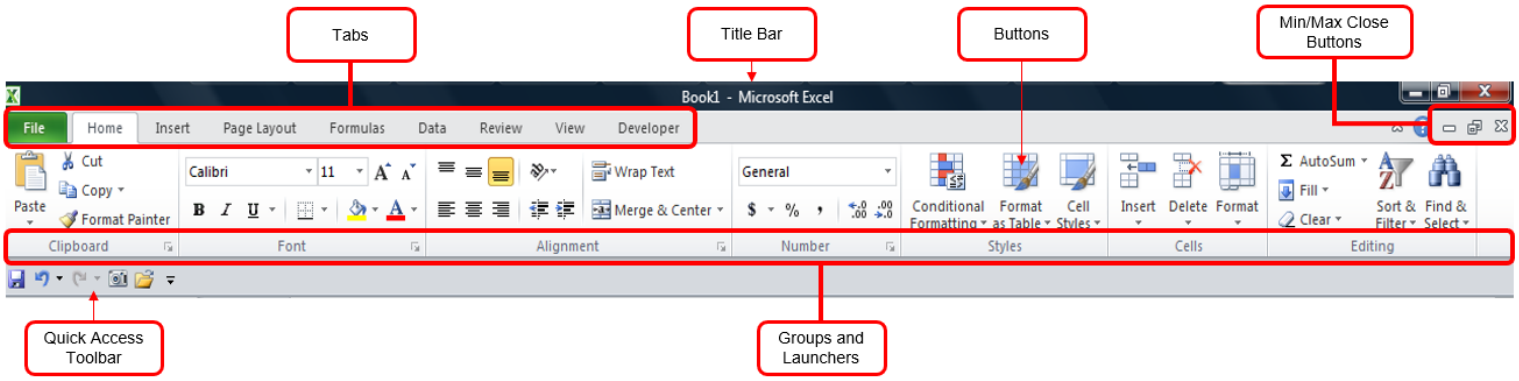
Topics Covered

- Getting Started
- Entering Data and Formatting Cells
- Using Cut, Copy and Paste
- Formulas and Functions
- Data Lists and Tables
- Charts and Visuals
- What-If Analysis
- Sorting and Filtering Data
- Introduction to PivotTables
- Create Passwords and Protect Cells
- Using Excel with Office applications
- Microsoft Excel certification training
- Appendix A: Excel for Small Business
- Appendix B: Excel and Personal Finance

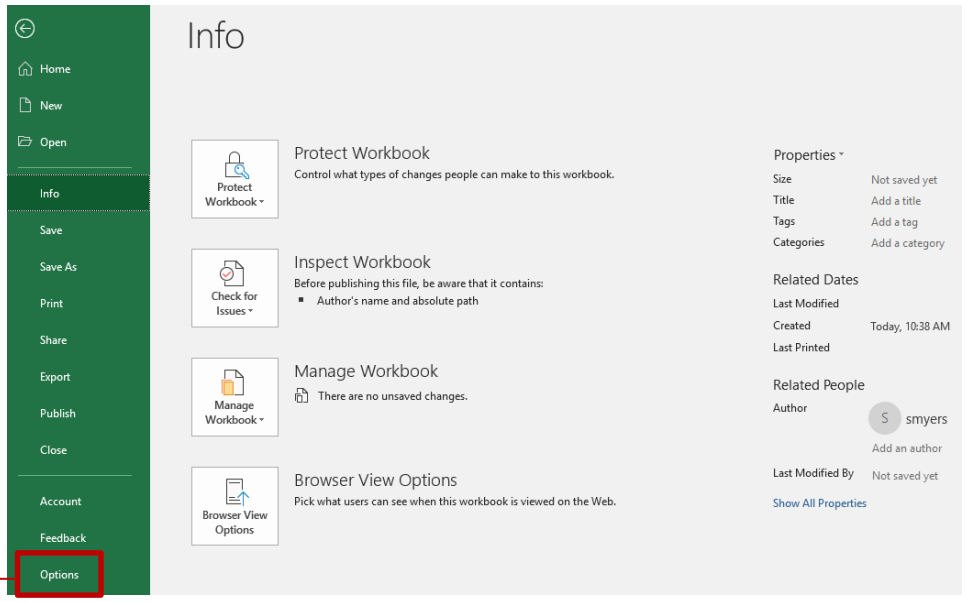
Chapter 1: Getting Started

The Ribbon

The Ribbon is at the top of the Excel window and provides you with the tools you need to create what's referred to as **Workbooks.** The **File** tab will open Backstage view, which allows you to select from many different commands and tools.

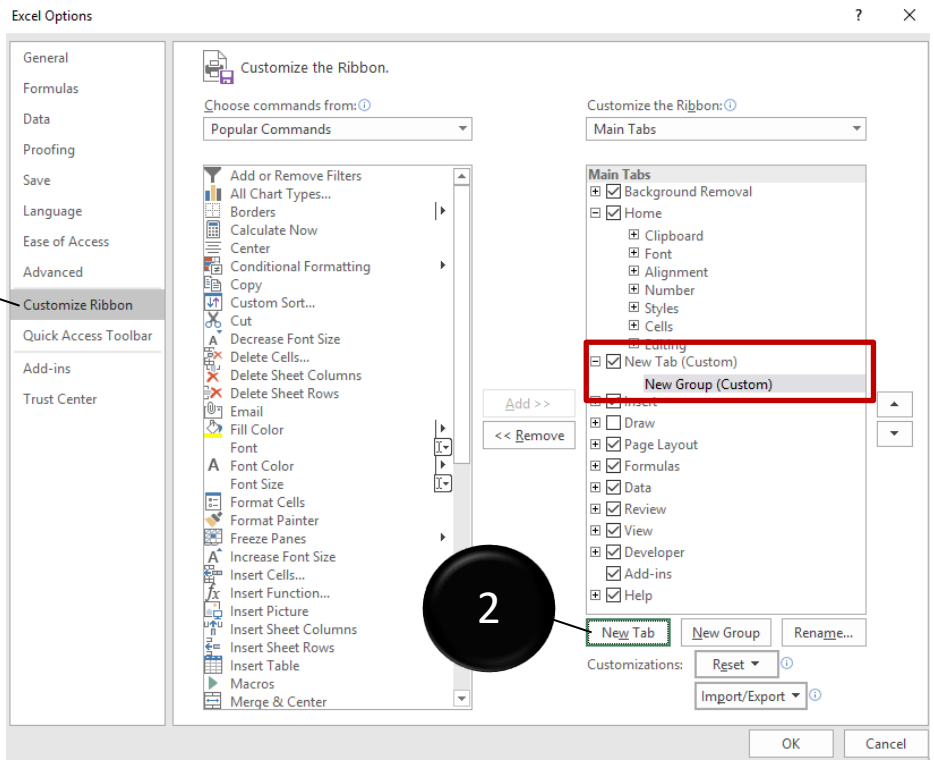


When you click on the File tab to open Backstage View, you'll see a large number of tools that are used when working with Excel files, including New, Open, Print and Export. The **Options** tab displays additional tools that can be used to customize how Excel performs and displays data.



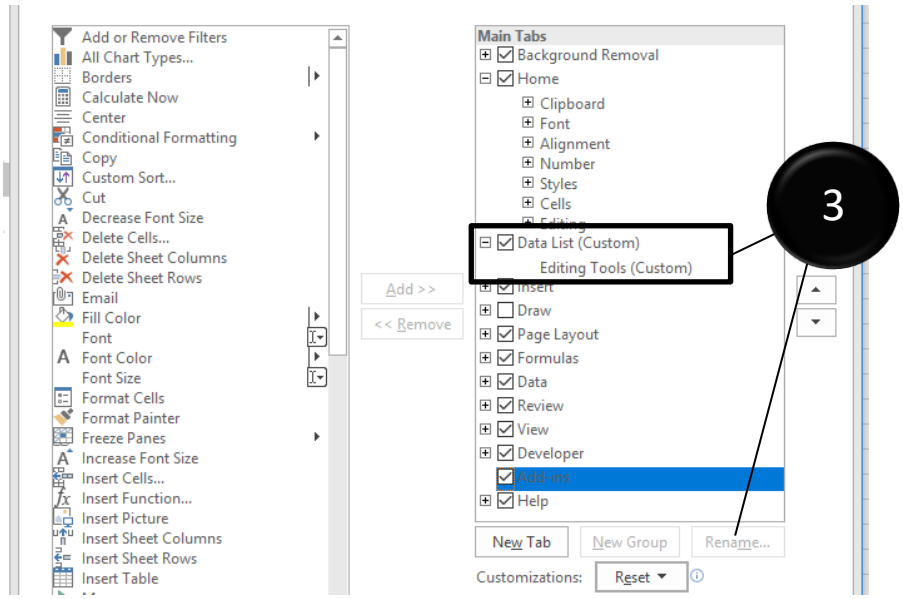
Open Backstage View to add a new Tab to the Ribbon:

1. Click on the File tab, then click on Options button; choose Customize Ribbon.
2. Click on New Tab.

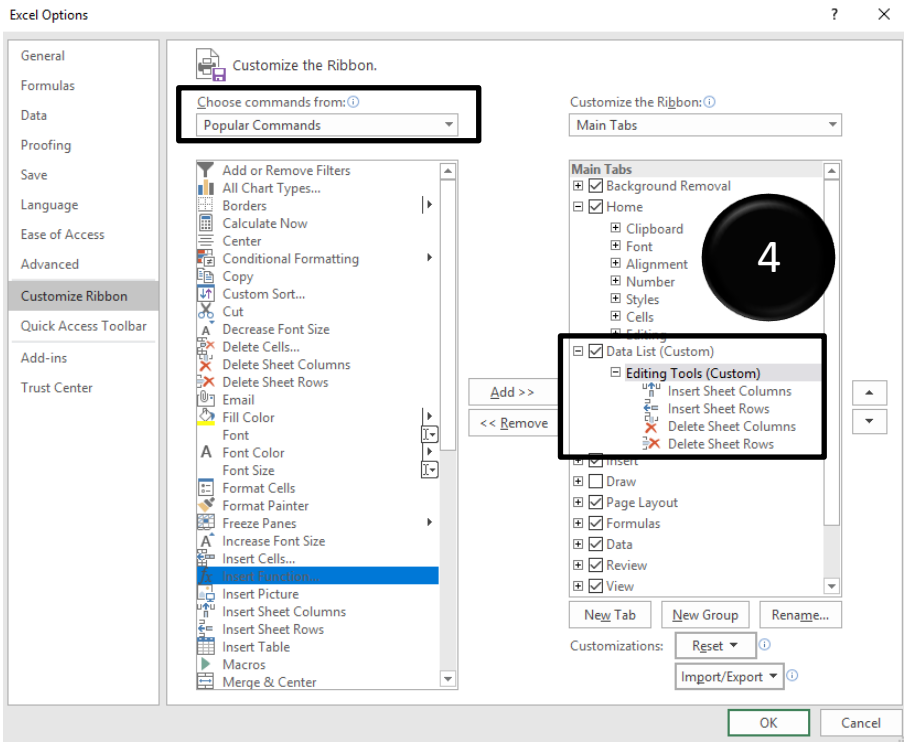


Let's create a Tab that has tools that can be used to manage a data list.

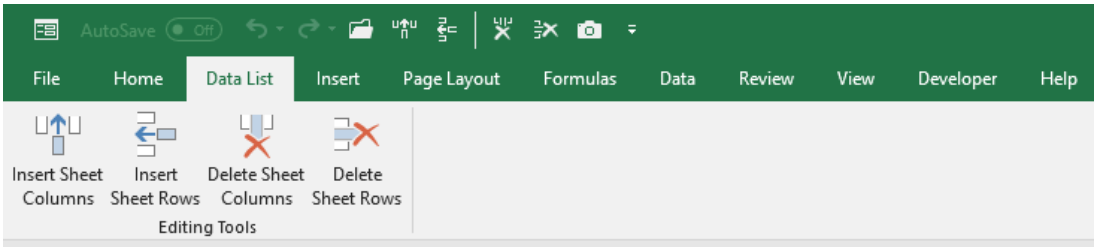
3. Click on New Tab (custom) then click on Rename button and name the Tab "Data List"; click on New Group (custom), then click the Rename button and name the group "Editing Tools".



4. With Popular Commands selected from where is says “Choose commands from”, use the Add button to choose Insert Sheet Columns, Insert Sheet Rows, Delete Sheet Columns and Delete Sheet Rows.



5. Click OK. You can now see that a Data List tab appears next to the Home tab.

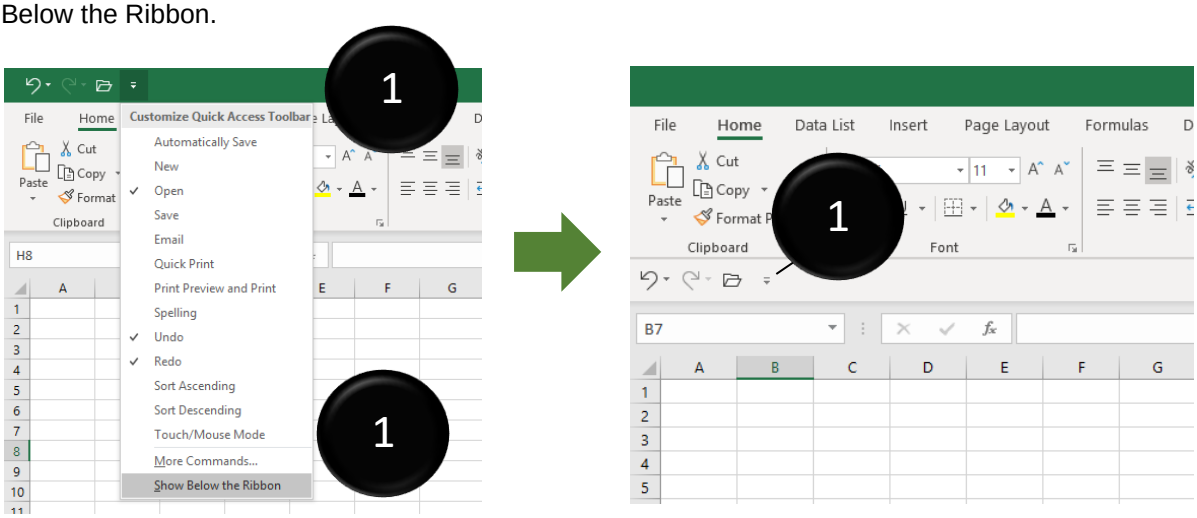


Quick Access Toolbar

The Quick Access Toolbar is another way to get things done in less time. By default, it's located at the top of the Ribbon, but you can move it to the bottom to make it easier to see.

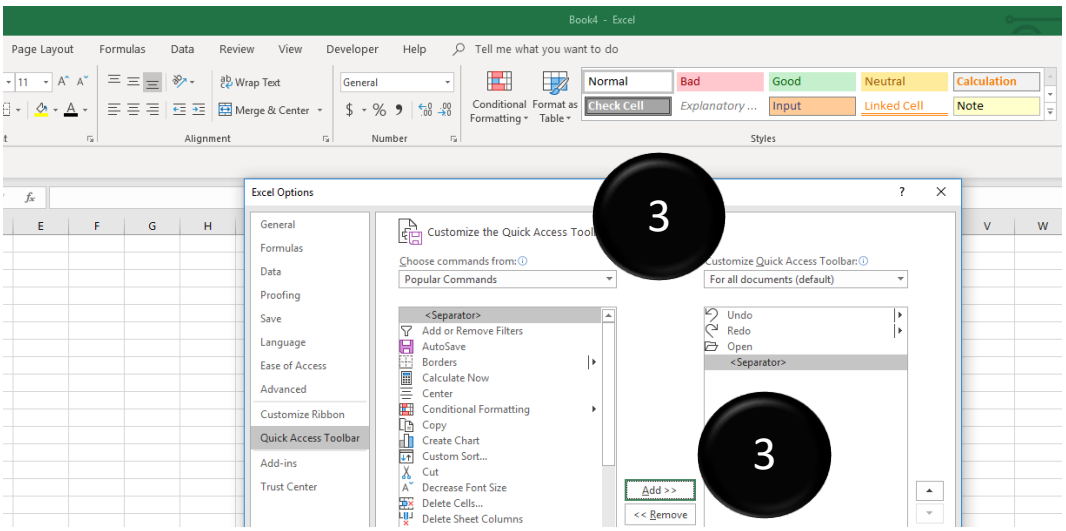
Activity 1.2: Customize the Quick Access Toolbar (use the same Excel file from Activity 1.1)

1. Click on the down arrow where it says "Customize the Quick Access Toolbar"; choose Show Below the Ribbon.

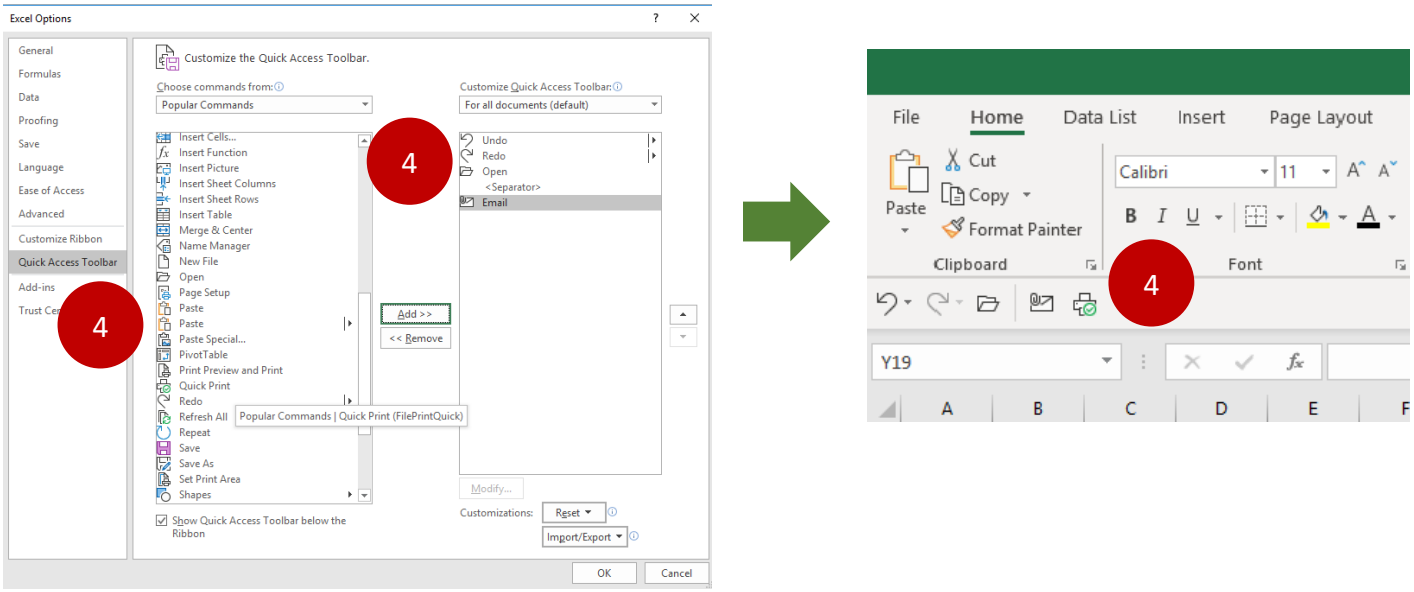


2. From here, you can add more tools by clicking on the down arrow and choosing More Commands.

3. The Excel Options dialog box will open. With Separator selected, click on the Add button to add some space between the tools already selected and the new tools that will be added.



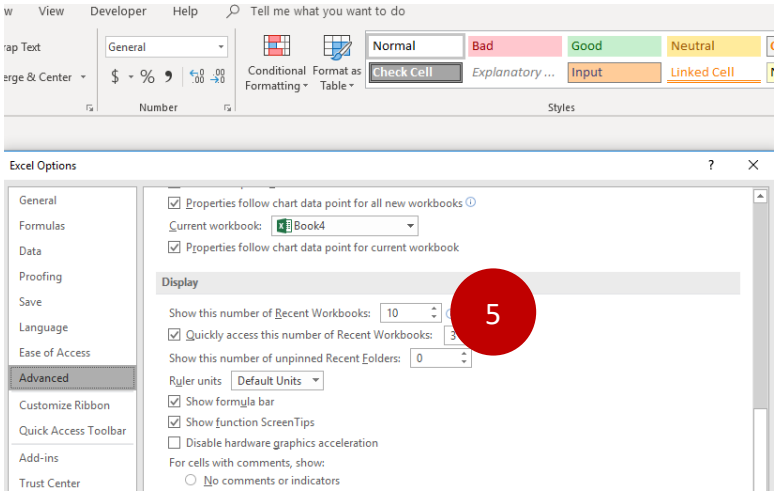
4. Use the scroll bar under Popular Command to choose Email and Quick Print; click OK. The tools will now appear as icons on the Quick Access Toolbar.



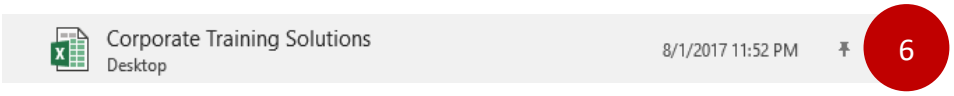
Organize and View Workbooks

You can get easy access to workbooks used the most frequently by clicking on the File tab, then clicking on Excel Options; choose Advanced.

5. Under Display, click inside the Show this number of Recent Workbooks box and choose a number (i.e., 10); click OK.

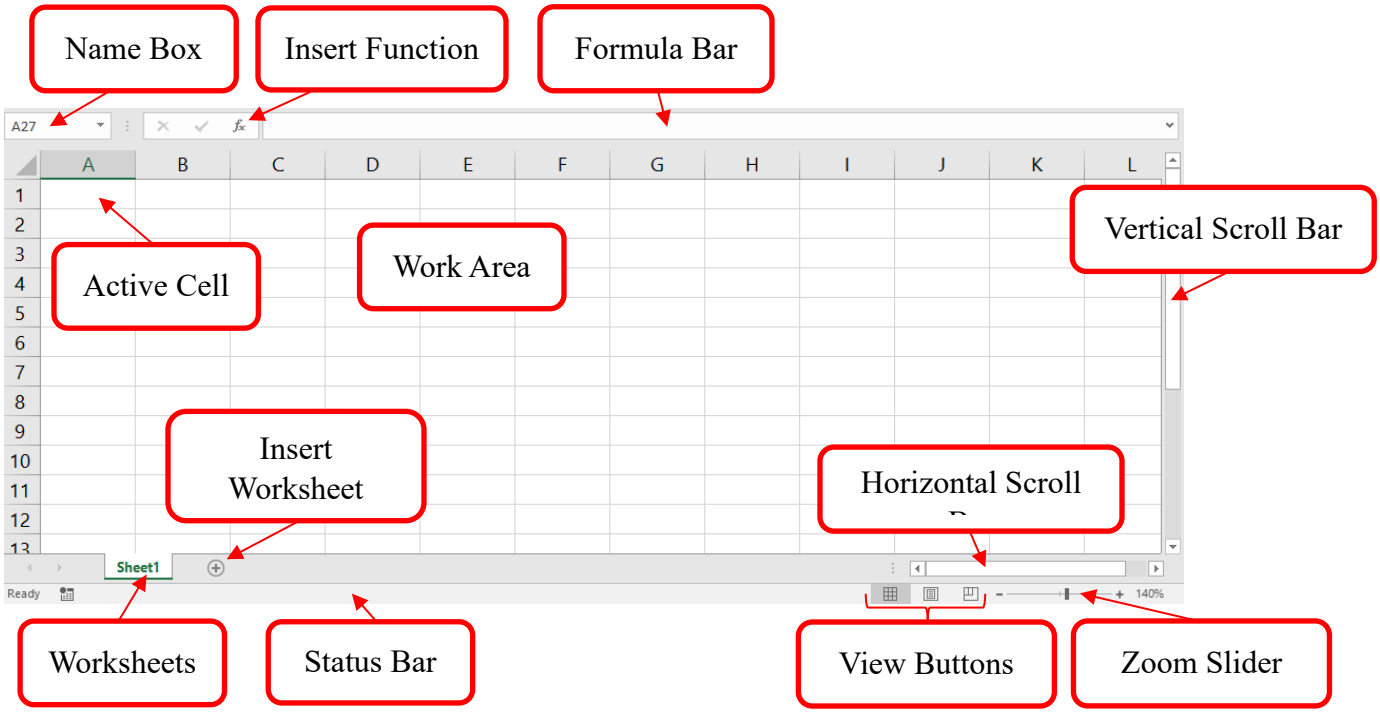


6. When you click on the File tab, then click on Open, you'll see the most recently used fields and the ability to "pin" the frequently used documents by clicking on the pin icon.



Twelve Major Parts of an Excel Worksheet

Here is a summary of the Excel worksheet parts you should be familiar with:



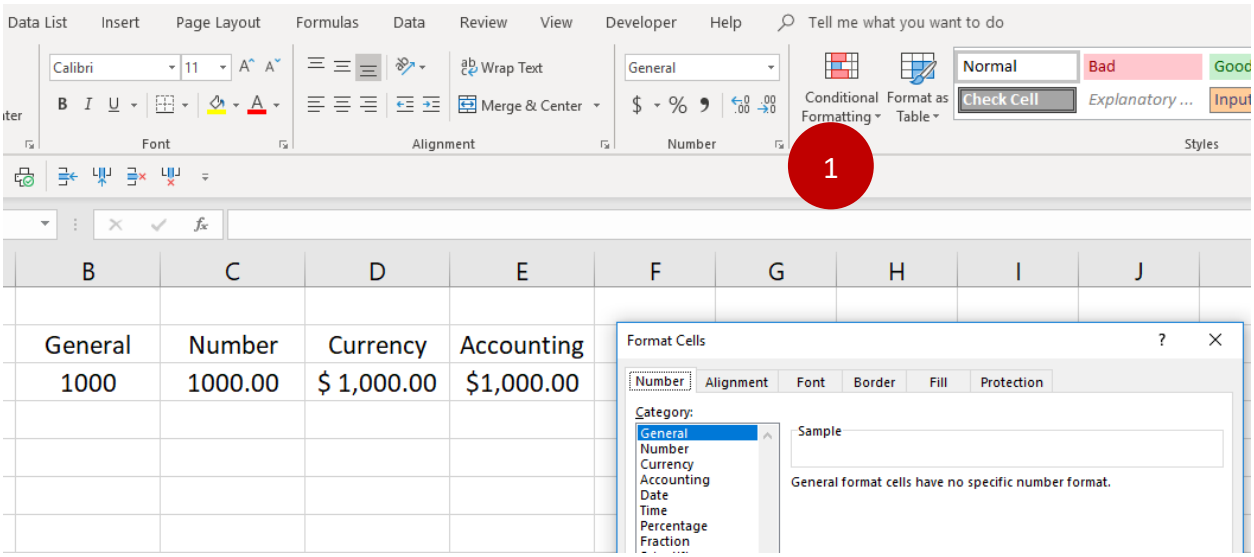
Description of Worksheet Parts:

1. Name Box – shows the cell location (ex. A1, A2, etc.)
2. Active cell – refers to the cell currently being used
3. Insert Function Button – opens the Insert Function dialog box
4. Formula Bar – space where text, numbers and calculations are entered
5. Work area – shows data inputs and calculations
6. Vertical scroll bar – moves the work area up and down
7. Status Bar – displays information about the open file. You can right-click on Status Bar to open what's called the Customize Status Bar to choose display options
8. Worksheets – indicates the number of worksheets open
9. Insert Worksheet – opens a new worksheet tab
10. Horizontal Scroll Bar – moves worksheet area to the right or left
11. View Buttons – switch between Normal, Page Layout and Page Break Preview
12. Zoom Slider – changes the magnification of the worksheet between 10%-400%

Chapter 2: Entering Data and Formatting Cells

To enter data into a cell, you can either type the data into it, type it into the Formula bar or copy and paste the data from another software application or a website. After the data is entered, you should be familiar with the different ways that the text and numbers can be formatted. Some common Number formats used include the General, Number, Currency and Accounting formats.

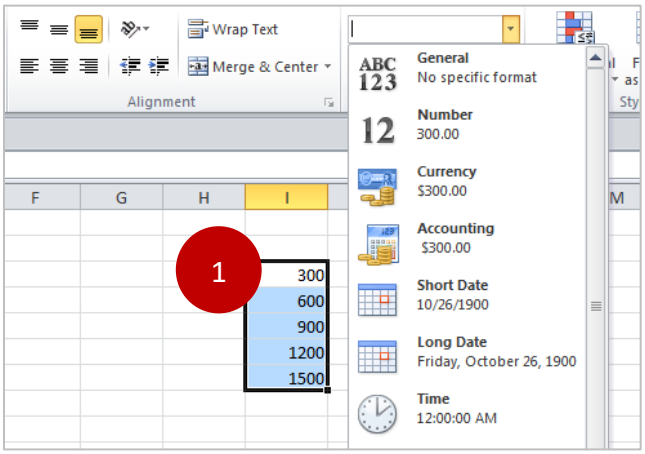
1. Click on the Number Launcher from the Number group, then choose a format.



List Boxes

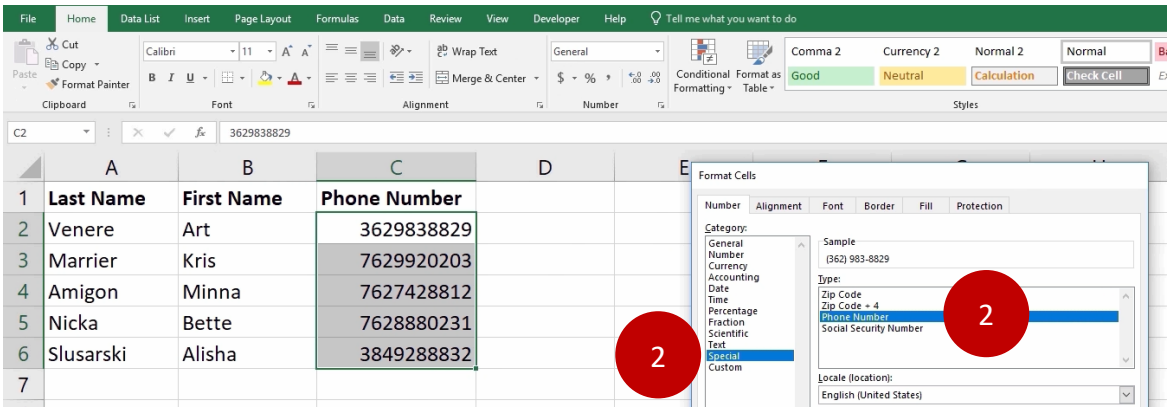
Several buttons within the Excel groups on the Ribbon will have a list box associated with them, which will allow you to choose a format and apply it to a cell or range of cells.

To format numbers, you can select them and then click the down arrow from the Number group from the home tab to change the formatting.



Special Formats can be applied to cells in a data list that includes zip codes, phone numbers or social security numbers.

2. Select the data. From the Home tab, click on the Launcher button in the Number group; click on Special, then choose Phone Number.

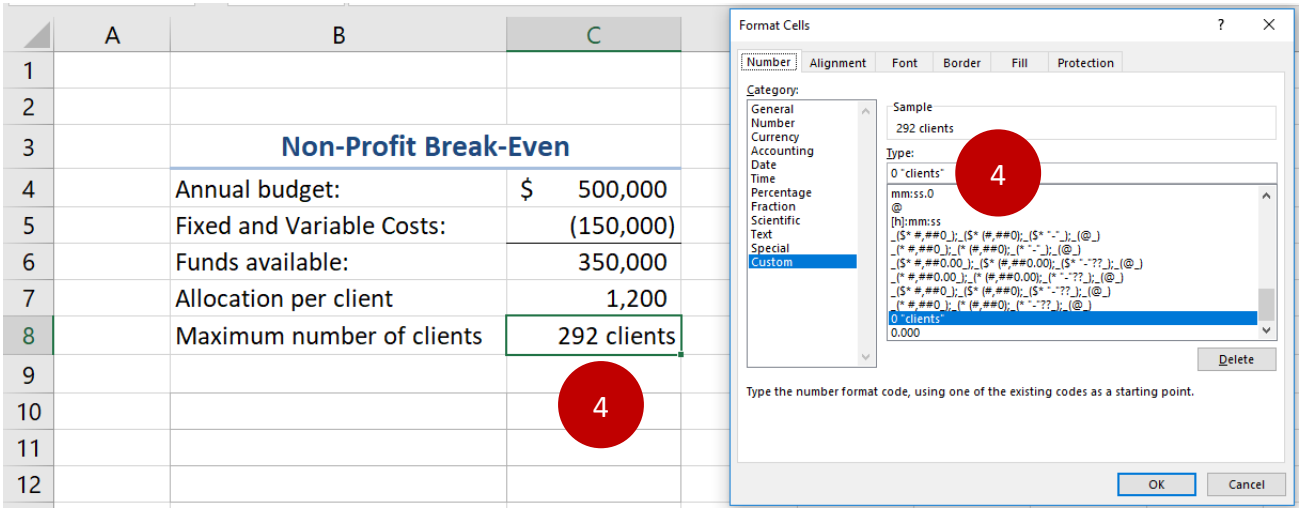


You can also apply the format to one or more empty cells, so that any number entered into the cells will automatically be formatted as phone numbers.

Apply Custom Formats

Custom formats can be used when you want to see text displayed before, after or in between any numbers that are inputted into the cell.

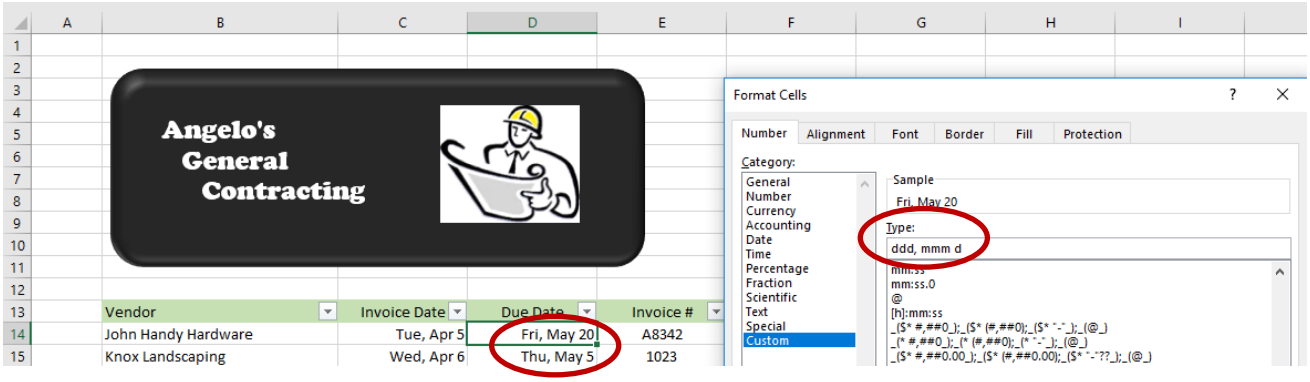
3. Click on a cell, then click on the Launcher button and choose Custom.
4. Enter 0 and then input the word Clients in quotation marks (0 “clients”); click OK.



Here are some other examples of custom formats:

To Input:	You Would Type:
Interest Rate of 9%	“Interest Rate of” 0%
500 units	0 “units”
Invoice is 30 days past due	“Invoice is” 0 “days past due”
300,000 clients	0,0 “clients”

Custom format can also be applied to dates. If you have a worksheet where you want to see the day of the week spelled out, for example, you would click on Custom and then input a combination of the letters d and m; In this example, inputting **dd, mmm d** will display the date as Fri, May 20.

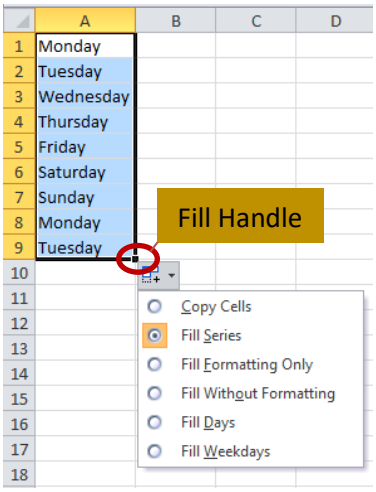


Use Autofill to Enter Data

Autofill is a tool that can be used to avoid typing or retyping information that is a part of a series, such as days of the week, months, years or patterns of numbers. If you were to type “January” into a cell, for example, you could use Autofill to add the rest of the months in the year.

To use Autofill, enter the first word or value of what you want to Autofill. Select that value and drag the cell to the left or the right by left clicking on the **Fill handle,** which is the black cross in the lower right-hand corner. Dragging the Fill Handle down to the right will increase the series; dragging up or to the left will decrease the series. After the data has been entered into the worksheet cells, you can then use the **Autofill Options** button.

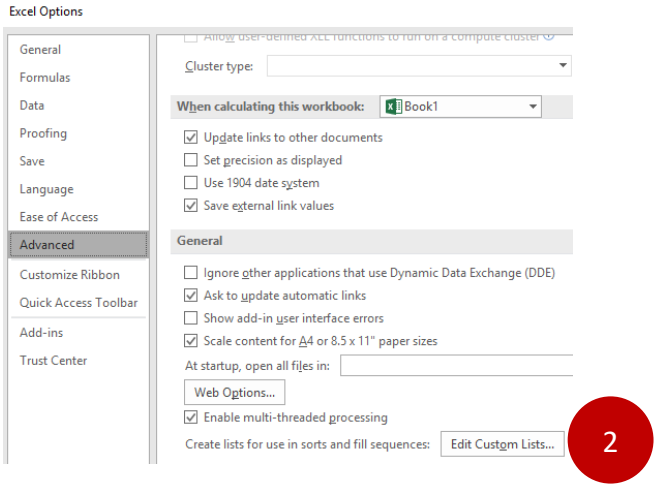
In this example, Autofill was used to enter every day of the week. You could also use the Options button to just input weekdays, which would exclude Saturday and Sunday.

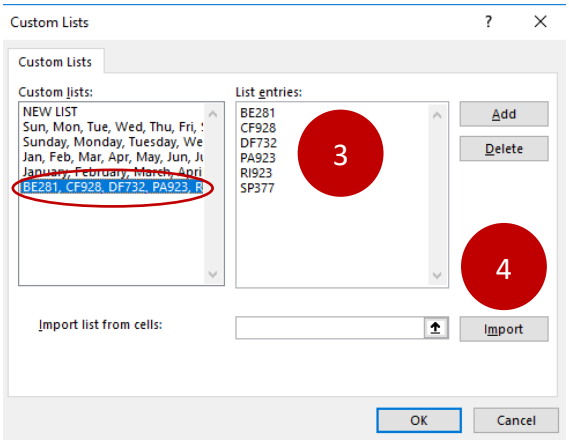


Create a Custom Fill Series

You can create a list of information that can be used to Autofill a range of cells, such as product lists, customer lists, classes or price lists.

1. Click on the File tab, then choose Options from Backstage View.
2. Go to the General section; click Edit Custom Lists.





3. Type data for the new list in the List entries box, which each list item separated by commas. Click Add, then click OK.

4. If you already have a list of information, you can choose Import list from cells, then choose OK to add the cell range to your custom lists.

Adding Comments

Comments are helpful when you need to describe your worksheet entries and provide explanations for others to review. Examples would include product or service descriptions, conditions and disclaimers (good until, expires on…) and notes to employees or customers. Adding comments will not affect the worksheet's functionality. You can enter and manage comments into a worksheet in the following ways:

1. Inserting a comment into a cell:

   Click on the Review tab → click New Comment Button.

2. Permanently display one or more comments:

   Click on the Review tab → Comments group → click Show/Hide Comments button.

3. Move among comments:

   Review tab → Comments group → Previous or Next buttons button.

4. Edit comments:

   Click on the comment → click on the Edit Comment button.

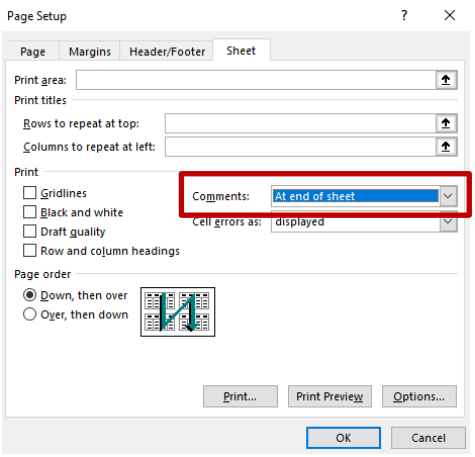
5. Size or reposition comments:

   Display the comment then click its border → drag sizing handles or drag its frame to reposition.

6. Printing comments at the end of the worksheet:

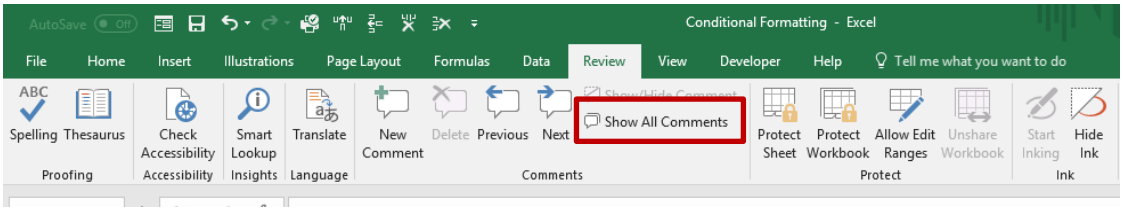
   Page Layout tab → Page Set-up launcher button.

   From here, you would click on the Sheet Tab. From the Comments drop-down menu, choose “At End of Sheet”; click OK.



7. Print permanently displayed comments:

   Follow the same steps for printing comments at the end of the sheet, then click the “Show All Comments” button from the Comments group.

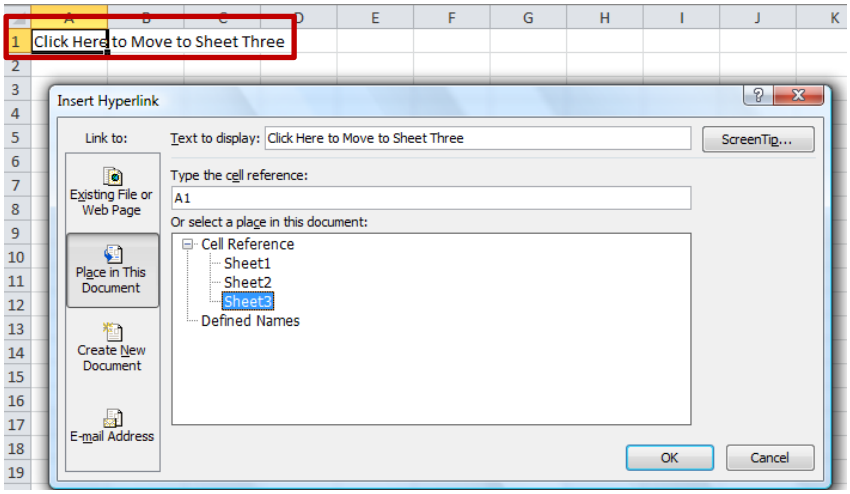


8. Deleting a comment:

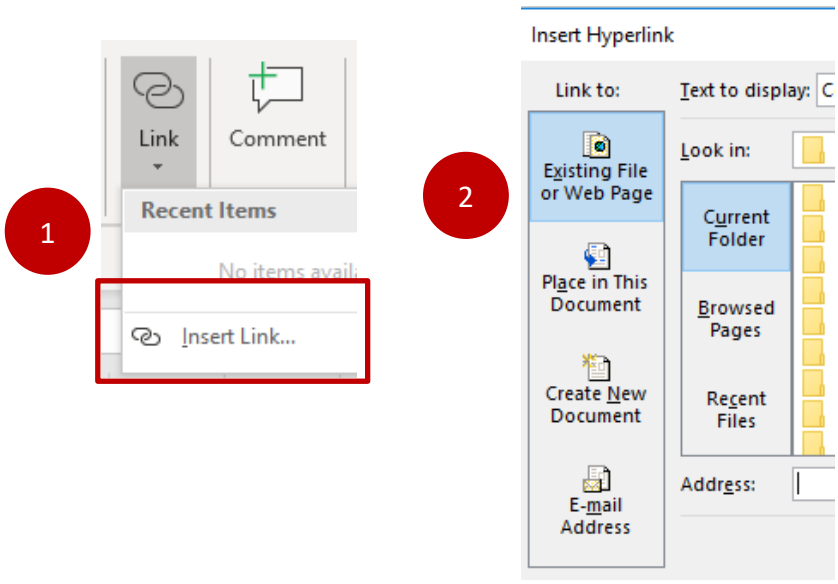
   Review tab → Comments group → Delete button or right click → Delete Comment.

Adding Hyperlinks

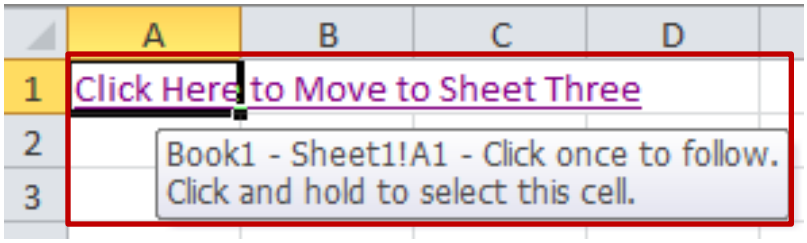
Hyperlinks are useful when you want to navigate back and forth between files or other worksheets within the same workbook. Choose a cell that has the information that will be used for the hyperlink. For example, you can type “Click Here to Move to Sheet Three” in cell A1:



1. Click on the Insert tab, then click on Insert Link from the Links group.
2. Choose from the list of Insert Hyperlink options, then click OK.

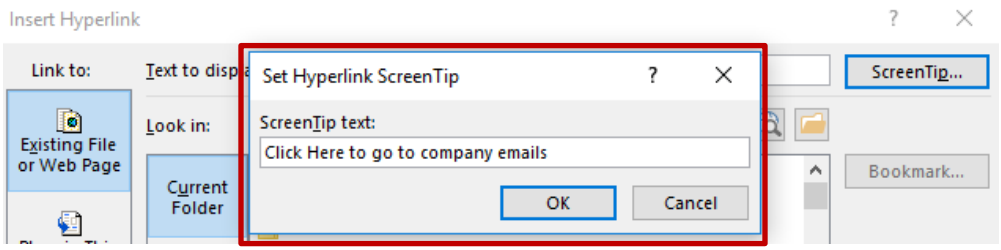


3. When you move the cursor over text or numbers, a ScreenTip will appear and describe the full path of the link.



Editing a Hyperlink

Right click on Hyperlink → Edit Hyperlink → ScreenTip button. Type information into the ScreenTip text box → click OK → click OK again to close the Edit Hyperlink dialog box:

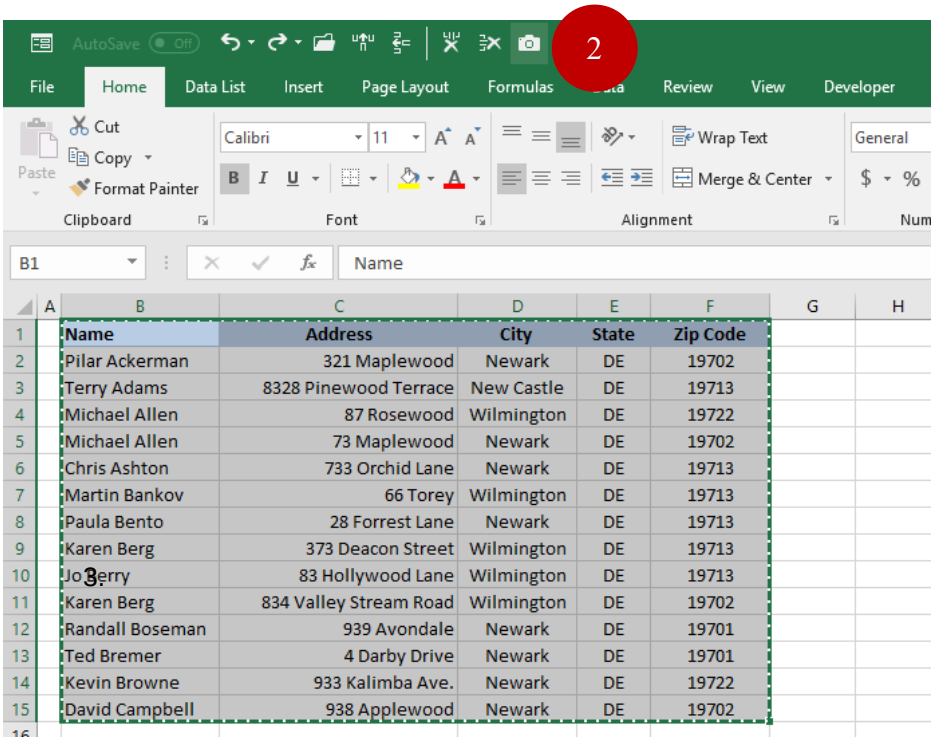


Excel Camera Tool

The Excel Camera is a way to capture an image of worksheet data and then paste the image into other Office applications. You can access the camera by first adding it to the Quick Access Toolbar:

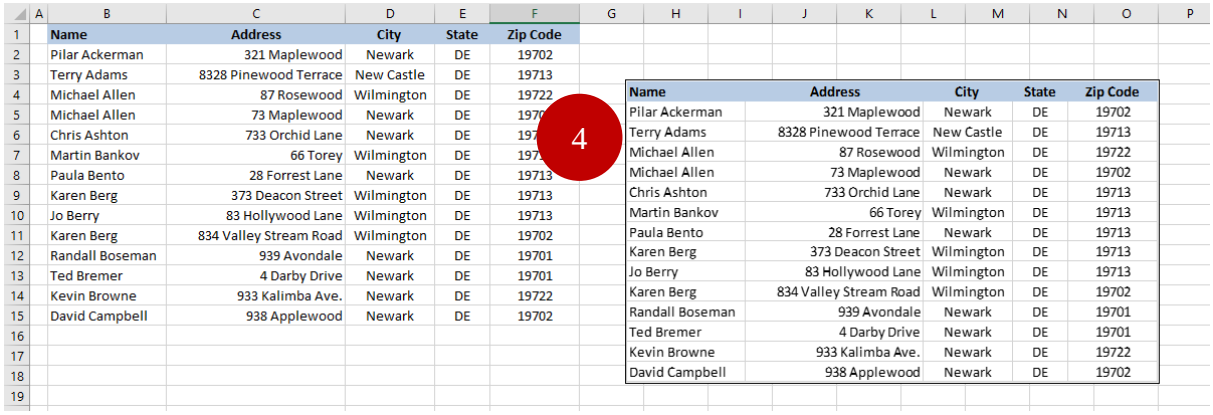
1. Office or File tab → Excel Options → Quick Access Toolbar → All Commands. Choose the Camera option → click Add → click OK.

2. To use the Camera tool, select the worksheet data you want to capture and then click on the Camera icon on the Quick Access Toolbar.



	Name	Address	City	State	Zip Code
2	Pilar Ackerman	321 Maplewood	Newark	DE	19702
3	Terry Adams	8328 Pinewood Terrace	New Castle	DE	19713
4	Michael Allen	87 Rosewood	Wilmington	DE	19722
5	Michael Allen	73 Maplewood	Newark	DE	19702
6	Chris Ashton	733 Orchid Lane	Newark	DE	19713
7	Martin Bankov	66 Torey	Wilmington	DE	19713
8	Paula Bento	28 Forrest Lane	Newark	DE	19713
9	Karen Berg	373 Deacon Street	Wilmington	DE	19713
10	Jo Berry	83 Hollywood Lane	Wilmington	DE	19713
11	Karen Berg	834 Valley Stream Road	Wilmington	DE	19702
12	Randall Boseman	939 Avondale	Newark	DE	19701
13	Ted Bremer	4 Darby Drive	Newark	DE	19701
14	Kevin Browne	933 Kalimba Ave.	Newark	DE	19722
15	David Campbell	938 Applewood	Newark	DE	19702

4. When the small cross appears, you can hold down the left click button on the mouse to apply the image. You can then press CTRL+C to copy and paste the image into another application.

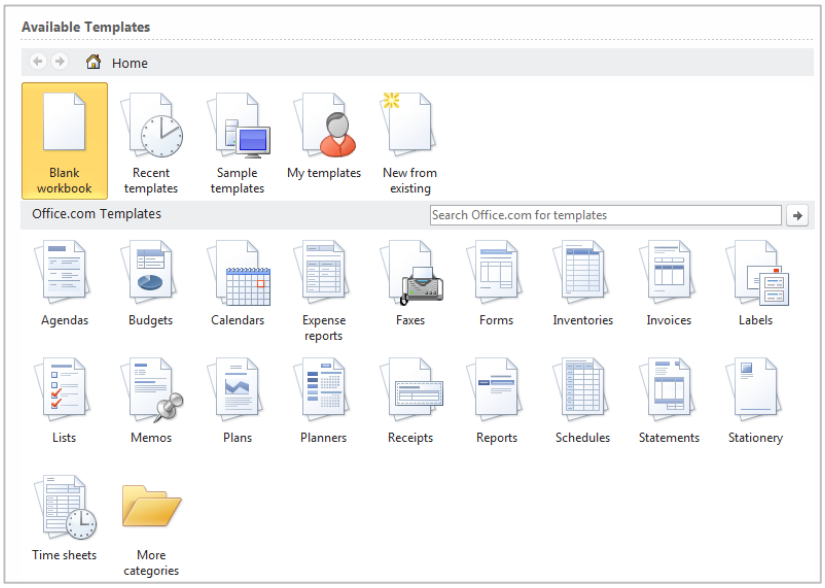


	Name	Address	City	State	Zip Code
2	Pilar Ackerman	321 Maplewood	Newark	DE	19702
3	Terry Adams	8328 Pinewood Terrace	New Castle	DE	19713
4	Michael Allen	87 Rosewood	Wilmington	DE	19722
5	Michael Allen	73 Maplewood	Newark	DE	19702
6	Chris Ashton	733 Orchid Lane	Newark	DE	19713
7	Martin Bankov	66 Torey	Wilmington	DE	19713
8	Paula Bento	28 Forrest Lane	Newark	DE	19713
9	Karen Berg	373 Deacon Street	Wilmington	DE	19713
10	Jo Berry	83 Hollywood Lane	Wilmington	DE	19713
11	Karen Berg	834 Valley Stream Road	Wilmington	DE	19702
12	Randall Boseman	939 Avondale	Newark	DE	19701
13	Ted Bremer	4 Darby Drive	Newark	DE	19701
14	Kevin Browne	933 Kalimba Ave.	Newark	DE	19722
15	David Campbell	938 Applewood	Newark	DE	19702

Using a Template

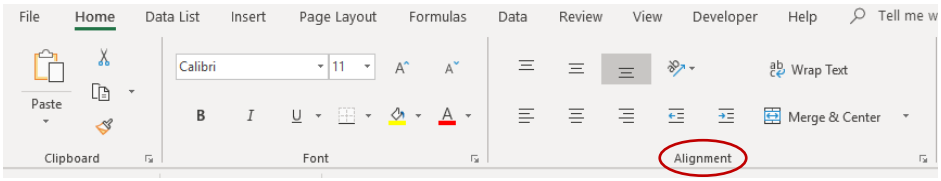
A template is a workbook preformatted with information that can be changed or customized. New information can be typed into cells or placeholders within the template (a placeholder is the section of the template that can be edited).

Click the Office or File button → New. Choose from one of the available templates or create a new one.

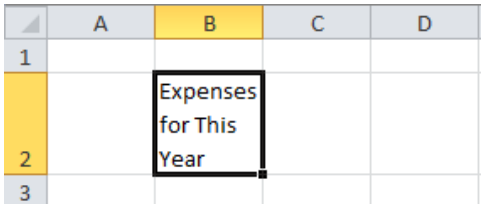


Cell Alignment

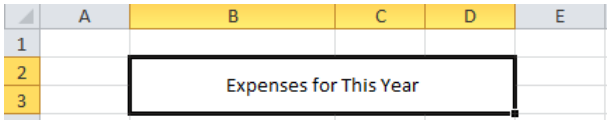
There are times when you need text or numbers to appear beyond the limitations of just one cell. The size, width and length of a cell can be changed by using one of the tools from the Alignment group:



1. Wrap Text – allows you to view inputted information within a restricted number of cells:



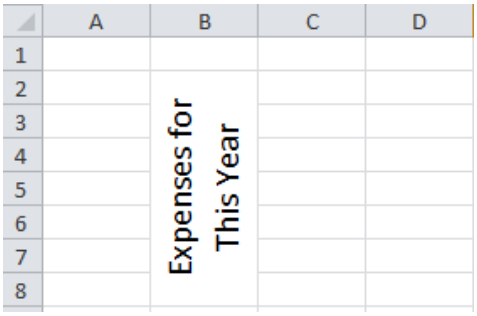
2. Merge & Center – choose number of cells that you want to include in the merge:



3. Rotated Text – display text or numbers on an angle.

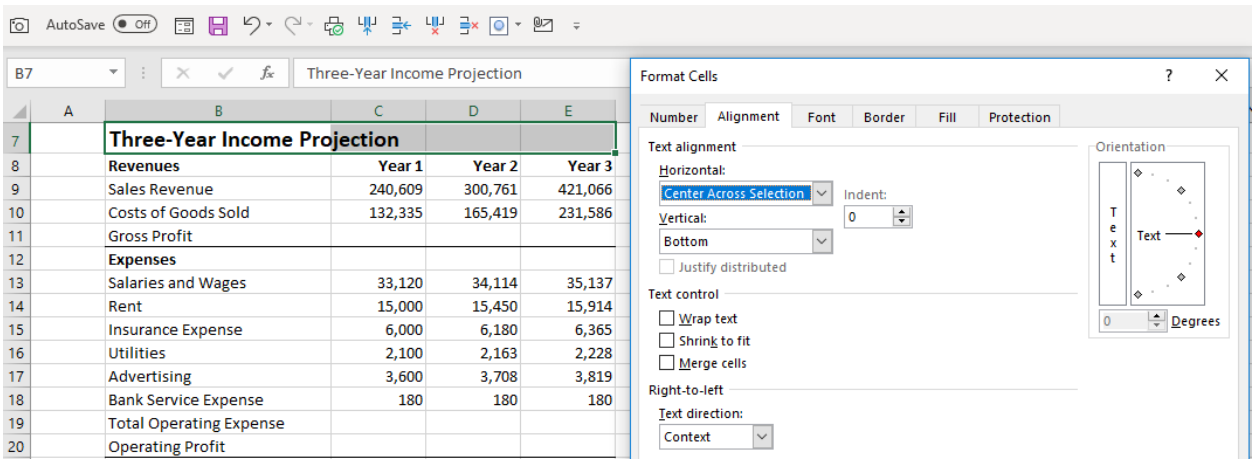
   a. Select the number of cells where the rotated text will appear. For example, if the text is in cell B2, you may want to select rows B2 to B8.

   b. From the Alignment group you will then choose Merge & Center, Wrap Text and the Rotate Text Up from the Orientation button.



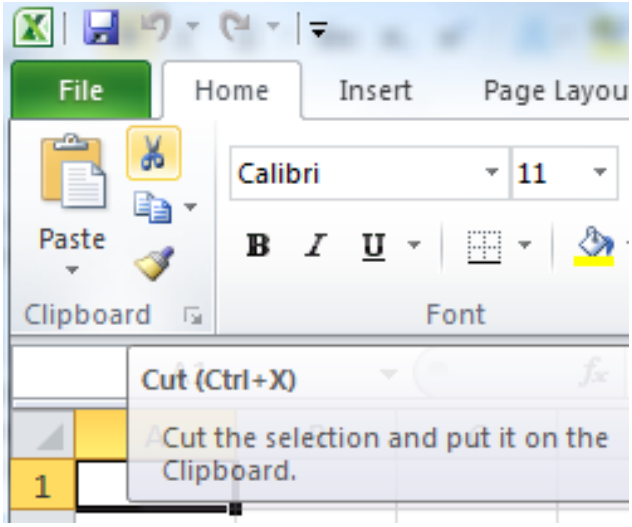
4. Center Across Selection

   This is a Text Alignment tool that can be used when you want to input a title or label onto a worksheet. Select the cells where you want the text to appear (B7:E7). Click on the Alignment launcher and choose Center Across Selection from the Horizontal drop-down list.



Using ScreenTips

You can position the mouse pointer over a command to view a **ScreenTip**, which will provide you with a description on what the command does or will provide you with a keyboard shortcut. For example, if you were to position the mouse pointer over the scissors icon in the Clipboard group, you would see that the shortcut for the cut command, which would be CTRL+X.



Shortcut Keys and Commands

There are over 75 different types of shortcut keys within four general categories:

1. CTRL+Shift+
2. CTRL+ 1-10
3. CTRL+ A-Z
4. Function Keys (F1-F12)

You may find that there are only a handful of shortcut keys you will use on a regular basis. Here is a list of some of the commonly used ones, along with a list of other shortcut key combinations you might find useful:

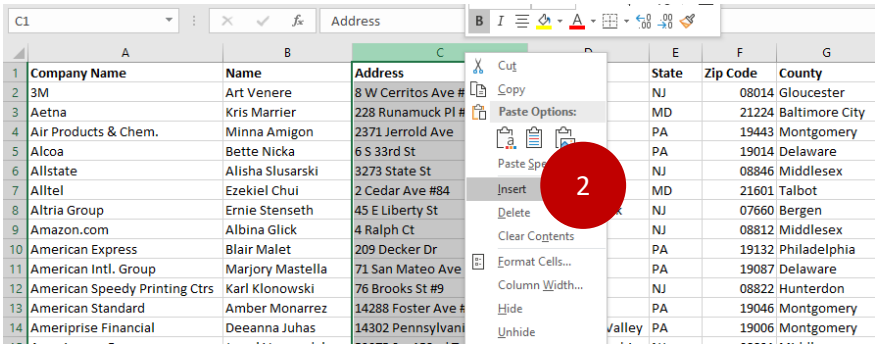
Task	Command
Open a new worksheet	SHIFT+F11
Open a new workbook	CTRL+N
Open an existing file	CTRL+O
Display worksheets from right to left	CTRL+PGDN
Display worksheets from left to right	CTRL+PGUP
Print a worksheet	CTRL+P
Save file currently open	CTRL+S
Create a Table	CTRL+T
Select an entire row or column	SHIFT+CTRL+arrow key
Open the Help menu	F1
Cut	CTRL+X
Copy	CTRL+C
Paste	CTRl+V
Past Special dialog box	CTRL+ALT+V
Hide the Ribbon	Double-click on tab currently open
Redisplay the ribbon	Click on any tab
Bold text	CTRL+B
Apply italics	CTRL+I
Underline text	CTRL+U
Insert a Table	CTRL+T
Insert Function dialog box	Shift+F3
Format cells dialog box	CTRL+SHIFT+F

Text to Columns

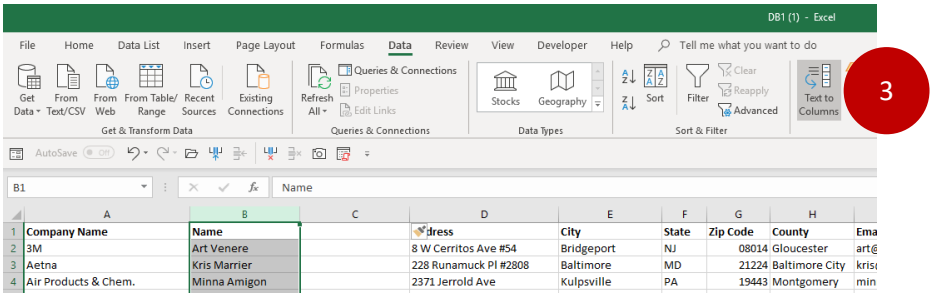
Text to Columns is an Excel Data Tool used to divide data into multiple columns. It could be data that's already in the worksheet, external data imported into Excel or data copied and pasted from another source, such as a web page. The Text-to-Column tools recognizes data as being either a Delimited file type or a Fixed Width file type.

Delimited File Type

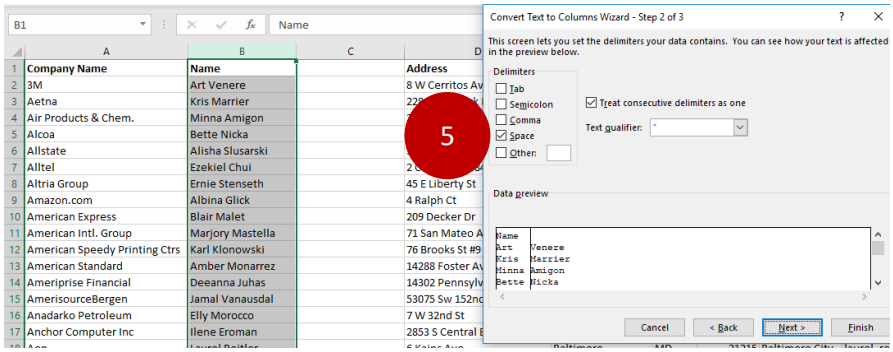
1. Click on column C.
2. Right-click, then click on Insert.



3. Click on Column B; click the Data tab; Choose Text to Columns.



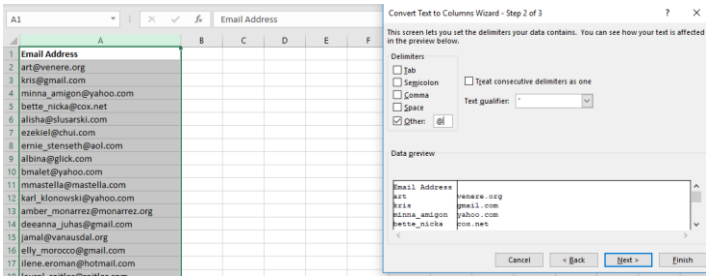
4. Delimited is already selected; click Next.
5. Uncheck Tab, check off Space; Click Finish.

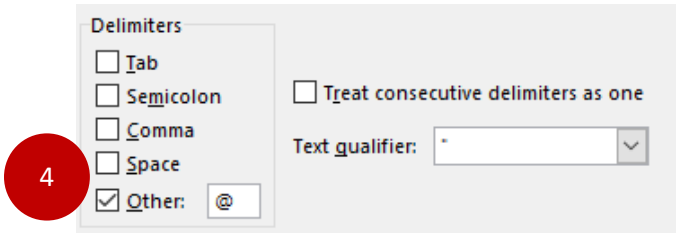


6. Click on cell B1; type "First Name"; Click on cell C1; type "Last Name".

Delimited using special characters

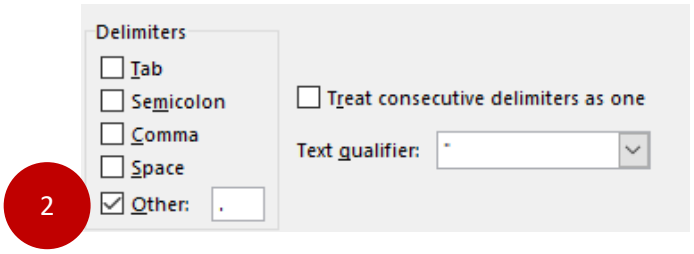
1. Click on Column A.
2. Text to Columns, Delimited; click Next.
3. Uncheck Space, check off Other.
4. Input the @ character, click Finish.





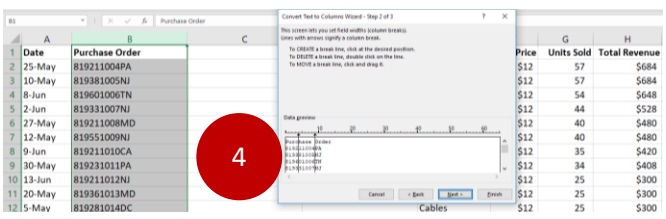
Delimited using a period

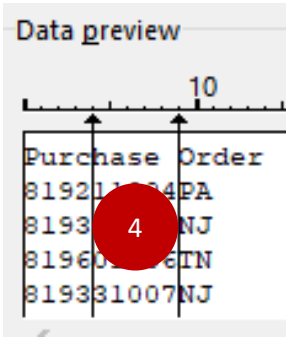
1. Click on the B column.
2. Delimited; input a period (.) in the Other space; Click Finish.
3. Input new column titles; Name, Provider, Domain Name.
4. Adjust the column widths.



Fixed Width File Type

1. Select columns C and D; right and choose Insert.
2. Select column B, go to Text to Columns.
3. Click on Fixed Width, click Next.
4. Add to Break Lines between the numbers and letters; click Finish.





Chapter 3: Using Cut, Copy and Paste

There are three different ways you can use the Cut/Copy/Paste tools:

1. Select data to be copied → click on the Home tab → Copy or Cut → click on cell where you want to copy the data → Home tab → Paste.

2. Select data to be copied → Right-click the mouse → choose Copy or Cut, click on the cell where you want to copy or cut the data → Home tab → Paste.

3. Select data to be copied → CTRL+C to copy or CTRL+X to cut → click on cell where you want to paste the data → CTRL+V → Paste.

You can also move data within a cell or an entire range of data without using the Copy/Paste tools:

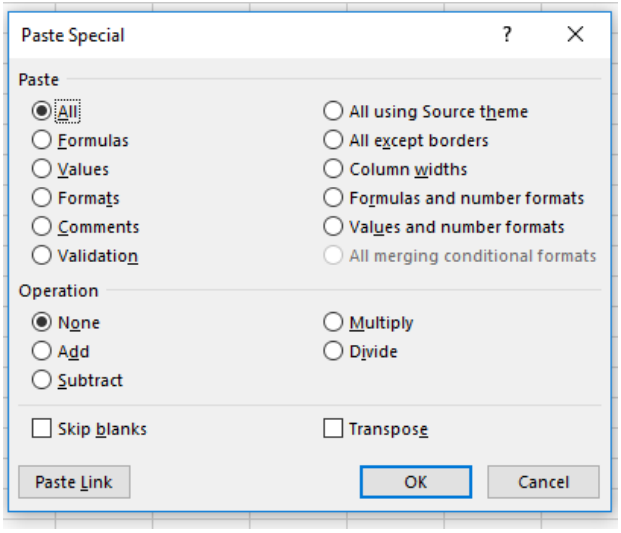
1. Select data range to be moved using the mouse key.
2. Position the mouse on the border surrounding the range until you see the four-arrow icon.
3. Left click the mouse and use it to move the data to the desired cells within the worksheet.

Paste Special

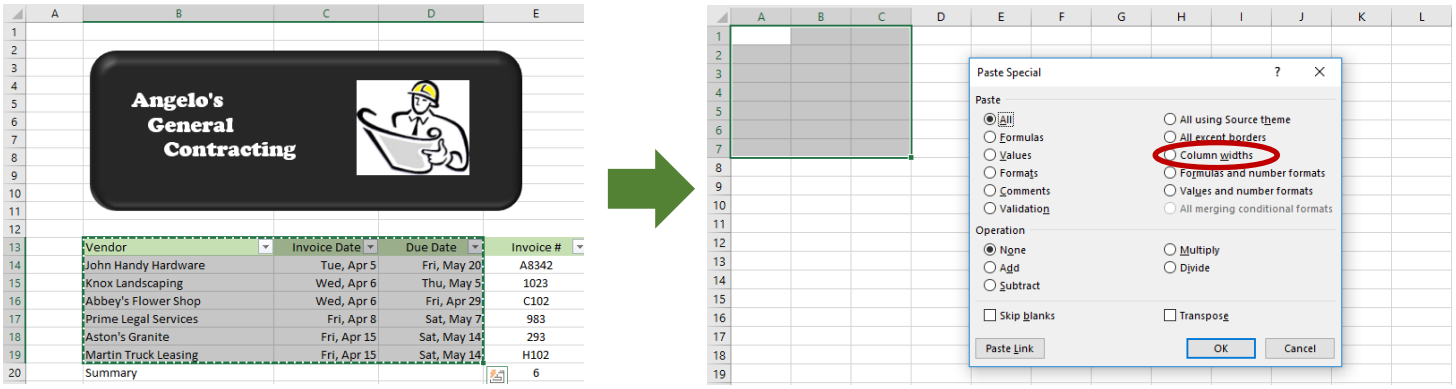
The Paste Special tools allows you to control how copied data is pasted into a cell or range of cells. The Dialog box can be accessed by selected the data to be copied, pressing CTRL+C, choosing the area where the data will be pasted, which in this case will be cells in a new worksheet. Press CTRL+ALT+V:

Paste Special Examples:

- **Formulas** – Will paste any formulas that are in the cells
- **Paste Values** – Will paste only the *calculated values* from the cells
- **No Borders** – Will paste the cells without the borders from the original cells
- **Transpose** – Change the orientation from vertical to horizontal or horizontal to vertical
- **Paste Link** – Creates a link between the pasted data to another cell in a worksheet



In this example, the column widths will be pasted first, so that they match the column widths of the original worksheet. To do this, click on Column widths, click OK and then press the Enter key:



Vendor	Invoice Date	Due Date	Invoice #
John Handy Hardware	Tue, Apr 5	Fri, May 20	A8342
Knox Landscaping	Wed, Apr 6	Thu, May 5	1023
Abbey's Flower Shop	Wed, Apr 6	Fri, Apr 29	C102
Prime Legal Services	Fri, Apr 8	Sat, May 7	983
Aston's Granite	Fri, Apr 15	Sat, May 14	293
Martin Truck Leasing	Fri, Apr 15	Sat, May 14	H102
Summary			6

The data will be pasted into the cells with the new column widths.

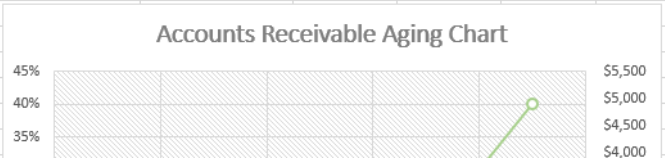
	A	B	C
1	Vendor	Invoice Date	Due Date
2	John Handy Hardware	Tue, Apr 5	Fri, May 20
3	Knox Landscaping	Wed, Apr 6	Thu, May 5
4	Abbey's Flower Shop	Wed, Apr 6	Fri, Apr 29
5	Prime Legal Services	Fri, Apr 8	Sat, May 7
6	Aston's Granite	Fri, Apr 15	Sat, May 14
7	Martin Truck Leasing	Fri, Apr 15	Sat, May 14

Transpose Data

The Transpose option in Paste Special when you have text or numbers aligned in one way (i.e., columns A1:H15) and you want to align then in a different way (i.e. rows A1:A15).

1. Select the data you want to Transpose; press CTRL+C.
2. Click on the cell where the data will be pasted; press CTRL+ALT+V.

Accounts Receivable Aging Report	Totals:	Not Yet Due	1 - 30 days due	31-60 days past due	61 - 90 days past due	Over 90 days past due
Accounts receivable balance	$ 6,000	$ 3,000	$ 1,320	$ 1,080	$ 420	$ 180
Total % chance of default	n/a	2%	4%	10%	20%	40%
Total estimate of bad debt	$ 377	$ 60	$ 53	$ 108	$ 84	$ 72

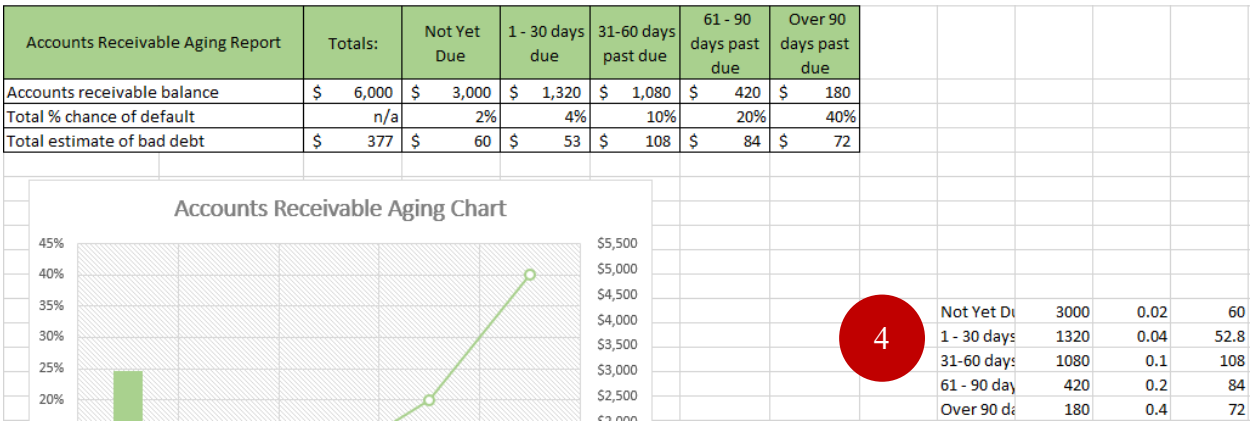


1

2

3. Check off Transpose and Values, so that only numbers are pasted, click OK.

4. You can then adjust the column widths and number formats. In this example the company wants to cut the transposed data and paste it into an Email message.

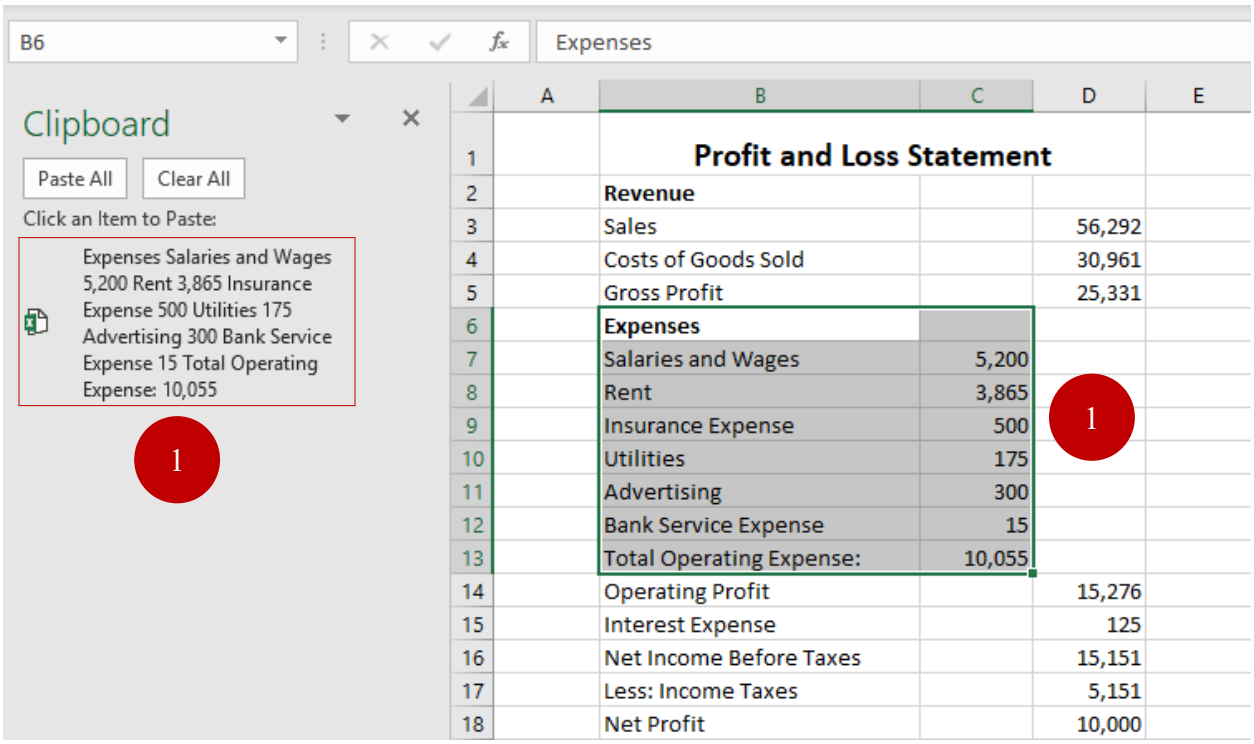


Accounts Receivable Aging Report	Totals:	Not Yet Due	1 - 30 days due	31-60 days past due	61 - 90 days past due	Over 90 days past due
Accounts receivable balance	$ 6,000	$ 3,000	$ 1,320	$ 1,080	$ 420	$ 180
Total % chance of default	n/a	2%	4%	10%	20%	40%
Total estimate of bad debt	$ 377	$ 60	$ 53	$ 108	$ 84	$ 72

Using the Clipboard

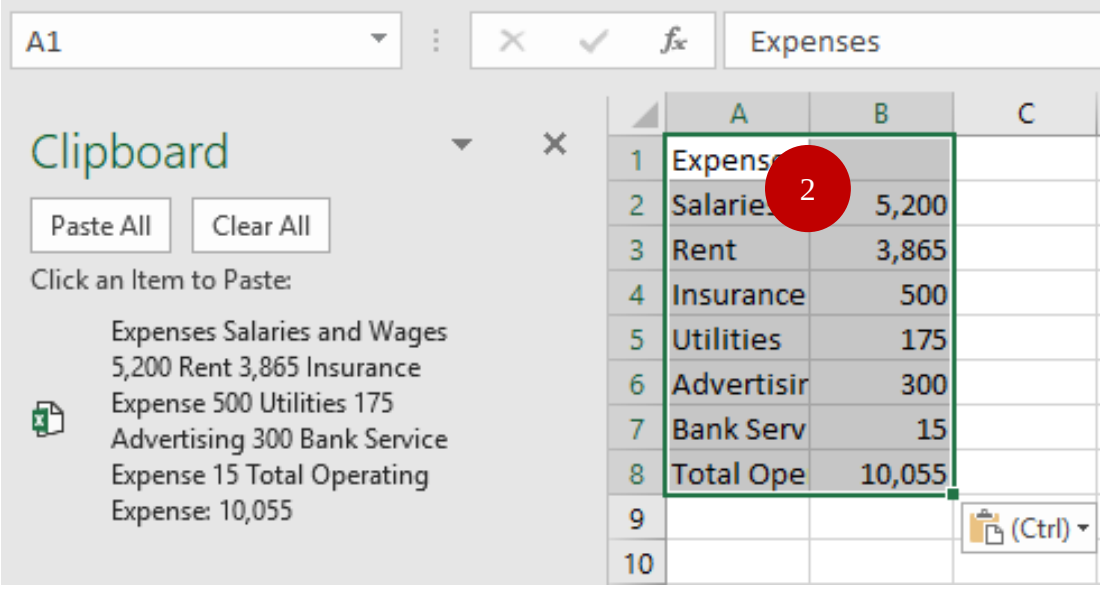
Worksheet data that is cut or copied is automatically placed onto the **Office Clipboard,** which will allow you to paste the data multiple times into different areas of a worksheet or into other office applications. The clipboard holds a maximum of 24 items. In this example, we want to copy and paste the expenses from an income statement onto another worksheet.

1. Select the data and press CTRL+C; the copied data will now appear in the Office Clipboard.



	A	B	C	D	E
1		**Profit and Loss Statement**			
2		**Revenue**			
3		Sales		56,292	
4		Costs of Goods Sold		30,961	
5		Gross Profit		25,331	
6		**Expenses**			
7		Salaries and Wages	5,200		
8		Rent	3,865		
9		Insurance Expense	500		
10		Utilities	175		
11		Advertising	300		
12		Bank Service Expense	15		
13		Total Operating Expense:	10,055		
14		Operating Profit		15,276	
15		Interest Expense		125	
16		Net Income Before Taxes		15,151	
17		Less: Income Taxes		5,151	
18		Net Profit		10,000	

2. Press CTRL+N to create a new workbook, then click on the data in the clipboard. Adjust the width of the columns as needed. In this example, you can double-click between columns A and B to make column A wider.



Chapter 4: Formulas and Functions

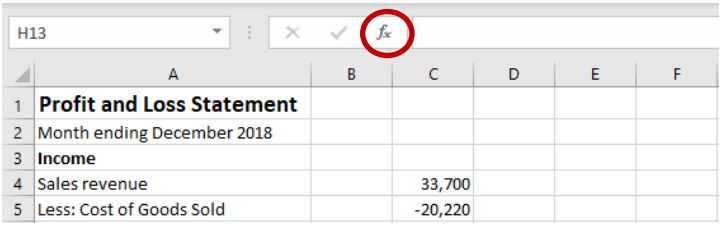
Formulas and functions are used to tell Excel how to perform calculations or execute commands on inputted data. A **formula** is a statement that performs calculations based on:

- Constants: =1+2+3
- Cell References: = A1 + B1 + C1
- A combination of both: = A10 + 15

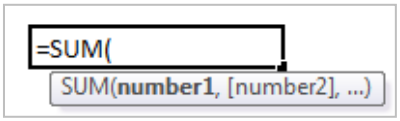
To enter a formula, you would start by inputting an equal sign, followed by a combination of numbers and operators; addition (+), subtraction (-), multiplication (*) or division (/). You can also separate numbers with an exponent using the ^ sign (i.e. =3^3, which would display the number 27).

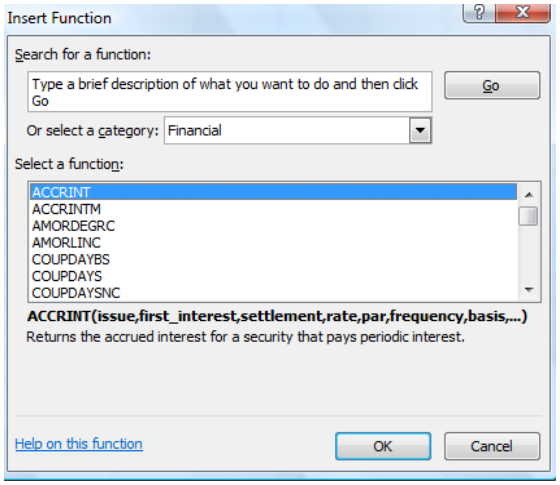
A **function** has formulas built into it and can represent multiple calculations. Instead of typing in =A1+A2+A3, for example, you can input =SUM(A1:A3). The =SUM represents the **Function Name** and the cell references (A1:A3) represent the **Function Arguments.** The layout and order used to input the function name and function arguments into a cell is referred to as **syntax.**

Formulas and functions can be entered directly into a cell in the worksheet or into the **formula bar.** If you are not sure of how to perform a calculation, you can click on the Insert Function button to open a dialog box.



There are over 300 functions in Excel, divided between 12 different function categories. When you click on each function, you'll see a description of what it is does and how it works. Functions are activated when you start typing the function name into a cell. If you want to use the SUM function, for example, you can start typing =SUM into a cell and then **press the Tab key.** The function name will appear, along with a description of what will be calculated (the function arguments):





You can then input the numbers or click on the cells to be used to do the calculation.

Inputting Formulas

Here's an example of a company that sells computers and supplies to retail stores. They know what their cost and markup percentage is for each product. A worksheet needs to be created that automatically calculates what the sale price would be to the retailer:

East Coast Supplier, Inc

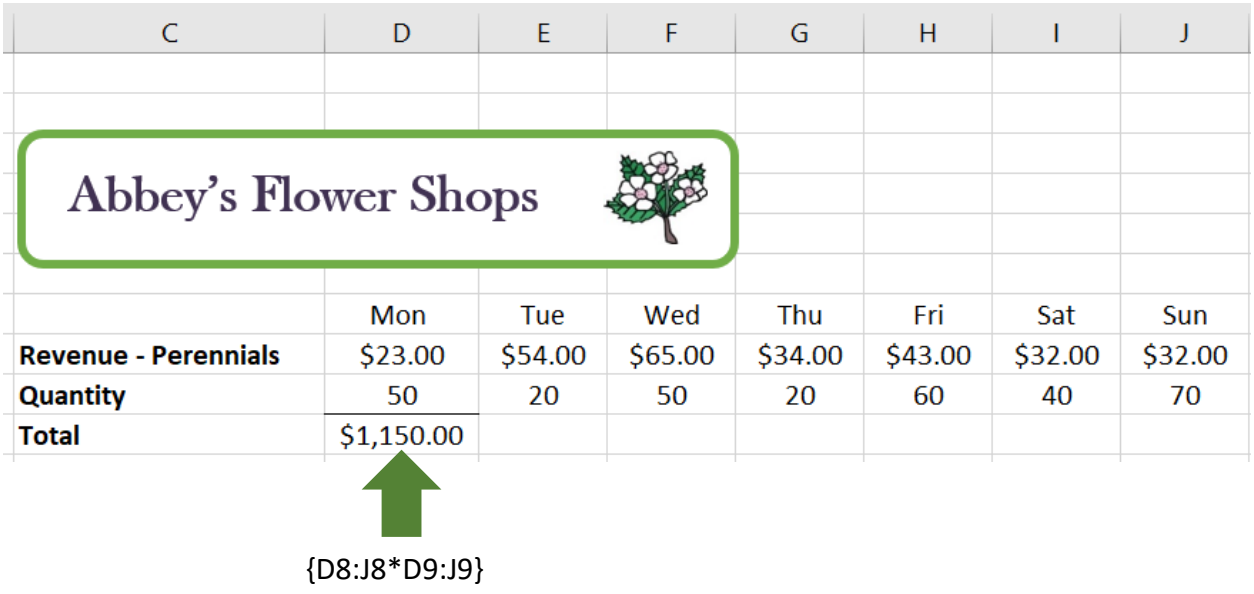
Product	Cost from Manufacturer	Product Code	Markup	Sale Price to Retail	
Desktops	65.00	12ER3	20%	78.00	=C4*(1+E4)
Laptops	40.00	43TR1	24%	49.60	=C5*(1+E5)
Cables	95.00	67DE2	75%	166.25	=C6*(1+E6)
Printers	120.00	84HG5	45%	174.00	=C7*(1+E7)
Tablets	65.00	77DC3	125%	146.25	=C8*(1+E8)
Speakers	35.00	98LK5	80%	63.00	=C9*(1+E9)

Formulas were inputted to do the following calculation: Cost x (1+Markup).

Array Formulas

There may be times when you have Excel worksheets that are not formatted in a way that makes it easy to perform calculations. In this example, we want to multiply a range (array) of numbers with another range of numbers. If we try to do this without using an Array formula, you might get an error message (#VALUE).

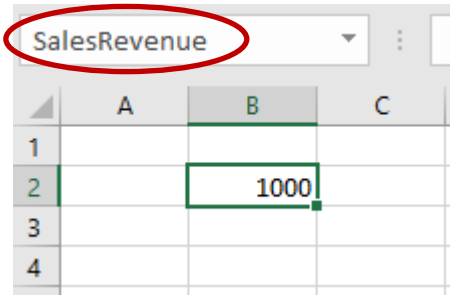
To input an Array formula in this example, you would select cells D8 to J8, input the operator (*), then select cells D9 to J9. To input the Array formula, hold down the SHIFT+CTRL keys, then press Enter. If you're using the latest version of Office 365, you can input the array formula by just selecting the cell and pressing Enter.



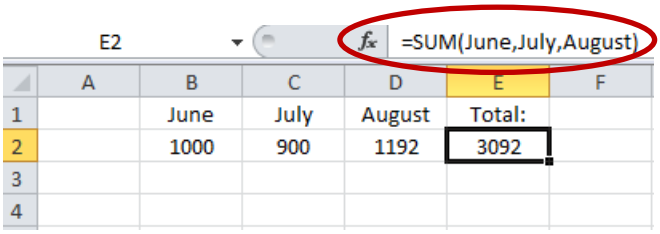
Naming a Cell

If you're creating a worksheet that has more complex formulas, you may want to use **named cell references.** This means that when you click on a cell in a worksheet, you'll see text instead of cell references. For example, =C4*(1+E4) can be made to appear as =Cost*(1+Markup).

Type a number into a cell, then type a name into the name box; press Enter. The cell name will appear in the name box. The cell name cannot start with a number and should be a single word, two or more words separated by underscores or a name that uses both upper and lower case letters.



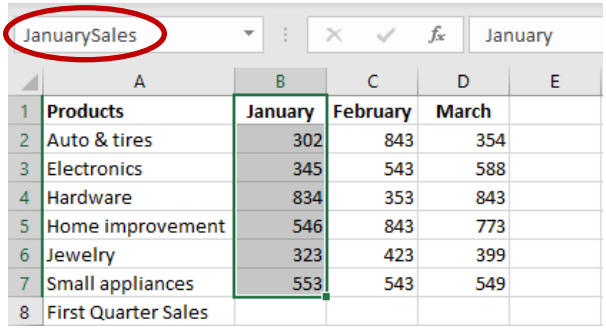
Named cells can be used to perform calculations. For example, numbers can be added together by using the SUM function and the assigned cell names, separated by a comma. If more than one word will be used to name a cell, you can combine them using a mixed case, such as SalesJune, SalesJuly, etc.

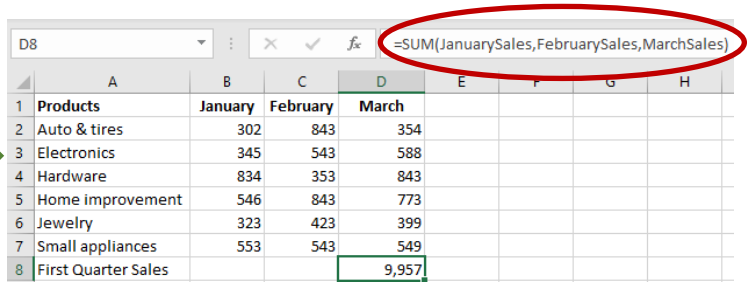


Naming a Range of Cells

In addition to naming individual cells, you can also name a range of cells and perform calculations using those names. In this next example, we want to find an easy way to add the numbers in columns B through D and input the grand total into cell D8.

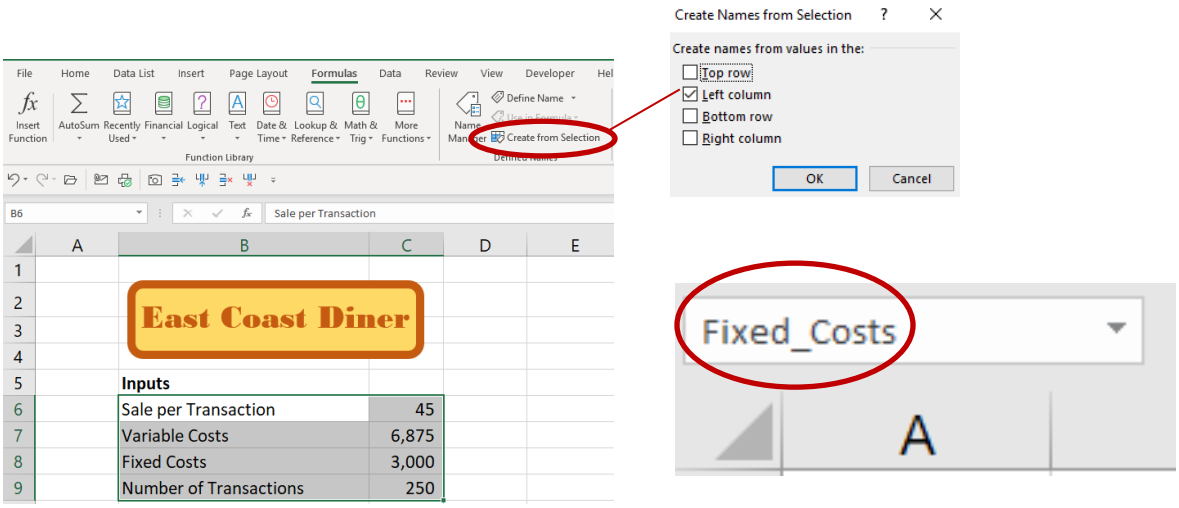
You would use the mouse to select the cells to be included in the name range. Click on the Name Box and name the range (JanuarySales). Then input the SUM function into cell D8:



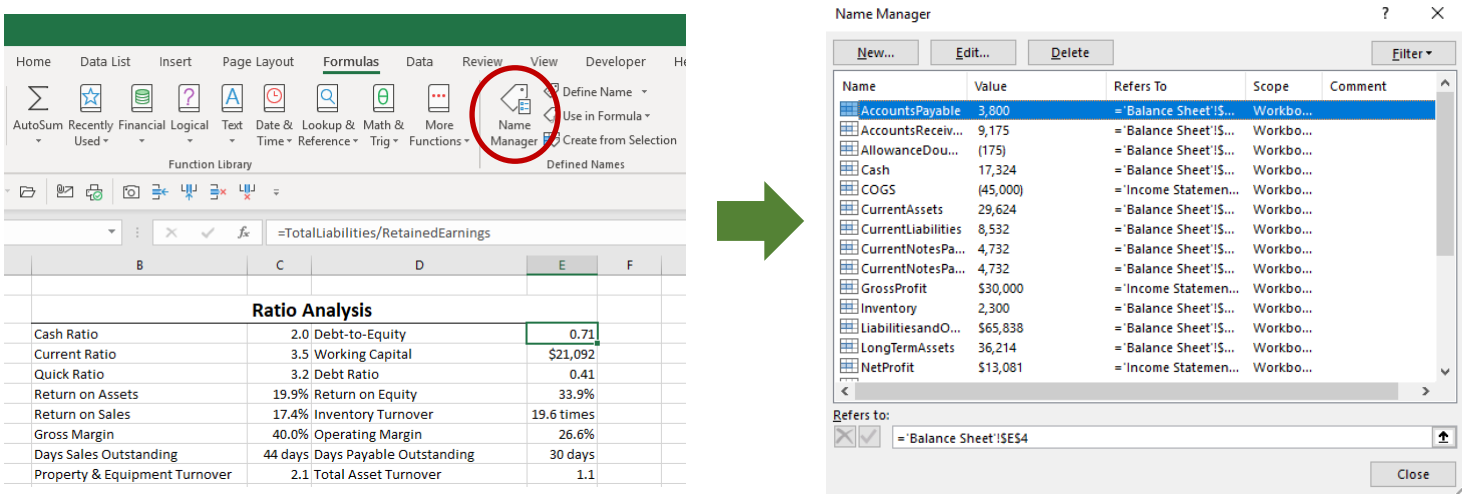


Named cell references can be automatically created using a tool called **Create from Selection**, if the column or row labels are next to the cells that you want to add names to. Select the cells, then click on the Formulas tab. Click on Create from Selection.

You'll see that the Left column is selected as the default; click OK. The named cell reference was created using an underscore to separate the words in the cell:



Individual cells or a range of cells that have assigned names are stored in what's called the Name Manager, which can be accessed by clicking on the Formula tab, then clicking on Name Manager:



Let's now look at seven different function categories.

Math Functions

Math functions can be used to perform very basic calculations (addition, subtraction, etc.) or combined with multiple formulas and functions. Here are some examples:

SUM

The SUM function is used to add numbers using inputted values, individual cells or a range of cells. Let's look at three examples. Adding rows or columns of numbers (C3:E3), adding a single range of numbers (C3:E8) and adding multiple ranges of numbers (C4:E4, C8:E8).

Two or more ranges of cells can be added to together by inputting the SUM function, selecting the range, inputting a comma and then selecting additional ranges. To add the values from Electronics and Small Appliances, for example, you would input =SUM(C4:E4,C8:E8).

Department Revenue ($000's)	January	February	March	Totals
Auto	302	843	354	=SUM(C3:E3)
Electronics	375	543	588	=SUM(C4:E4)
Hardware	834	353	843	=SUM(C5:E5)
Home Improvement	546	843	773	=SUM(C6:E6)
Jewelry	323	423	399	=SUM(C7:E7)
Small Appliances	553	543	539	=SUM(C8:E8)
Total:				
Quarter 1 Sales	=SUM(C3:E8)			
Electronics and Small Appliances	=SUM(C4:E4,C8:E8)			

SUMIF

The SUMIF function is used when you need to add numbers in a column that meet a specific criterion. If you click on cell D2 for example, you can input the SUMIF function to add the expense numbers. Column A will be where you select the range of data, C2 is the data you're looking for within that range (Regular Mail) and column B is the range of numbers that you want to search. In other words, you're telling Excel that you only want to see the grand total of expenses for Regular Mail. You can then repeat these steps for Express Mail.

	A	B	C	D	E	F
1	**Postage Expense Journal**					
2	**Type**	**Expense**	**Regular Mail**	4,122	=SUMIF(A:A,C2,B:B)	
3	Regular Mail	448				
4	Express Mail	577	**Express Mail**	7,857	=SUMIF(A:A,C4,B:B)	
5	Express Mail	519				

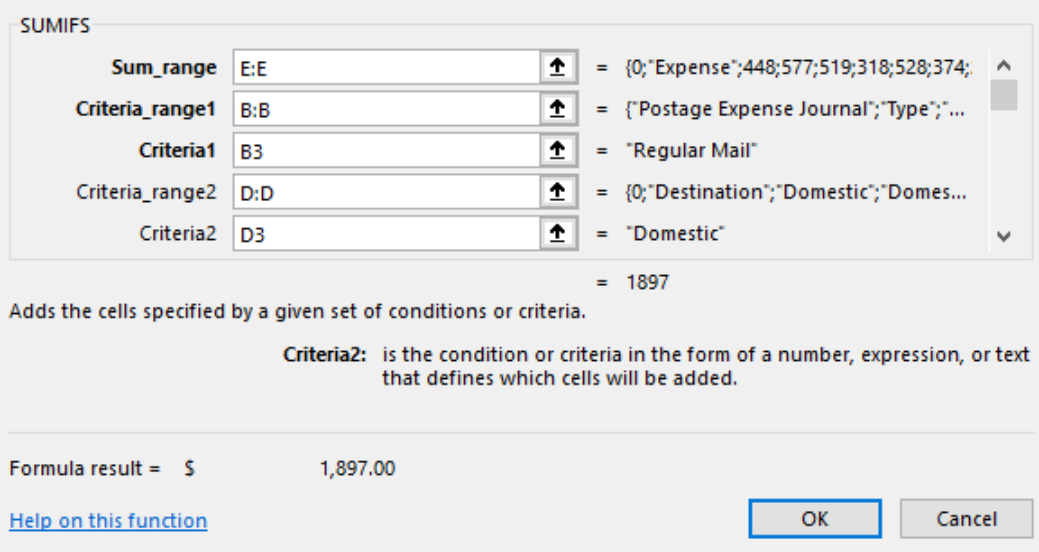
SUMIFS

This function is used when you have multiple criterion being used to produce results:

G2 =SUMIFS(E:E,B:B,B3,D:D,D3)

	A	B	C	D	E	F	G	H
1		**Postage Expense Journal**					**Total**	**Average**
2		**Type**	**Size**	**Destination**	**Expense**	**Domestic Regular Mail**	$1,897.00	$ 237.13
3		Regular Mail	Small	Domestic	448			
4		Express Mail	Medium	Domestic	577	**Domestic Express Mail**	$6,956.00	$ 869.50
5		Express Mail	Large	Domestic	519			
6		Regular Mail	Small	International	318	**International Regular Mail**	$2,225.00	$ 445.00
7		Express Mail	Medium	International	528			
8		Regular Mail	Large	International	374	**International Express Mail**	$ 901.00	$ 300.33

This is how the cell references would be inputted into the Function Arguments dialog box:



Each space in the Function Arguments dialog box is asking a question:

Function Argument	**Question to ask:**
Sum_range	Where should I look? (column E, the Expense column)
Criteria_range1	What should I look for? (the information in column B)
Criteria1	What should I look for in Column B (the words “Regular Mail”)
Criteria_range2	What should I look for? (the information in column D)
Criteria2	What should I look for in Column D (the word “Domestic”)

PRODUCT, SUMPRODUCT and QUOTIENT

Here is an example of how math functions can be used to help a business make decisions about inventory. SUMPRODUCT uses what’s called an Array to perform two operations. It will first add the numbers in each array (J5:J8 and K5:K8), then it will multiple the result.

Weighted Average					
Purchase Date:	Qty	Cost			
1-Jan	70	35			
5-Jan	50	34			
12-Jan	90	34			
25-Jan	100	37			
Total:	310	10,865	=SUMPRODUCT(J5:J8,K5:K8)		
Ending Inventory	120				
Inventory value:					
Weighted Average Cost		35	=QUOTIENT(K9,J9)		
Weighted Average Inventory		4,200	=PRODUCT(J10,K13)		

Financial Functions

PMT, NPER, RATE and PV

These functions can be useful whenever a major purchase or investment is going to incur finance charges. This example shows a business owner that created a template that answers four questions:

B	C	D	E	F	G	H	I	J
		Debt Calculator						
Loan Amount	$ 16,643	**Input**						
Interest Rate	9%	**Input**						
Number of Payments	72	**Input**						
Monthly Payment	($300.00)	**PMT**	=PMT(C4/12,C5,C3)		What are my monthly payments?			
Loan Amount	$ 16,643	**Input**						
Interest Rate	9%	**Input**						
Number of Payments	72	**NPER**	=NPER(C9/12,C11,C8)		How many payments will I need to make?			
Monthly Payment	($300.00)							
Loan Amount	$ 16,643	**Input**						
Interest Rate	9.0%	**RATE**	=RATE(C15,C16,C13)*12		What will my interest rate be?			
Number of Payments	72	**Input**						
Monthly Payment	($300.00)							
Loan Amount	$ 16,643	**PV**	=PV(C19/12,C20,C21)		How much money can I borrow?			
Interest Rate	9.0%	**Input**						
Number of Payments	72	**Input**						
Monthly Payments	($300.00)	**Input**						

PPMT and IPMT

The PPMT and IPMT functions will tell you how much of a monthly payment is going towards the **principal** and how much is going towards **interest.** You can input an equal sign follow by a minus sign so that the result will display a positive number:

B	C	D	E	F
Calculate PPMT & IPMT				
Loan amount	$ 30,000			
Payment #	10			
Number of payments	60			
Interest rate	9.0%			
Amount paid towards principal	$425.42	=-PPMT(C6/12,C4,C5,C3)		
Amount paid towards interest	$197.33	=-IPMT(C6/12,C4,C5,C3)		

NPV and IRR

Businesses will often have to evaluate whether major financial investment is worth pursuing and how much it will cost. It may be as simple as writing a check to make the investment. Some investments, however, may require that the business get a bank loan or credit line that comes with the expense of paying interest. The NPV and IRR functions are used help people make decisions about those investments.

Here's an example of a daycare center that wants to move into a new facility. The cost to pay for renovations and other moving expenses will be $19,750. They expect to increase their operating income (cash flow) by $5,000 per year over the next five years if they get a bank loan that comes with an 8.7% interest rate (which is sometimes referred to as a required rate of return):

	A	B	C	D	E
1					
2					
3		**Bright Hopes Early Learning Center**			
4					
5					
6					
7					
8		**Bank Loan Interest Rate**	8.7%		
9		**New Facility Investment**	-$19,750		
10		Year 1 Cash flow	5,000		
11		Year 2 Cash flow	5,000		
12		Year 3 Cash flow	5,000		
13		Year 4 Cash flow	5,000		
14		Year 5 Cash flow	5,000		
15		Net Present Value	-$149.41	=C9+NPV(C8,C10:C14)	
16		Actual Rate of Return	8.4%	=IRR(C9:C14)	

The NPV and IRR functions were used to show the business owner that the Net Present Value, which is the value of the investment after the interest rate is considered, is a negative number. You'll also notice that the Actual Rate of Return or 8.4% (IRR) is less than the bank loan interest rate of 8.7% (this is sometimes referred to as the cost of capital).

XNPV and XIRR

B	C	D	E	F
Project Timeline				
Date	Cash Flow			
1/15/20	(28,937)			
3/15/20	3,000			
6/15/20	4,000			
9/15/20	5,000			
1/15/21	7,000			
3/15/21	7,500			
6/15/21	8,000			
Required rate of return	24.0%			
Net Present Value (XNPV)	$ (675)	=XNPV(C11,C4:C10,B4:B10)		
Internal Rate of Return (XIRR)	20.8%	=XIRR(C4:C10,B4:B10)		

The XNPV and XIRR functions use specific dates (1/15/20, 3/15/20, etc.) instead of fixed time frames (Year 1, Year 2, etc.) as function arguments to determine the Net Present Value and Internal Rate of Return. In this example, the business is expecting a high rate of return but must also pay a higher rate of return.

CUMPRINC and CUMIPMT

The CUMPRINC and CUMIPMT functions will tell you how much of your monthly payment is going towards the principal and how much is going towards interest within a specific period of time. If you wanted to know what the principal and interest payment would be for the second year of the loan, for example, the starting period would be 13 and the ending period would be 24. To calculate the total interest expense paid on a five-year loan, you would input 1 for the starting period and 60 for the ending period:

Loan amount	25,000	
Number of payments	60.00	
Interest rate	9.0%	
Starting period	1	
Ending period	60	
Payment Amount	518.96	=-PMT(C5/12,C4,C3)
Principal amount paid during this period:	25,000	=-CUMPRINC(C5/12,C4,C3,C6,C7,0)
Interest amount paid during this period:	6,137.53	=-CUMIPMT(C5/12,C4,C3,C6,C7,0)

FV

Financial functions can also be used to calculate the interest earned on an investment. A template can be created based on the questions you want Excel to answer. For example, you can ask, “what is the estimated value of my retirement account in 18 years?”

B	C	D	E
Future Value of Retirement Account			
Rate of return	7.50%		
Time until retirement	18 years		
Present value of monthly payments	500		
Estimated retirement account value	$ 227,300	=FV(C3/12,C4*12,-C5)	

For many of the financial functions, it’s easier to input the function (i.e., =PMT), press the Tab key, then open the Function Arguments dialog box to enter the function arguments, as opposed to typing the function arguments directly into the cell.

Statistical Functions

AVERAGE, MIN and MAX

This group of statistical functions will provide information about a range of numbers. The data can then be evaluated to see if the numbers reveal information that can be used to make decisions.

Small Appliances	10,312	8,241		
Sports & Fitness	9,231	14,232		
Toys	2,923	4,034		
Total:	**307,804**	**339,243**	**=SUM(C4:C17)**	**=SUM(D4:D17)**
Average Values	21,986	24,232	=AVERAGE(C4:C17)	=AVERAGE(D4:D17)
Highest Values	82,324	80,513	=MAX(C4:C17)	=MAX(D4:D17)
Lowest Values	2,242	2,278	=MIN(C4:C17)	=MIN(D4:D17)

COUNTA and COUNTIF

Statistical functions are also used to produce results based on data as opposed to dollar amounts. The COUNTA function is used to calculate the number of spaces in a range that aren't blank; the COUNTIF function is used to count the number of times a string of text (i.e. Marketing) appears within a range of cells:

Today's Date:		
Average Tenure	13 years	=AVERAGE(G3:G36)
Number of Employees:	34	=COUNTA(B3:B36)
Marketing	5	=COUNTIF(C:C,J6)
Production	6	=COUNTIF(C:C,J7)
Administration	2	=COUNTIF(C:C,J8)
Tech Support	8	=COUNTIF(C:C,J9)
Sales	13	=COUNTIF(C:C,J10)

Employee List

Name	Department	DOB	Age	Start Date	Tenure	M/F
Anan, Nancy	Marketing	4/5/1965	52	9/4/08	9	F
Williams, Annette	Production	3/2/1949	69	12/3/07	10	F
Bertucci, Betty Anne	Marketing	5/29/1981	36	11/2/04	13	F
Biggs, Bill	Administration	5/2/1974	43	1/6/10	8	M
Seagar, Bill	Tech Support	9/18/1974	43	2/20/03	15	M
Smith, Aarnold	Tech Support	5/3/1966	51	2/22/99	19	M
White, Jackie	Tech Support	5/5/1965	52	5/2/05	12	F
Carpenter, Brian	Administration	6/2/1965	52	4/2/01	16	M

Today's Date:		
Average Tenure	13 years	=AVERAGE(G3:G36)
Number of Employees:	34	=COUNTA(B3:B36)
Marketing	5	=COUNTIF(C:C,J6)
Production	6	=COUNTIF(C:C,J7)
Administration	2	=COUNTIF(C:C,J8)
Tech Support	8	=COUNTIF(C:C,J9)
Sales	13	=COUNTIF(C:C,J10)

The COUNTA and COUNTIF functions can also be inputted using a text string without referencing a cell address (i.e. type "Underperformed") and can be combined with formulas:

```
=COUNTIF(I7:I20,"Underperformed")
=K6/COUNTA(B7:B20)
```

Rob's Discount Furniture

% of Sales Goal Achieved by Store Location

Store Number	Rank	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Average	Result
Albany 10	10	90%	121%	88%	72%	93%	Underperformed
Rochester 20	11	97%	93%	90%	86%	92%	Underperformed
Lancaster 30	3	142%	102%	92%	94%	108%	Good Standing

Results		
Number of stores that underperformed	5	=COUNTIF(I7:I20,"Underperformed")
Percentage of stores that underperformed	36%	=K6/COUNTA(B7:B20)

Logical Functions

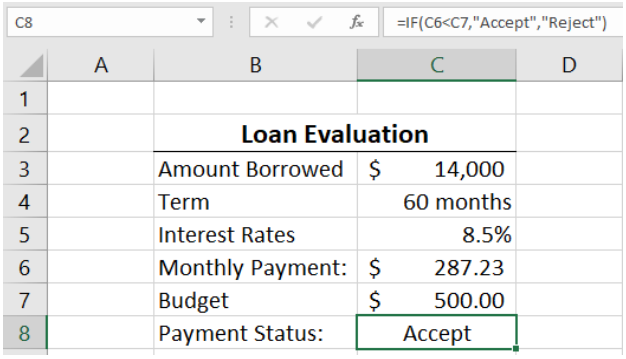
These functions are used to test the values of one or more cells and will produce a result based on the function arguments inputted. Like other Excel functions, they can be used to return a result based on numbers inputted into cells or combined with multiple formulas and functions. Logical functions can also display text based on whether the result is true, or the result is false.

IF

Here are three examples of how the IF function can be inputted:

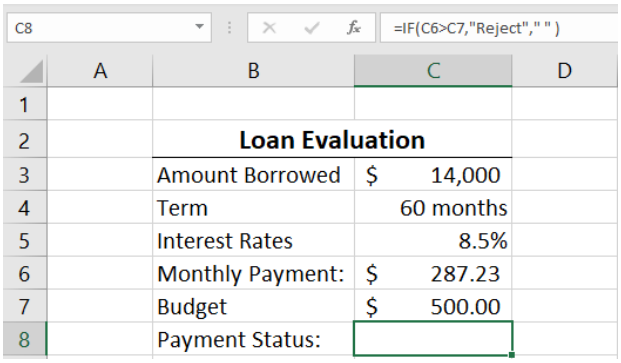
a. True or False: If the monthly payment amount is less than the Budget, the word “Accept” appears; if it’s less, the word “Reject” Appears.

=IF(C6<C7,”Accept”,”Reject”)



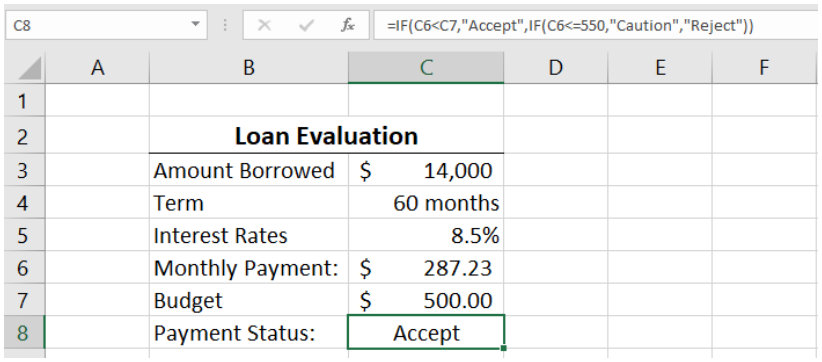
b. Blank if False: If the budget amount is higher than the payment, the word “Reject” appears; if not, the cell is left blank (cell C8).

=IF(C6>C7,”Reject”,””)



c. Nested IF function: This can be used when two or more conditions are inputted.

=IF(C6<C7,”Accept”,IF(C6<=500,”Caution,”Reject”))



IFERROR

The IFERROR function can be inputted in front of other functions to prevent error messages from appearing. This worksheet has the AVERAGE function inputted into the cells in column H but the cells in row 8 do not any numbers yet. If =AVERAGE is inputted into the cell H8, the error message #DIV/0! will appear:

	A	B	C	D	E	F	G	H	I
1									
2		Sales Performance Commission Payout							
3		Sales Representative	10-Sep	17-Sep	24-Sep	1-Oct	Total	Average Sale	Commission Earned
4		George Johnson	300.00				300.00	300.00	60.00
5		Tammy Reid	500.00				500.00	500.00	100.00
6		Jason Madison	200.00				200.00	200.00	40.00
7		David Cooper	500.00				500.00	500.00	100.00
8		Phil Moore					-	#DIV/0!	-

This means that there are empty cells being referenced in the function arguments. IFERROR can be inputted to say that if an error message appears in the cell, leave it blank; otherwise, perform the calculation using the AVERAGE function: =IFERROR(AVERAGE(C4:F4),"")

H4 =IFERROR(AVERAGE(C4:F4),"")

	A	B	C	D	E	F	G	H	I
1									
2		Sales Performance Commission Payout							
3		Sales Representative	10-Sep	17-Sep	24-Sep	1-Oct	Total	Average Sale	Commission Earned
4		George Johnson	300.00				300.00	300.00	60.00
5		Tammy Reid	500.00				500.00	500.00	100.00
6		Jason Madison	200.00				200.00	200.00	40.00

AND and OR

There may be times when you want to create a template that has more complex criterion. In this example, a company wants to offer a discount to their clients but only if certain conditions are met:

All customers that spend more than $500 or place an order for more than 25 units will receive a 15% discount. If neither of these conditions are met, a 0 will be inputted

The IF function would be entered first, followed by the OR function, the first condition, the AND function, then the second condition. You would then input two parentheses, a comma and the Subtotal times the discount of 15%: =IF(OR(F3>500,AND(E3>25)),F3*0.15,0)

G3 =IF(OR(F3>500,AND(E3>25)),F3*0.15,0)

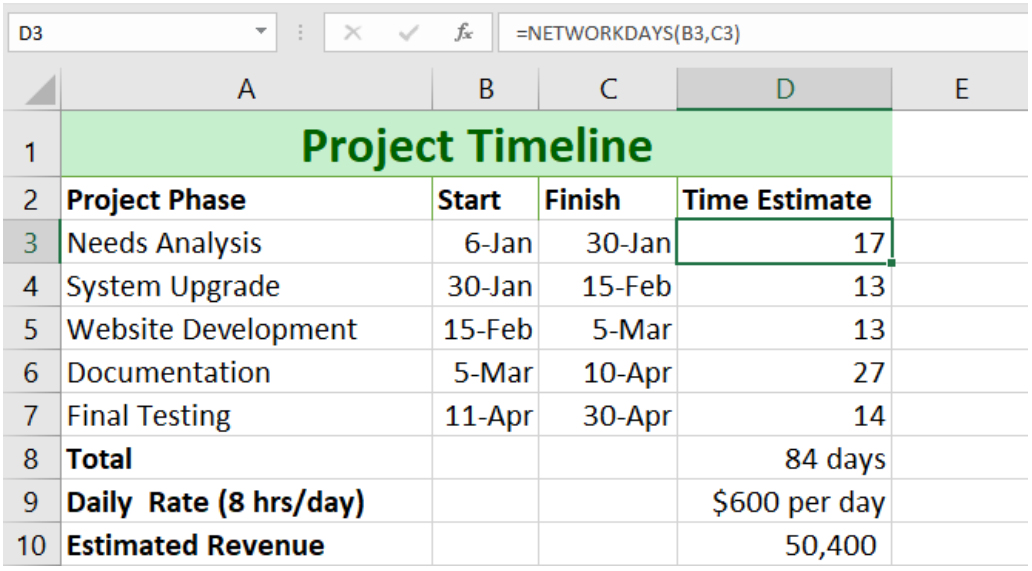
	B	C	D	E	F	G	H
1	Retail Purchase Order						
2	Description	Product Code	Price	Quantity	Subtotal	Discount	Total
3	Rice	RI923	2.56	26.00	66.56	9.98	56.58
4	Flour	CF 928	5.65	26.00	146.90	22.04	124.87
5	Flour	RI923	4.50	26.00	117.00	17.55	99.45
6	Beans	RI923	2.35	14.00	32.90	0.00	32.90

Date and Time Functions

NETWORKDAYS

A company or individual that needs to provide job cost estimates can use this function to estimate the amount of time needed to complete a job. The NETWORKDAYS function calculates the number of working days between two dates and excludes weekend dates. You can also choose to exclude holidays:

=NETWORKDAYS(B3,C3)

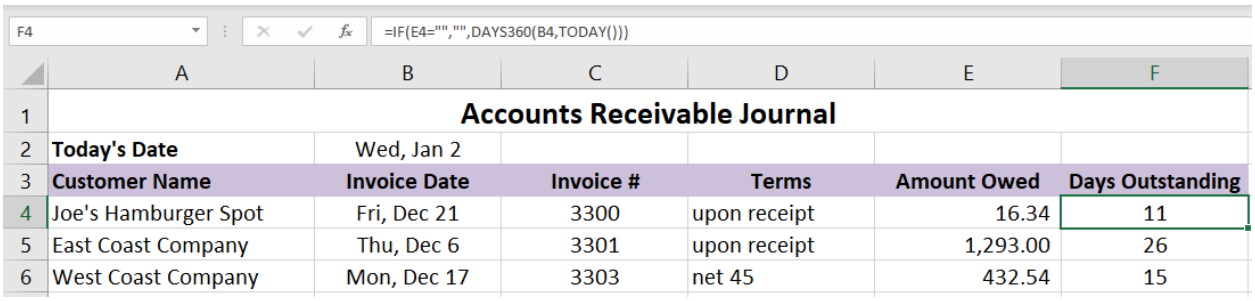


	A	B	C	D	E
1	**Project Timeline**				
2	**Project Phase**	**Start**	**Finish**	**Time Estimate**	
3	Needs Analysis	6-Jan	30-Jan	17	
4	System Upgrade	30-Jan	15-Feb	13	
5	Website Development	15-Feb	5-Mar	13	
6	Documentation	5-Mar	10-Apr	27	
7	Final Testing	11-Apr	30-Apr	14	
8	**Total**			84 days	
9	**Daily Rate (8 hrs/day)**			$600 per day	
10	**Estimated Revenue**			50,400	

DAYS360

This function calculates the number of calendar days between two time periods. In this example, DAYS360 was combined with two other functions. The IF function was inputted into cell F4 so that the function could be Autofilled to the other cells in column F. The cells will remain blank until a number is inputted into a cell in column E. The TODAY function was inputted so that the current date will always show the number of calendar days between the current date and the Invoice date (i.e. B4).

=IF(E4="","",DAYS360(B4,TODAY()))

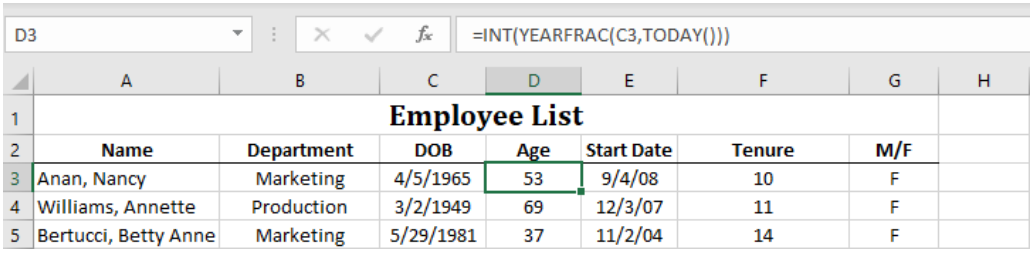


	A	B	C	D	E	F
1	**Accounts Receivable Journal**					
2	**Today's Date**	Wed, Jan 2				
3	**Customer Name**	**Invoice Date**	**Invoice #**	**Terms**	**Amount Owed**	**Days Outstanding**
4	Joe's Hamburger Spot	Fri, Dec 21	3300	upon receipt	16.34	11
5	East Coast Company	Thu, Dec 6	3301	upon receipt	1,293.00	26
6	West Coast Company	Mon, Dec 17	3303	net 45	432.54	15

YEARFRAC

The YEARFRAC function returns the number of years between two time periods. The TODAY function is being used in this example and is combined the math function INT, which rounds down the result to the nearest whole number:

=INT(YEARFRAC(C3,TODAY()))



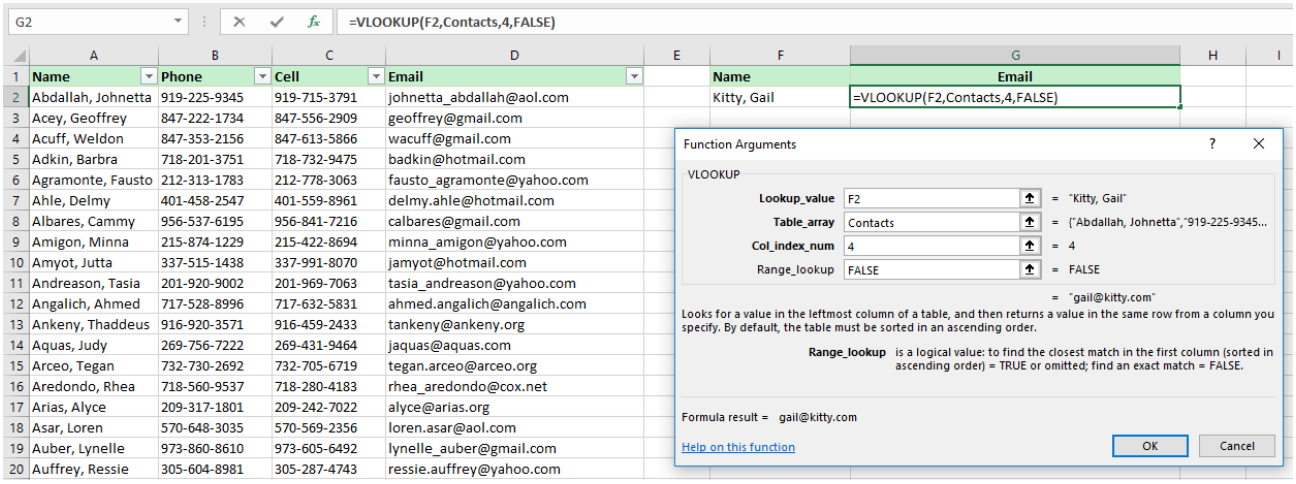
	A	B	C	D	E	F	G	H
1	Employee List							
2	Name	Department	DOB	Age	Start Date	Tenure	M/F	
3	Anan, Nancy	Marketing	4/5/1965	53	9/4/08	10	F	
4	Williams, Annette	Production	3/2/1949	69	12/3/07	11	F	
5	Bertucci, Betty Anne	Marketing	5/29/1981	37	11/2/04	14	F	

Lookup and Reference Functions (VLOOKUP)

This function is used when you need an easy way to retrieve data from a large worksheet. Here's an example of a data list with 500 names and VLOOKUP is being used to retrieve email addresses. The Function Arguments dialog box can be used to input four arguments:

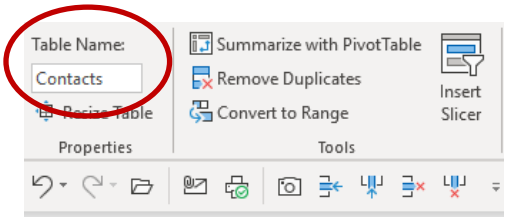
Function Argument	Description
Lookup_value	The cell with the name of the person we want to search
Table_array	The range of data is formatted as a Table, which is named "Contacts"
Col_index_num	The number of the column we are referencing (column D)
Range_lookup	FALSE was inputted, so that an exact match would be retrieved

=VLOOKUP(F1,Contacts,4,FALSE)



	A	B	C	D	E	F	G	H	I
1	Name	Phone	Cell	Email		Name	Email		
2	Abdallah, Johnetta	919-225-9345	919-715-3791	johnetta_abdallah@aol.com		Kitty, Gail	=VLOOKUP(F2,Contacts,4,FALSE)		
3	Acey, Geoffrey	847-222-1734	847-556-2909	geoffrey@gmail.com					
4	Acuff, Weldon	847-353-2156	847-613-5866	wacuff@gmail.com					
5	Adkin, Barbra	718-201-3751	718-732-9475	badkin@hotmail.com					
6	Agramonte, Fausto	212-313-1783	212-778-3063	fausto_agramonte@yahoo.com					
7	Ahle, Delmy	401-458-2547	401-559-8961	delmy.ahle@hotmail.com					
8	Albares, Cammy	956-537-6195	956-841-7216	calbares@gmail.com					
9	Amigon, Minna	215-874-1229	215-422-8694	minna_amigon@yahoo.com					
10	Amyot, Jutta	337-515-1438	337-991-8070	jamyot@hotmail.com					
11	Andreason, Tasia	201-920-9002	201-969-7063	tasia_andreason@yahoo.com					
12	Angalich, Ahmed	717-528-8996	717-632-5831	ahmed.angalich@angalich.com					
13	Ankeny, Thaddeus	916-920-3571	916-459-2433	tankeny@ankeny.org					
14	Aquas, Judy	269-756-7222	269-431-9464	jaquas@aquas.com					
15	Arceo, Tegan	732-730-2692	732-705-6719	tegan.arceo@arceo.org					
16	Aredondo, Rhea	718-560-9537	718-280-4183	rhea_aredondo@cox.net					
17	Arias, Alyce	209-317-1801	209-242-7022	alyce@arias.org					
18	Asar, Loren	570-648-3035	570-569-2356	loren.asar@aol.com					
19	Auber, Lynelle	973-860-8610	973-605-6492	lynelle_auber@gmail.com					
20	Auffrey, Ressie	305-604-8981	305-287-4743	ressie.auffrey@yahoo.com					

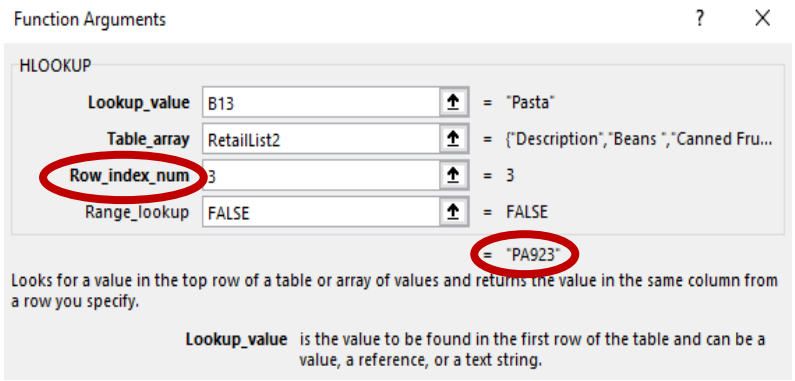
The VLOOKUP in this example uses a Table named “Contacts” as the Table Array argument. To covert a range of data into a Table, select the cells to be included and press CTRL+T; click OK. You can then click on the Design tab and click inside the Name Box in the upper left corner to type in the name.

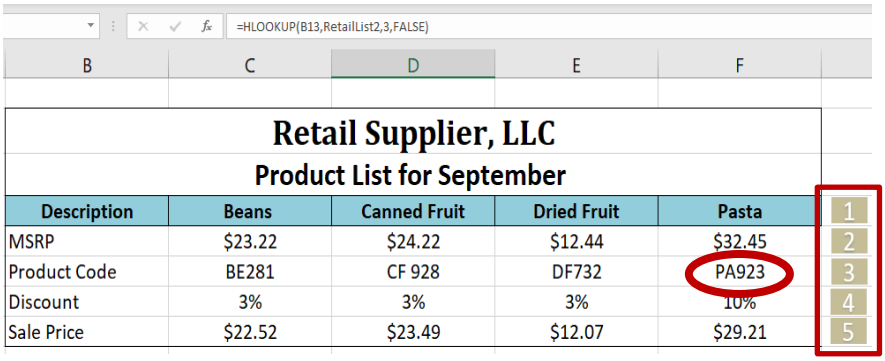


HLOOKUP

The HLOOKUP function uses the same number of function arguments as VLOOKUP but counts the number of rows in the data to find the data instead of counting the number of columns:

=HLOOKUP(B13,RetailList2,3,FALSE)



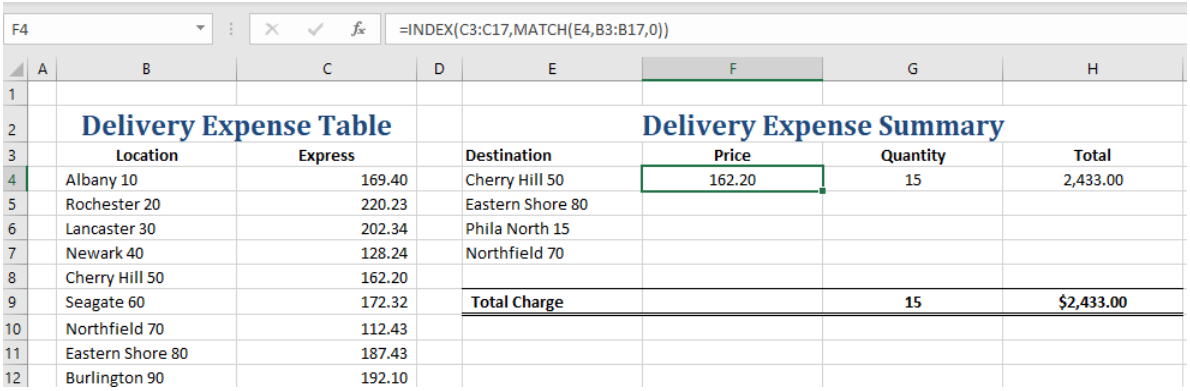


HLOOKUP example

INDEX and MATCH

These two functions working together can be used instead of VLOOKUP for both simple and complex data retrieval. Here's an example of a worksheet that was created to find a delivery expense based on the location inputted into a cell location. The Index is looking for a location (B3:B17) and the Match is looking for the dollar amount (C3:C17):

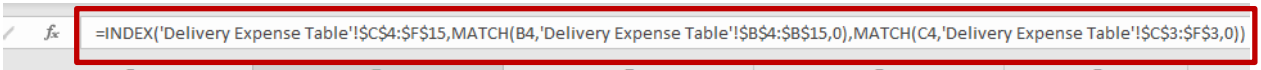
=INDEX(C3:C17,MATCH(E4,B3:B17,0))



	A	B	C	D	E	F	G	H
1								
2		**Delivery Expense Table**				**Delivery Expense Summary**		
3		**Location**	**Express**		**Destination**	**Price**	**Quantity**	**Total**
4		Albany 10	169.40		Cherry Hill 50	162.20	15	2,433.00
5		Rochester 20	220.23		Eastern Shore 80			
6		Lancaster 30	202.34		Phila North 15			
7		Newark 40	128.24		Northfield 70			
8		Cherry Hill 50	162.20					
9		Seagate 60	172.32		**Total Charge**		**15**	**$2,433.00**
10		Northfield 70	112.43					
11		Eastern Shore 80	187.43					
12		Burlington 90	192.10					

Function Argument - INDEX	**Description**
Lookup_value	The range of cells where the delivery expenses are inputted
Input the Match Function	Press the Tab key after inputting the Lookup_value argument
Function Argument - MATCH	
Lookup_value	The Location being looked up (cell E4, Cherry Hill 50)
Lookup_array	The range of data is being looked up (B3:B17)
match_type	0 was inputted, so that an exact match would be retrieved

INDEX and MATCH can also be used to retrieve data from **multiple** columns in a worksheet and use more complex syntax. This worksheet was created to retrieve delivery expenses based on the location and the type of delivery service, so the MATCH function was entered twice. The data is also being retrieved from a separate worksheet in the workbook (Delivery Expense Table):



	C	D	E	F	G
		Delivery Expense Summary			
	Type of Service	**Price**	**Quantity**	**Total**	
	Ground	104.89	25	2,622.17	
	Two Day Air	111.96	5	559.78	
	Express	172.24	3	516.72	
	Ground	88.63	6	531.76	
			39	**$4,230.43**	

Text Functions

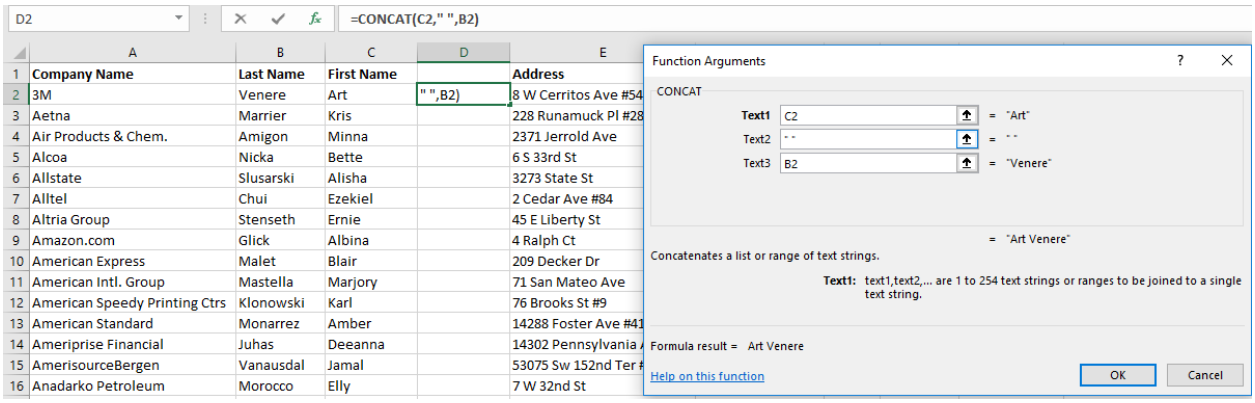
CONCATENATE (or CONCAT for Excel 2016 and later)

This function can be used to combine content in two or more cells in a worksheet into one cell. In the first example, the first name is being combined into one cell with the last name by inputting the function arguments directly into the cells:

	A	B	C
1	Anan	Betty	=CONCATENATE(B1," ",A1)
2	Williams	Annette	=CONCATENATE(B2," ",A2)
3	Bertucci	Betty Anne	=CONCATENATE(B3," ",A3)
4	Biggs	Bill	=CONCATENATE(B4," ",A4)
5	Seagar	Bill	=CONCATENATE(B5," ",A5)
6	Smith	Aarnold	=CONCATENATE(B6," ",A6)
7	White	Jackie	=CONCATENATE(B7," ",A7)
8	Carpenter	Brian	=CONCATENATE(B8," ",A8)

	A	B	C
1	Anan	Betty	Betty Anan
2	Williams	Annette	Annette Williams
3	Bertucci	Betty Anne	Betty Anne Bertucci
4	Biggs	Bill	Bill Biggs
5	Seagar	Bill	Bill Seagar
6	Smith	Aarnold	Aarnold Smith
7	White	Jackie	Jackie White
8	Carpenter	Brian	Brian Carpenter

Another option is to use the Function Arguments dialog box:



	A	B	C	D	E
1	Company Name	Last Name	First Name		Address
2	3M	Venere	Art	" ",B2)	8 W Cerritos Ave #54
3	Aetna	Marrier	Kris		228 Runamuck Pl #28
4	Air Products & Chem.	Amigon	Minna		2371 Jerrold Ave
5	Alcoa	Nicka	Bette		6 S 33rd St
6	Allstate	Slusarski	Alisha		3273 State St
7	Alltel	Chui	Ezekiel		2 Cedar Ave #84
8	Altria Group	Stenseth	Ernie		45 E Liberty St
9	Amazon.com	Glick	Albina		4 Ralph Ct
10	American Express	Malet	Blair		209 Decker Dr
11	American Intl. Group	Mastella	Marjory		71 San Mateo Ave
12	American Speedy Printing Ctrs	Klonowski	Karl		76 Brooks St #9
13	American Standard	Monarrez	Amber		14288 Foster Ave #41
14	Ameriprise Financial	Juhas	Deeanna		14302 Pennsylvania
15	AmerisourceBergen	Vanausdal	Jamal		53075 Sw 152nd Ter
16	Anadarko Petroleum	Morocco	Elly		7 W 32nd St

LEFT, RIGHT and MID

In this worksheet, the purchase order numbers in column B are a combination of three different strings of characters; the invoice number, the item code and a location.

	A	B	C	D	E	F	G	H	I
1	Date	Purchase Order	Product	Unit Price	Units Sold	Total Revenue	Invoice Number	Item Code	Location
2	25-May	819211004PA	Cables	$12	57	$684	8192	11004	PA
3	10-May	819381005NJ	Cables	$12	57	$684	8193	81005	NJ
4	8-Jun	819601006TN	Cables	$12	54	$648	8196	01006	TN
5	2-Jun	819331007NJ	Cables	$12	44	$528	8193	31007	NJ
6	27-May	819211008MD	Cables	$12	40	$480	8192	11008	MD
7	12-May	819551009NJ	Cables	$12	40	$480	8195	51009	NJ
8	9-Jun	819211010CA	Cables	$12	35	$420	8192	11010	CA
9	30-May	819231011PA	Cables	$12	34	$408	8192	31011	PA
10	13-Jun	819211012NJ	Cables	$12	25	$300	8192	11012	NJ
11	20-May	819361013MD	Cables	$12	25	$300	8193	61013	MD
12	5-May	819281014DC	Cables	$12	25	$300	8192	81014	DC

The LEFT function was used to input the first four characters into cell B2, which is =LEFT(B2,4); the MID function was used to input five characters in the middle of the text string, starting with the 5th character, =MID(B2,5,5); the RIGHT function was used to input the last two characters in column B, =RIGHT(B2,2):

	B	C	D	E	F	G	H	I
1	**Purchase Order**	**Product**	**Unit Price**	**Units Sold**	**Total Revenue**	**Invoice Number**	**Item Code**	**Location**
2	819211004PA	Cables	12	57	=PRODUCT(D2,E2)	=LEFT(B2,4)	=MID(B2,5,5)	=RIGHT(B2,2)
3	819381005NJ	Cables	12	57	=PRODUCT(D3,E3)	=LEFT(B3,4)	=MID(B3,5,5)	=RIGHT(B3,2)
4	819601006TN	Cables	12	54	=PRODUCT(D4,E4)	=LEFT(B4,4)	=MID(B4,5,5)	=RIGHT(B4,2)
5	819331007NJ	Cables	12	44	=PRODUCT(D5,E5)	=LEFT(B5,4)	=MID(B5,5,5)	=RIGHT(B5,2)
6	819211008MD	Cables	12	40	=PRODUCT(D6,E6)	=LEFT(B6,4)	=MID(B6,5,5)	=RIGHT(B6,2)
7	819551009NJ	Cables	12	40	=PRODUCT(D7,E7)	=LEFT(B7,4)	=MID(B7,5,5)	=RIGHT(B7,2)
8	819211010CA	Cables	12	35	=PRODUCT(D8,E8)	=LEFT(B8,4)	=MID(B8,5,5)	=RIGHT(B8,2)
9	819231011PA	Cables	12	34	=PRODUCT(D9,E9)	=LEFT(B9,4)	=MID(B9,5,5)	=RIGHT(B9,2)
10	819211012NJ	Cables	12	25	=PRODUCT(D10,E10)	=LEFT(B10,4)	=MID(B10,5,5)	=RIGHT(B10,2)
11	819361013MD	Cables	12	25	=PRODUCT(D11,E11)	=LEFT(B11,4)	=MID(B11,5,5)	=RIGHT(B11,2)
12	819281014DC	Cables	12	25	=PRODUCT(D12,E12)	=LEFT(B12,4)	=MID(B12,5,5)	=RIGHT(B12,2)

Combine Multiple Functions

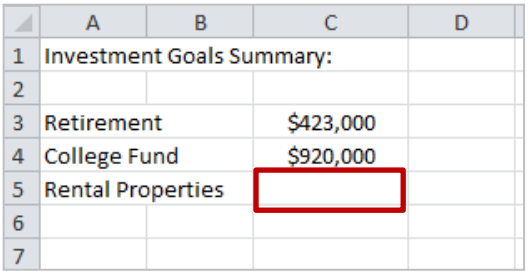
Another way to perform complex calculations in Excel using functions is to input multiple functions in to one cell. This is done by inputting the first function, pressing the Tab key, then entering additional formulas and functions.

The Average Qty per Day, for example, is calculated by using the QUOTIENT to divide the Selling Days This Month (D16) by the Quantity values in cells D8 to D15.

A	B	C	D	E	F	G	H
		Abbey's Flower Shops					
		Sales Results					
		Revenue - Perennials	**Quantity**				
		23	50				
		54	20				
		65	50				
		34	20				
		43	60				
		32	40				
		32	70				
		102	20				
		Selling Days This Month	22				
		Average Qty per Day	15	=QUOTIENT(SUM(D8:D15),D16			
		Average Sales per Day	$650	=QUOTIENT(SUMPRODUCT(C8:C15,D8:D15),D16			
		Total Sales	$14,300	=SUMPRODUCT(C8:C15,D8:D15)			

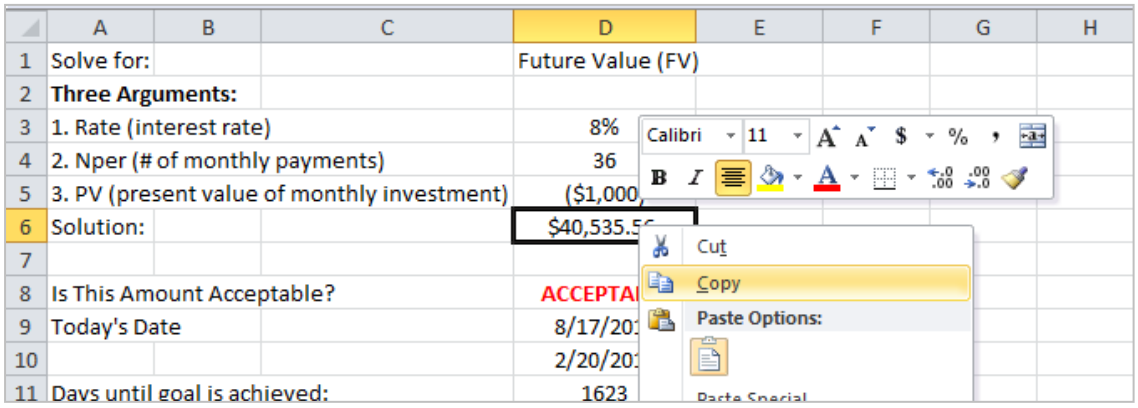
Creating Links Between Worksheets

There may be times when you want the values in one worksheet to be displayed in another worksheet. In this example, the Rental Properties value that will appear in cell C5 will be based on a calculation from a different worksheet:



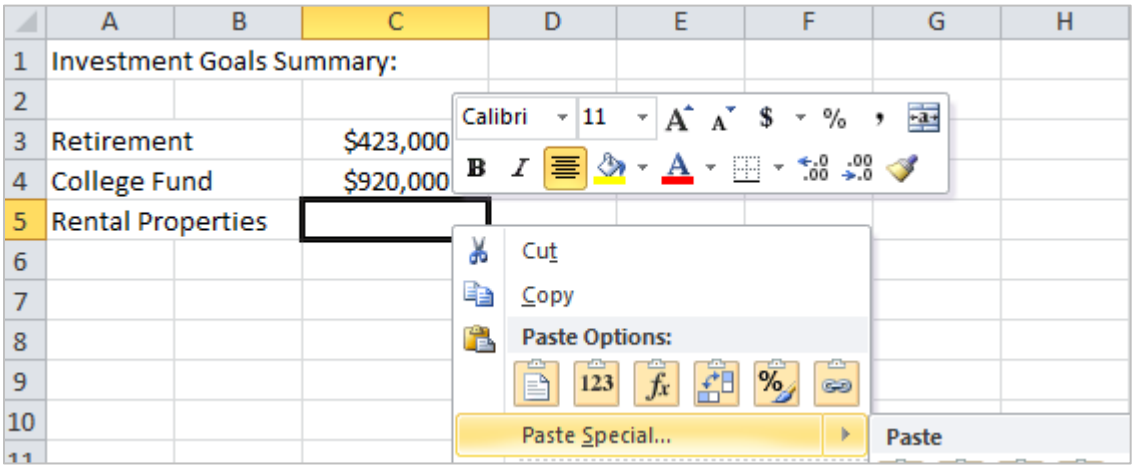
	A	B	C	D
1	Investment Goals Summary:			
2				
3	Retirement		$423,000	
4	College Fund		$920,000	
5	Rental Properties			
6				
7				

This can be done using a Paste Special tool called Paste Link. Select the cell you want copied (cell D6), then right-click to select Copy:

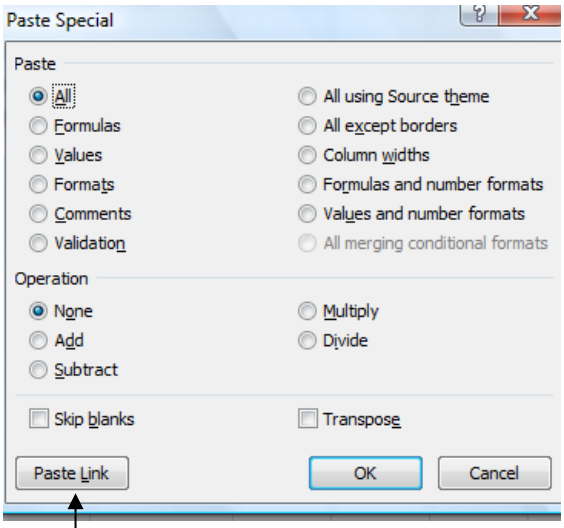


	A	B	C	D	E	F	G	H
1	Solve for:			Future Value (FV)				
2	**Three Arguments:**							
3	1. Rate (interest rate)			8%				
4	2. Nper (# of monthly payments)			36				
5	3. PV (present value of monthly investment)			($1,000)				
6	Solution:			$40,535.5				
7								
8	Is This Amount Acceptable?			ACCEPTA				
9	Today's Date			8/17/20				
10				2/20/20				
11	Days until goal is achieved:			1623				

Click on tab and cell for worksheet where data is to be pasted (cell C5), right-click and choose Paste Special:



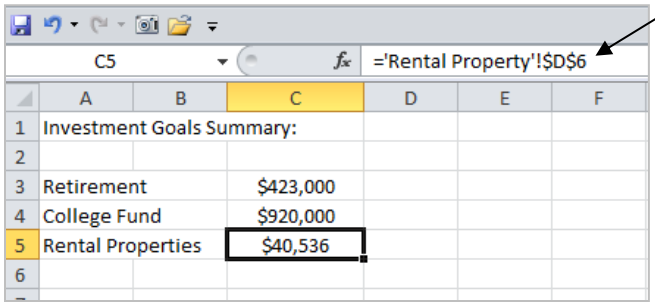
	A	B	C	D	E	F	G	H
1	Investment Goals Summary:							
2								
3	Retirement		$423,000					
4	College Fund		$920,000					
5	Rental Properties							
6								
7								
8								
9								
10								



The Paste Special dialog box will appear. Recall from Chapter 3 that you can paste worksheet formats, operations and formulas in addition to pasting text and numbers.

Click Paste Link:

You will now see the value pasted into the cell. You will also see a **3D Reference** in the formula bar:



A 3D Reference describes:

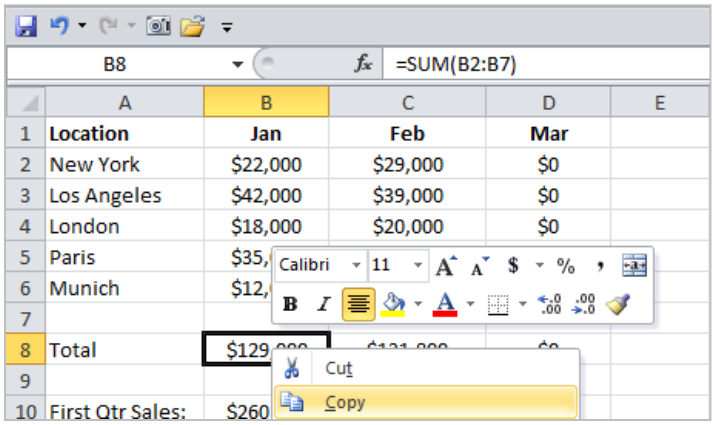
1. The name of the worksheet (Rental Property)
2. The ! separates the name of the worksheet from the cell address
3. The $ within the cell address indicates that this an **absolute reference**

Absolute and Relative Cell References

Relative Cell References

One or more cells with relative references means that any formulas or functions within the cells will change when Autofill or Copy/Paste is used to input data into other cells.

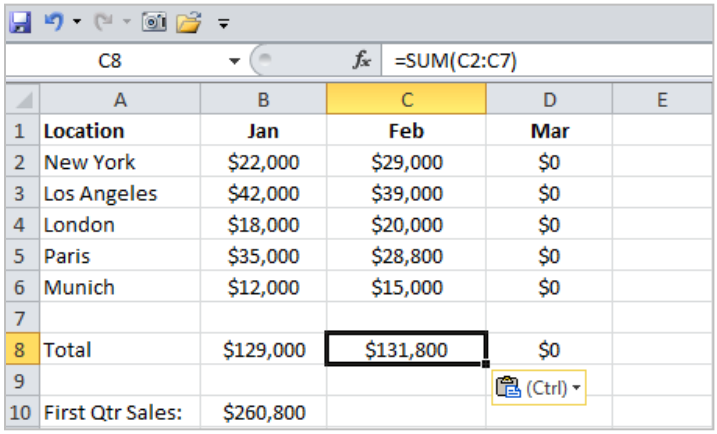
Select and right-click to copy cell B8:



	A	B	C	D	E
1	**Location**	**Jan**	**Feb**	**Mar**	
2	New York	$22,000	$29,000	$0	
3	Los Angeles	$42,000	$39,000	$0	
4	London	$18,000	$20,000	$0	
5	Paris	$35,			
6	Munich	$12,			
7					
8	Total	$129			
9					
10	First Qtr Sales:	$260			

You will see the formula for cell B8 is =SUM(B2:B7)

Select cell C8, right-click and Paste it into cell C8:



	A	B	C	D	E
1	**Location**	**Jan**	**Feb**	**Mar**	
2	New York	$22,000	$29,000	$0	
3	Los Angeles	$42,000	$39,000	$0	
4	London	$18,000	$20,000	$0	
5	Paris	$35,000	$28,800	$0	
6	Munich	$12,000	$15,000	$0	
7					
8	Total	$129,000	$131,800	$0	
9					
10	First Qtr Sales:	$260,800			

Notice that the **function** was pasted into the cell, as opposed to the value of $129,000.

Absolute Cell References

There may be instances where you don't want the values to change as you copy and paste information from one cell to another. For example, a company might create a sales projection worksheet to determine how much profit they will make over the next three months. They know that regardless of how much they sell, the cost of producing the product (COGS) will be 65% of their sales revenue.

We can use the Show Formulas button from the Formulas tab to see how this is calculated and that cell B1 is the absolute reference:

	A	B	C	D
1	**Cost of Goods Sold**	**0.65**		
2	**Month**	**Revenue**	**Cost of Goods Sold**	**Gross Profit**
3	January	20302	=B3*$B$1	=B3-C3
4	February	32312	=B4*$B$1	=B4-C4
5	March	23121	=B5*$B$1	=B5-C5

The values in column C3 through C5 all reference cell B1 (20,302 x 0.65, 32,312 x 0.65, 23,121 x 0.65):

	A	B	C	D
1	**Cost of Goods Sold**	**65%**		
2	**Month**	**Revenue**	**Cost of Goods Sold**	**Gross Profit**
3	January	$ 20,302	$ 13,196	$ 7,106
4	February	$ 32,312	$ 21,003	$ 11,309
5	March	$ 23,121	$ 15,029	$ 8,092

Mixed Cell References

A mixed cell reference can be used when you don't want the cell reference in a column to change ($D4, $D5, etc.) but you want the row to change as you preform calculations using Autofill (25 x 100, $25 x 100) or vice versa. This an example of a business that created a price matrix using mixed cell references:

D	E	F
		Jack's
Units Sold		
100	150	200
=PRODUCT($C4,D$3)	=PRODUCT($C4,E$3)	=PRODUCT($C4,F$3)
=PRODUCT($C5,D$3)	=PRODUCT($C5,E$3)	=PRODUCT($C5,F$3)
=PRODUCT($C6,D$3)	=PRODUCT($C6,E$3)	=PRODUCT($C6,F$3)
=PRODUCT($C7,D$3)	=PRODUCT($C7,E$3)	=PRODUCT($C7,F$3)
=PRODUCT($C8,D$3)	=PRODUCT($C8,E$3)	=PRODUCT($C8,F$3)
=PRODUCT($C9,D$3)	=PRODUCT($C9,E$3)	=PRODUCT($C9,F$3)

B	C	D
		Units Sold
		100
Sale Price	$ 25.00	2,500
	$ 30.00	3,000
	$ 35.00	3,500
	$ 40.00	4,000
	$ 45.00	4,500
	$ 50.00	5,000

Chapter 5: Creating Lists and Tables

In this chapter, we'll look at the steps needed to create and modify lists and Tables. A **list** can be described as a structured collection of information, such and a list of names, address and phone numbers. **Tables** are worksheet formats that make it easier to enter data and perform calculations.

Create a Data List

Click on the first cell in your data list and start inputting the column titles, pressing the Tab key after each entry:

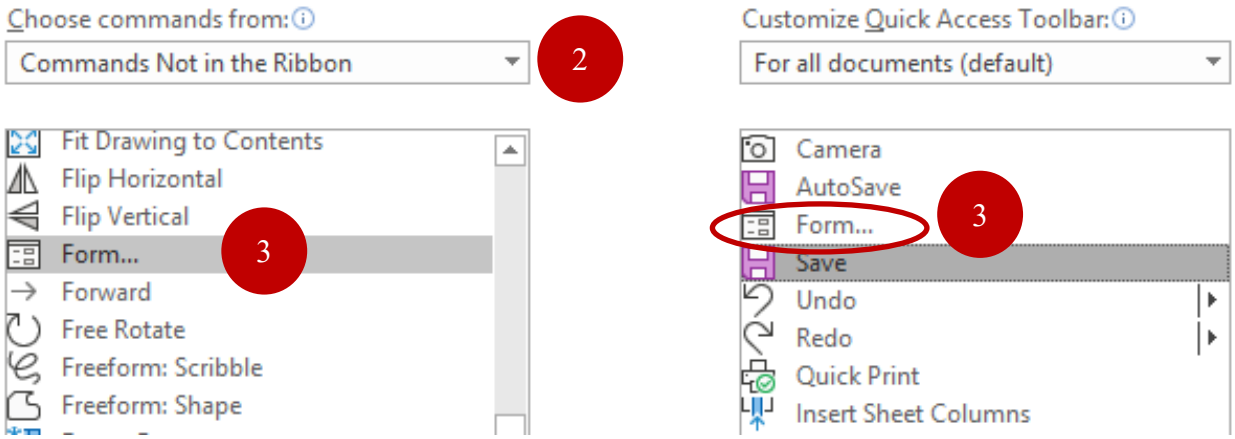
	A	B	C	D	E	F
1	Last Name	First Name	Address	City	State	Zip Code
2						
3						

You can then apply custom and special formats to the cells that will have numbers, such as phone numbers, social security numbers and dates (see page 15).

Enter Data using a Form

Excel has a tool called Form Command that can be added to the Quick Access Toolbar to make it easier to add, delete or edit records in a data list.

1. Click on the File tab. Go to Options and choose Quick Access Toolbar.
2. Under Choose Command from, select Commands Not on the Ribbon.
3. Find the Form command, double-click on it, then click OK:

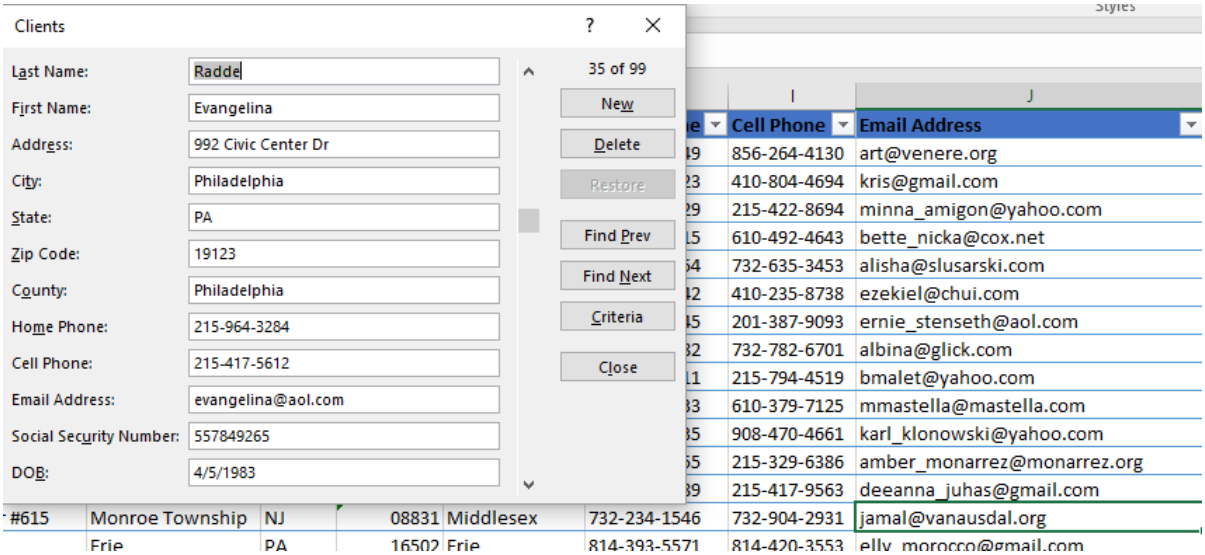


The Form Command works best when the data being accessed is formatted as Table.

4. Click anywhere inside the Data List, then press CTRL+T keys to format the data list as a Table.
5. Click on the Form button on the Quick Access Toolbar to open it.

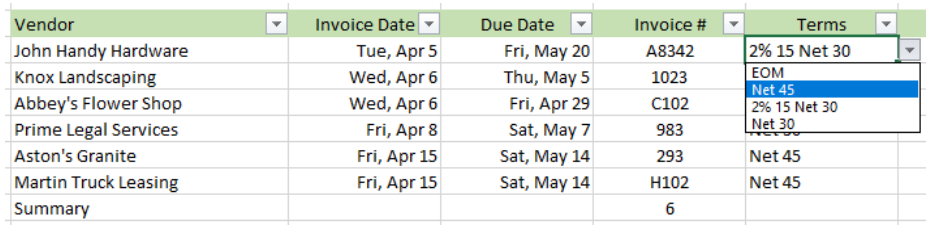
You can see where the first record in the Data List appears. You can click the “New” button whenever you need to add a new record to the list. You would then start inputting the information into the form, pressing the Tab key after each entry (Last Name, First Name, etc.). Press the Enter key after each entry; click the Close button when finished.

To find names within the data list, you would click on the Criteria button and type in the information you’re looking for, such as Last Name. You will then see all the information associated with the last name:

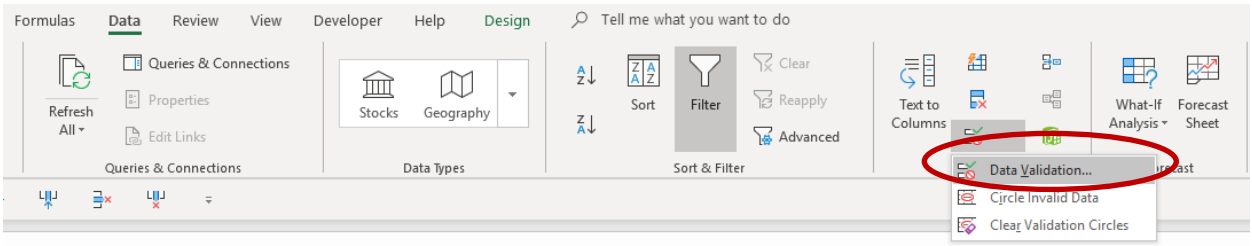


Create a Drop-Down List

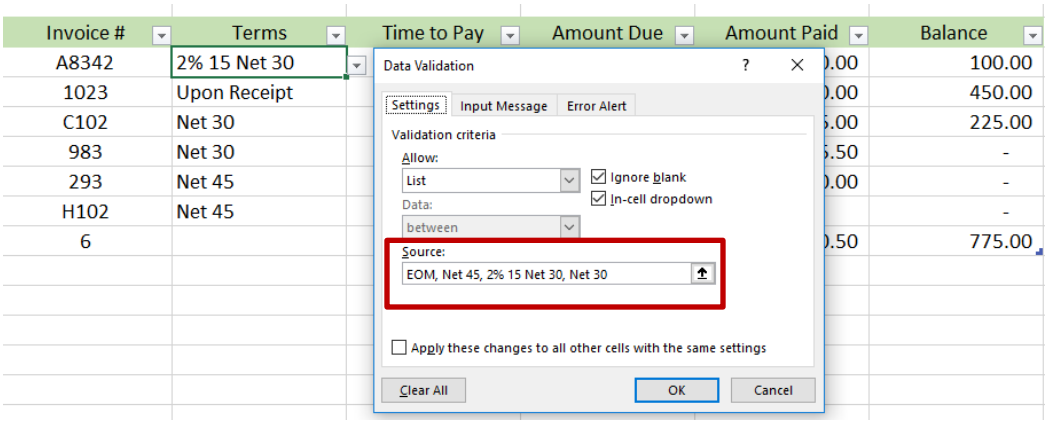
A drop-down list is useful when you have an Excel worksheet being used for data entry. Here’s an example of a company that created a drop-down list of payment term options:



To create a drop-down list, click on the cell where the list options will appear, then click on the Data Tab. Click on the Data Validation down arrow from the Data Tools group and choose Data Validation:



Choose List Under where it says, “Allow”. Type the list into where it says Source, then click OK:

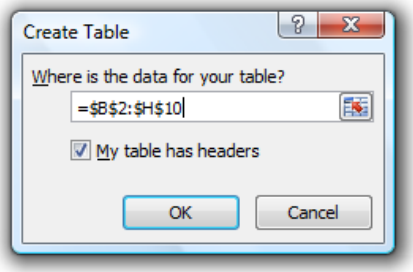


Create a Table

Start by inputting the information to be included in the Table, just like you would for a data list:

	A	B	C	D	E	F	G	H
1		Pre-Calculus Class Performance Summary						
2		Name	Grade Level	Final Exam	Final Grade	Homework	Quiz	Class Part.
3		Zinger, Joseph	11th	83.0%	81.8%	77.0%	86.0%	95.0%
4		Winfrey, Josephine	10th	88.0%	81.4%	71.0%	91.5%	100.0%
5		Williams, Annette	11th	93.0%	95.3%	95.0%	96.0%	100.0%
6		White, Jackie	10th	60.0%	73.2%	94.0%	46.0%	50.0%
7		Spears, JK	10th	59.0%	70.9%	67.3%	77.5%	100.0%
8		Smith, Waldo	10th	84.0%	85.0%	84.0%	84.0%	94.0%
9		Smith, Rodney	11th	65.0%	56.2%	54.0%	52.0%	58.0%
10		Smith, Aarnold	10th	84.0%	79.8%	72.0%	85.0%	100.0%

Click on the Insert tab → Table group → Table button (or CTRL+T). Excel will automatically select the data that will appear in the table; click OK.



The list will be converted into a Table:

	A	B	C	D	E	F	G	H
1		Pre-Calculus Class Performance Summary						
2		Name	Grade Level	Final Exam	Final Grade	Homework	Quiz	Class Part.
3		Zinger, Joseph	11th	83.0%	81.8%	77.0%	86.0%	95.0%
4		Winfrey, Josephine	10th	88.0%	81.4%	71.0%	91.5%	100.0%
5		Williams, Annette	11th	93.0%	95.3%	95.0%	96.0%	100.0%
6		White, Jackie	10th	60.0%	73.2%	94.0%	46.0%	50.0%
7		Spears, JK	10th	59.0%	70.9%	67.3%	77.5%	100.0%
8		Smith, Waldo	10th	84.0%	85.0%	84.0%	84.0%	94.0%
9		Smith, Rodney	11th	65.0%	56.2%	54.0%	52.0%	58.0%
10		Smith, Aarnold	10th	84.0%	79.8%	72.0%	85.0%	100.0%

To change the appearance of a Table, click on it, then click on the Design tab. Choose a style from the Styles group.

Add Table Calculations

For this Class Performance Summary worksheet, we want to see the average score automatically calculated for each column heading in the Table (Final Exam, Final Grade, etc.).

1. Click on one of the cells in the Table. Check off Total Row in the Table Style Options group.
2. Click on cell D11, then Autofill from the Final Exam column to the Class Participation column (cell H11).
3. Change the cell name in B11 from Total to Average:

	A	B	C	D	E	F	G	H
1		Pre-Calculus Class Performance Summary						
2		Name	Grade Level	Final Exam	Final Grade	Homework	Quiz	Class Part.
3		Zinger, Joseph	11th	83.0%	81.8%	77.0%	86.0%	95.0%
4		Winfrey, Josephine	10th	88.0%	81.4%	71.0%	91.5%	100.0%
5		Williams, Annette	11th	93.0%	95.3%	95.0%	96.0%	100.0%
6		White, Jackie	10th	60.0%	73.2%	94.0%	46.0%	50.0%
7		Spears, JK	10th	59.0%	70.9%	67.3%	77.5%	100.0%
8		Smith, Waldo	10th	84.0%	85.0%	84.0%	84.0%	94.0%
9		nith, Rodney	11th	65.0%	56.2%	54.0%	52.0%	58.0%
10		nith, Aarnold	10th	84.0%	79.8%	72.0%	85.0%	100.0%
11		**Average**		**77.0%**	**78.0%**	**76.8%**	**77.3%**	**87.1%**

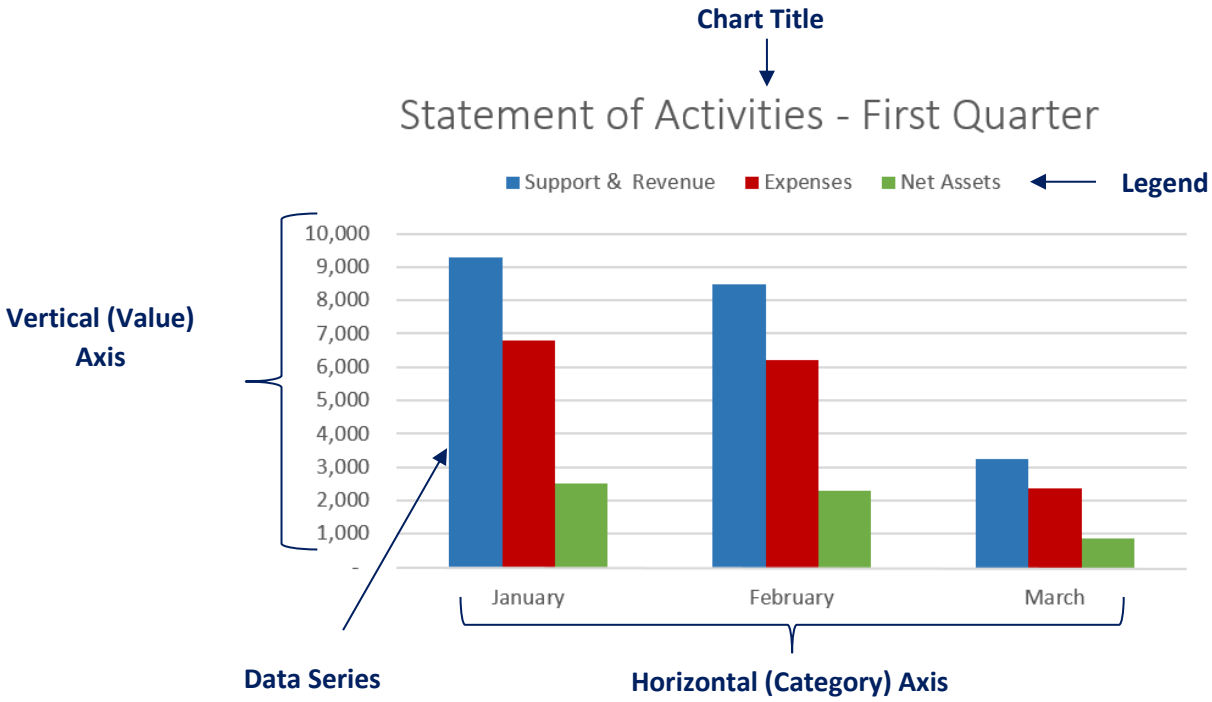
3

You can now see that the class average for final exams is displayed, along with the student's names and averages for the other categories of grade performance.

Chapter 6: Introduction to Charts and Visuals

Elements of a Chart

A chart is a visual representation of Excel worksheet data. It usually includes one or more of these elements:



Column Charts

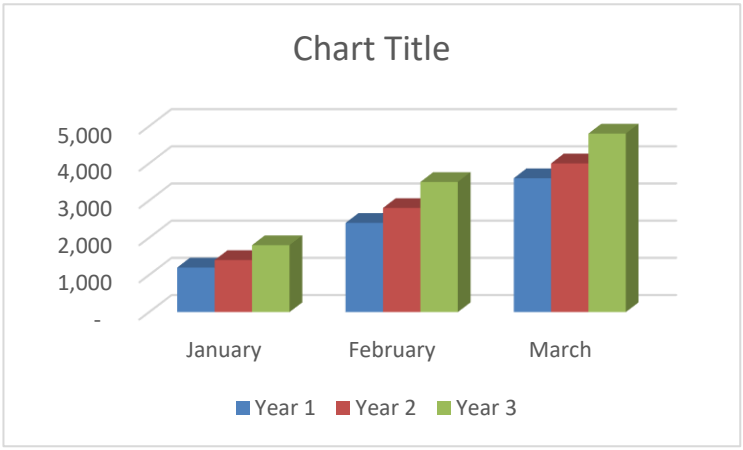
Examples of when to use column charts:

- One value, multiple months or years (i.e., one product, twelve months)
- Multiple values, one month or year (i.e., twelve products, one month)
- Comparing multiple data sets (such as income versus expenses) over multiple time periods

To create a simple column chart, start by inputting all the data to be included in the chart:

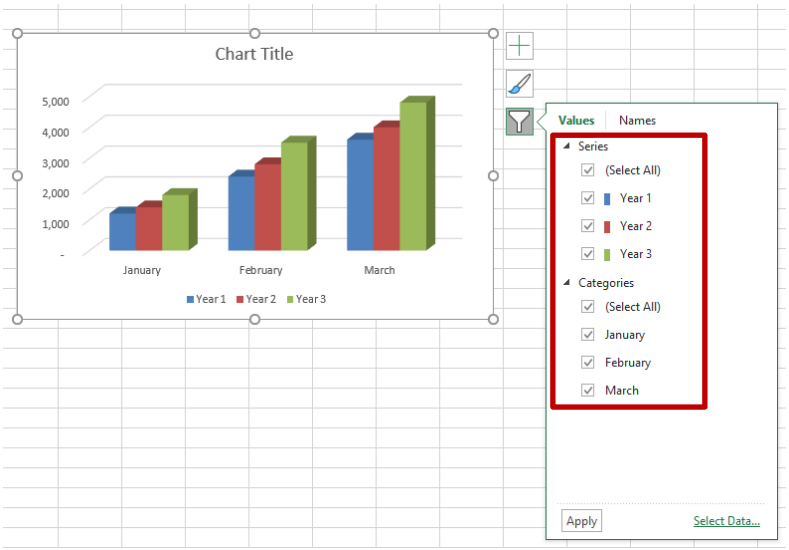
	A	B	C	D
1	**Time**	**January**	**February**	**March**
2	Year 1	1,200	2,400	3,600
3	Year 2	1,400	2,800	4,000
4	Year 3	1,800	3,500	4,800

To create a chart using this data, click on any cell between A1 and D4. Click on the Insert tab and choose the Column button from the Charts group; let's choose 3D clustered column:

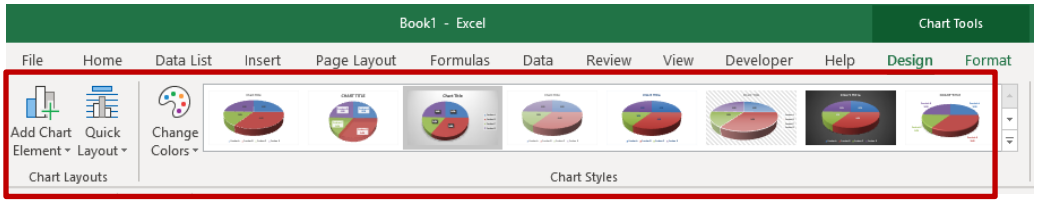


You can also create a chart that includes all the data within the worksheet by clicking on any cell inside the data and pressing press F11 on the keyboard. Excel will create a chart in a new worksheet called Chart 1.

Notice that when you click on the chart, you'll have the ability to change the chart elements, change the chart style or apply a filter.



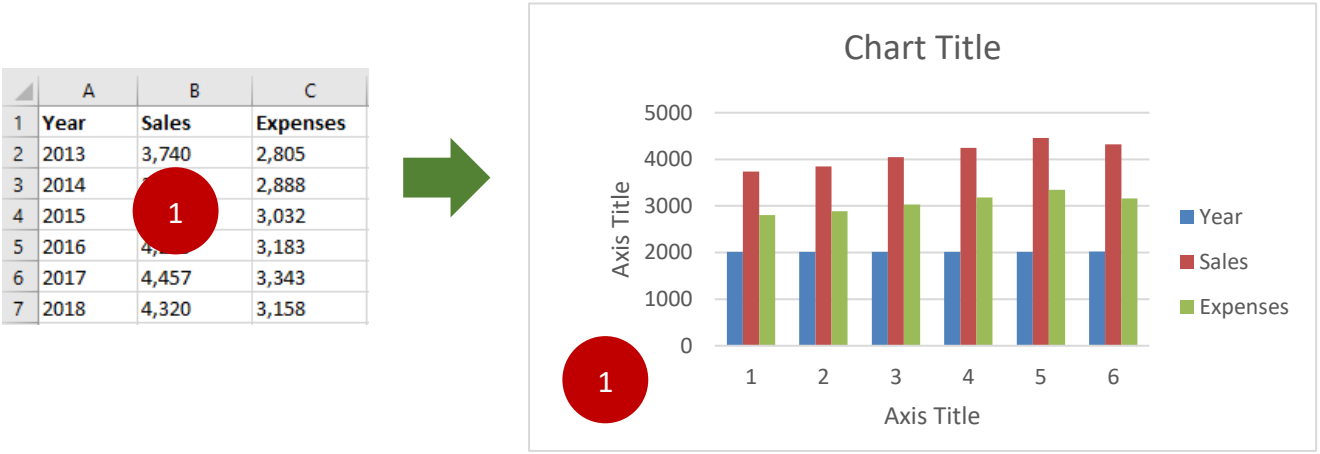
You can also experiment with the different style, layout and chart element tools:



Column Charts with a Numerical Axis

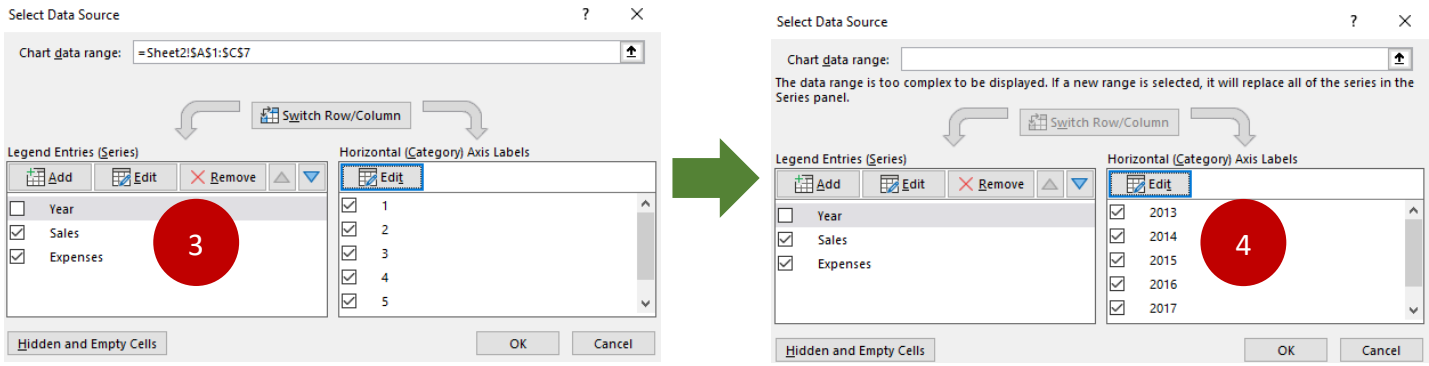
In the previous example, both text and numbers were used to create a chart. However, there may be times when only numbers are being used. Excel will not be able to automatically make a distinction between dollar amounts and the values being represented as years, so you'll need to make some adjustments using options from a dialog box called Select Data Source.

1. Select any cell inside the chart, click Insert tab, click on the Column button from the Charts group. and choose 2D Clustered Column. Choose Layout #9, click OK.

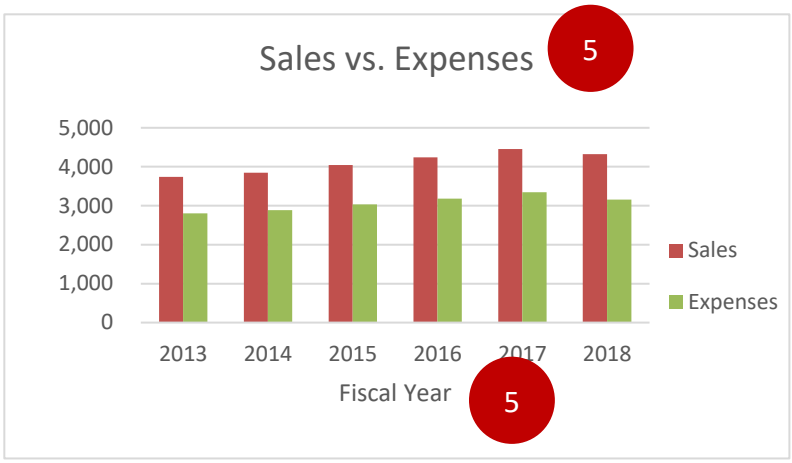


The chart data must now be edited so that the Horizontal Axis shows the right values.

2. Right click on chart, then double-click on Select Data.
3. Click on the Year, click Remove on the Legend section on the left.
4. Click on Edit under Horizontal (Category) Axis Labels, then select the years (2013, 2014, etc.); click OK.

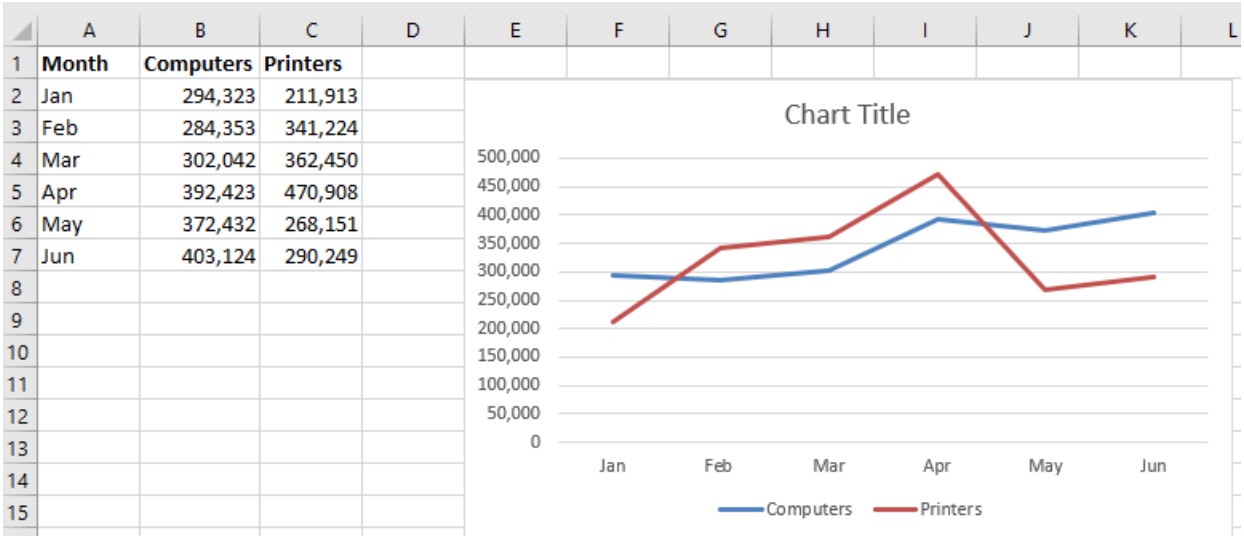


5. Choose names for the title and horizontal axis.



Line Charts

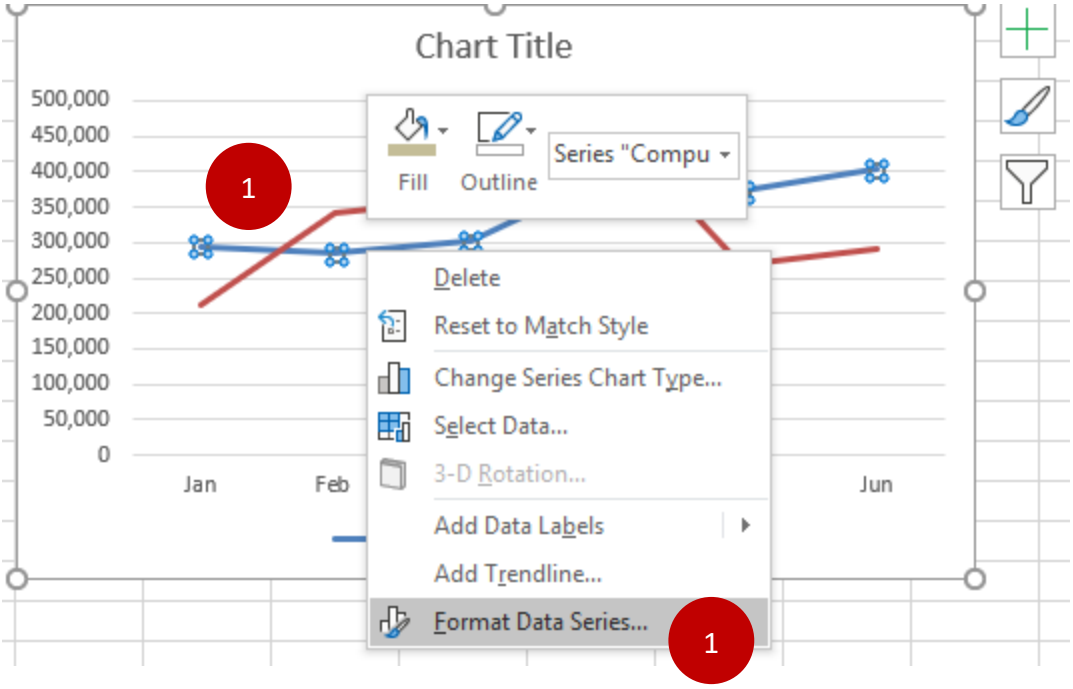
A fictitious company called ABC Electronics sells computer hardware and software. Let's create a line chart that gives them a summary of computer and printer sales from January to June. Create a line chart by clicking on cell B1; click on the Insert tab, then choose the Line button from the Charts group; choose 2D line:



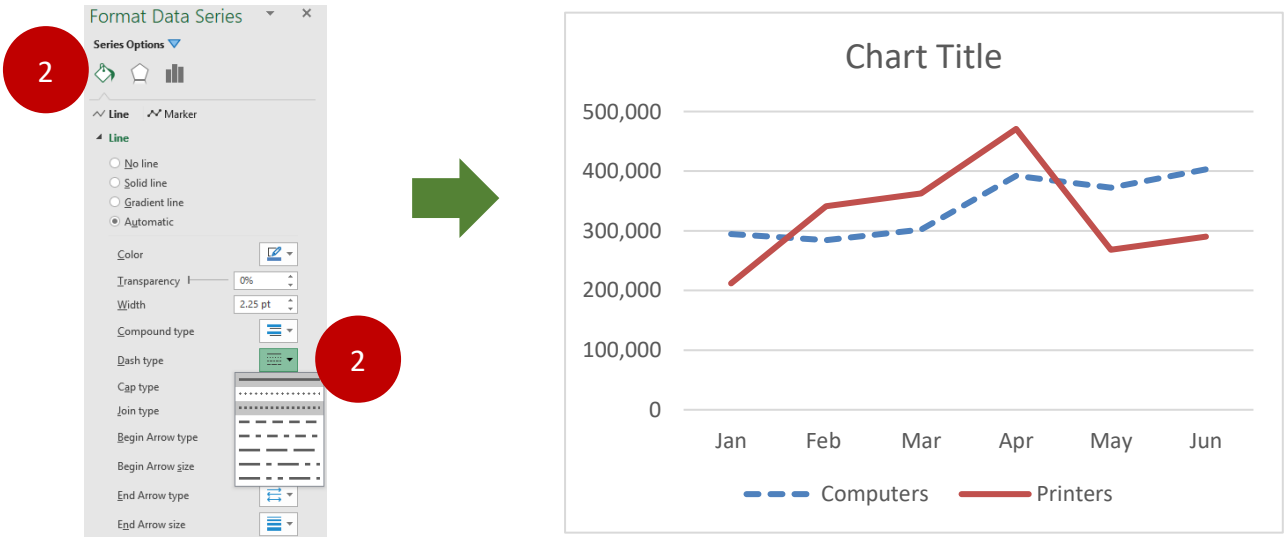
	A	B	C	D	E	F	G	H	I	J	K	L
1	**Month**	**Computers**	**Printers**									
2	Jan	294,323	211,913									
3	Feb	284,353	341,224									
4	Mar	302,042	362,450									
5	Apr	392,423	470,908									
6	May	372,432	268,151									
7	Jun	403,124	290,249									
8												
9												
10												
11												
12												
13												
14												
15												

When comparing two sets of data, you may want to change the appearance of the chart by changing the format of at least one of the data series lines. In this case we want to change the Printers data series to a different format, such as dots or dashes.

1. Click on the Printers data series (blue line), then left-click and choose Format Data Series; a dialog box will appear on the right side of the worksheet.



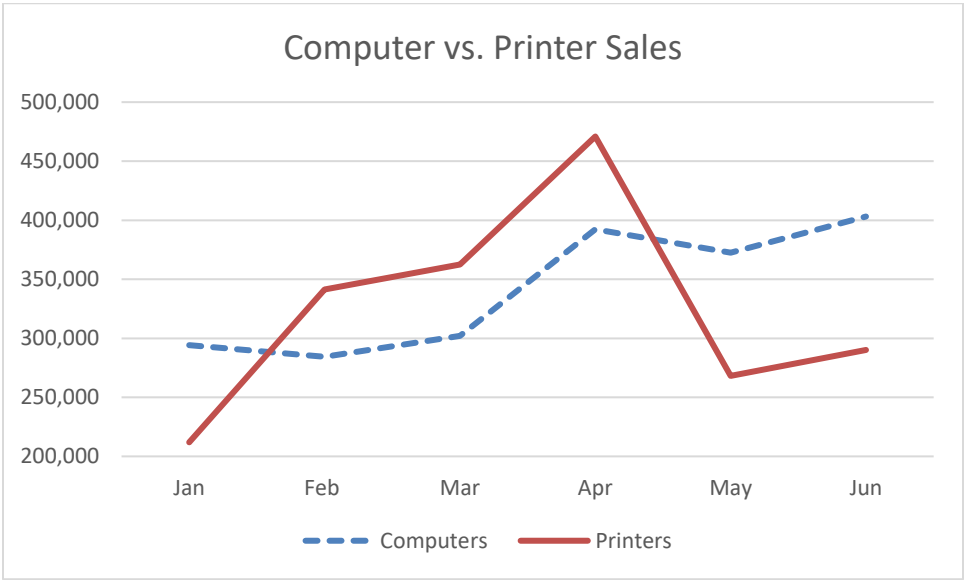
2. Click on the Fill & Line icon, then click on the Dash type drop-down arrow; choose Square Dot Square. Dot from the Dash type drop-down menu; click on the Close button. You now have two lines in the graph that are distinguished by color and line style.



You can also change the format of the chart by changing the values in the vertical axis, which currently range from 0 to 500,000. Since the lowest value in the chart is over 200,000, we can make the chart area smaller by making the lowest value 200,000.

3. Right-click on the vertical axis and choose Format Axis; under Axis Options, change the Minimum to 200000.0.

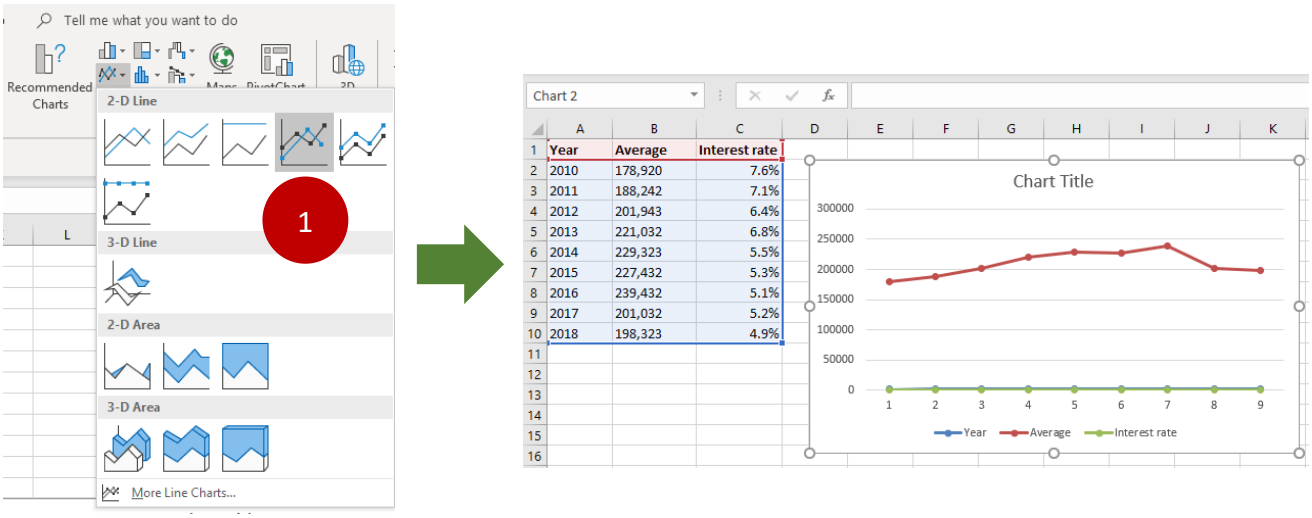
The chart area is now more compact and easier to read:



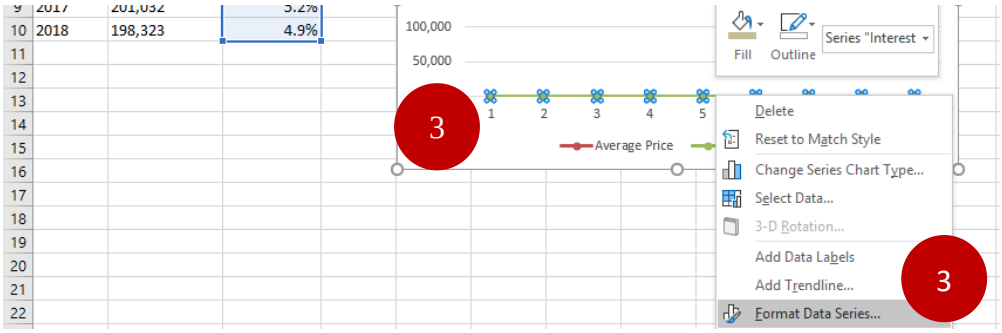
Line Charts with a Secondary Axis

A business is looking to buy commercial real estate in a new location. They want to evaluate the market conditions over the past eight years by comparing the average cost for a small building to the interest rates banks were charging. Since we want to display two sets of data in a format that's easy to understand, we will need to format the line chart with a secondary axis.

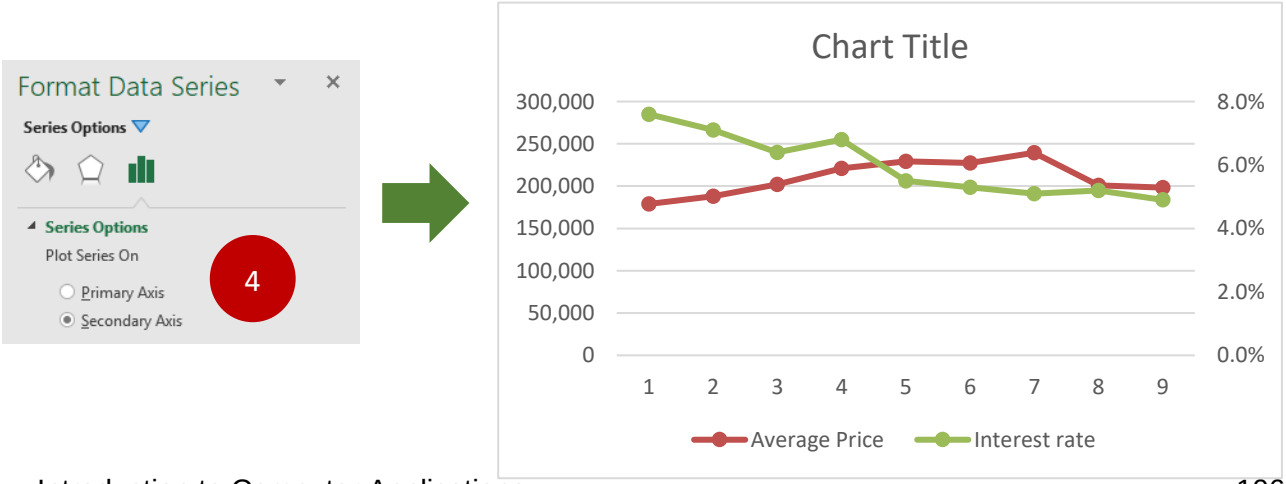
1. Click on the Insert tab and choose, Line Chart from the Charts group; choose Line with Markers.



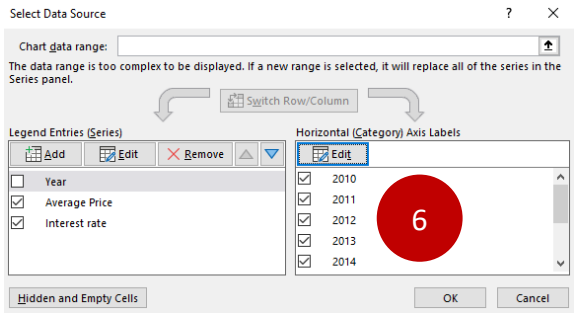
2. Click on the Chart, then click on the Chart Filter; uncheck “Year”, then click on “Apply”.
3. Right-click on the Interest Rate Data Series, then click on Format Data Series.

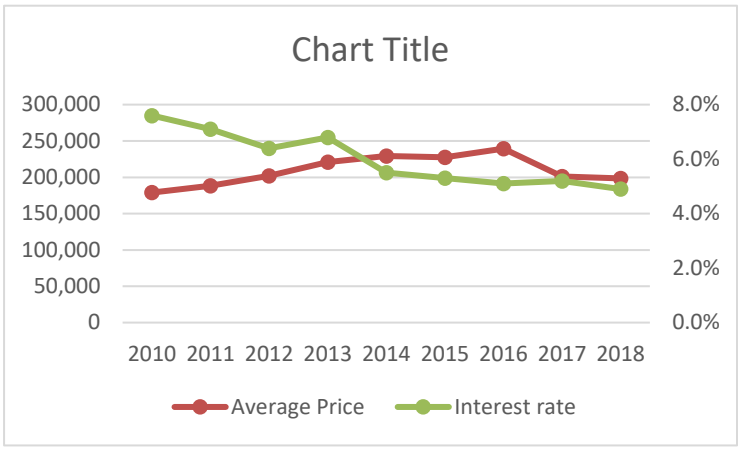


4. Click on Secondary Axis. The chart now displays the percentage values on the right side of the chart.



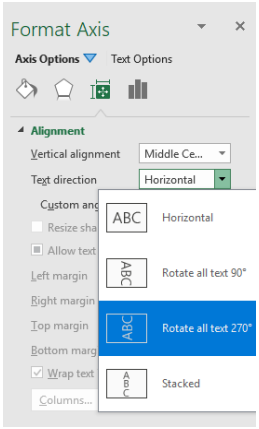
5. Right-click on the Horizontal Axis; choose Select Data.
6. Select cells A2:A10; click OK. The Chart now shows the time periods on the Horizontal axis.



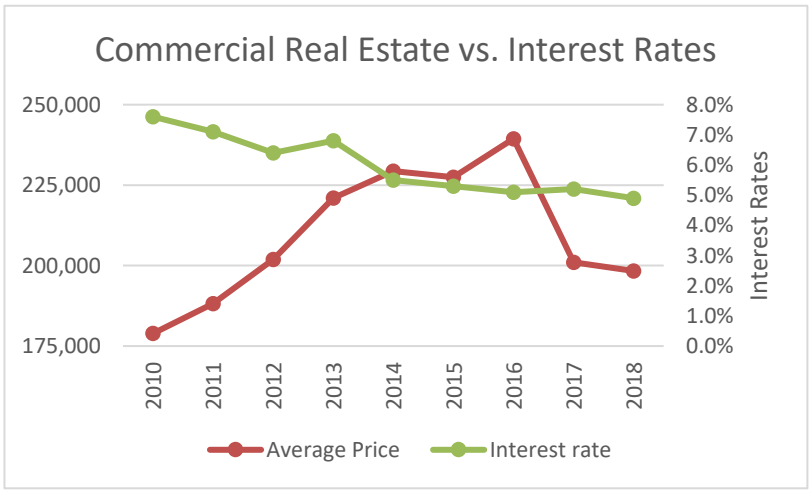


8. You can make the time periods easier to read by right-clicking on the Horizontal Axis a choosing Format Axis.

9. Click on the Size and Properties option under Axis Options. Under Text Direction, choose Rotate all text 270 degrees.



The chart will now display the time periods vertically. You can also change the way the dollar amounts are formatted on the Vertical Axis by changing the minimum value displayed to 175,000, the maximum to 250,000 and the Major unit to 25,000:

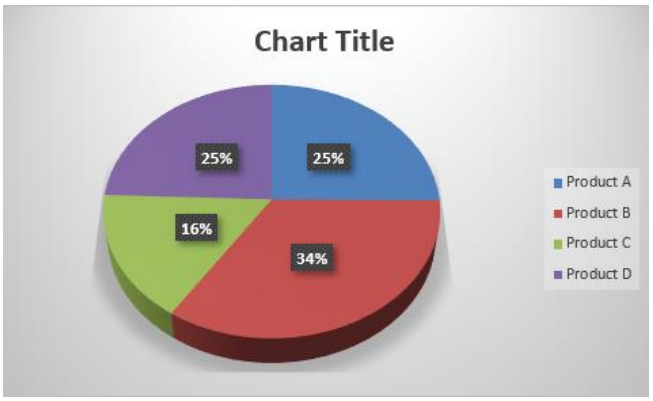


Pie Charts

Pie charts are created when you need to show the percentage breakdown of whole numbers, such as total sales by product or months in the year.

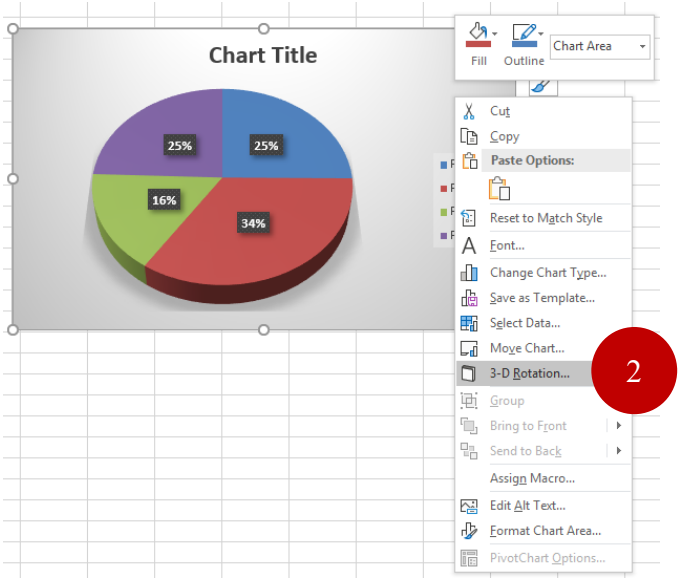
1. Create a worksheet with the following information, then create a 3D Pie Chart. Choose a style and layout option.

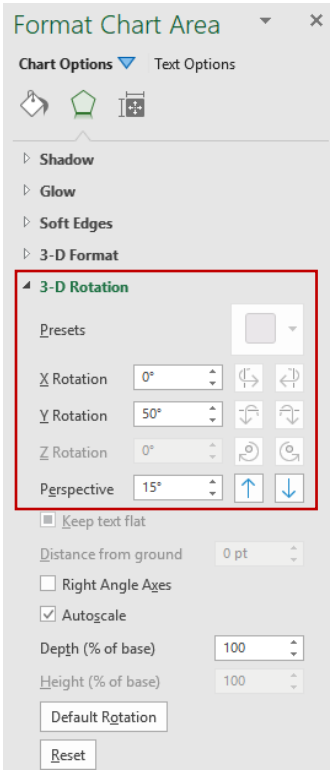
	A	B
1	Product A	281,234
2	Product B	382,422
3	Product C	182,432
4	Product D	273,432



Editing a Pie Chart

2. Right-click on chart, select 3D Rotation; the Format Cart Area dialog box will appear.





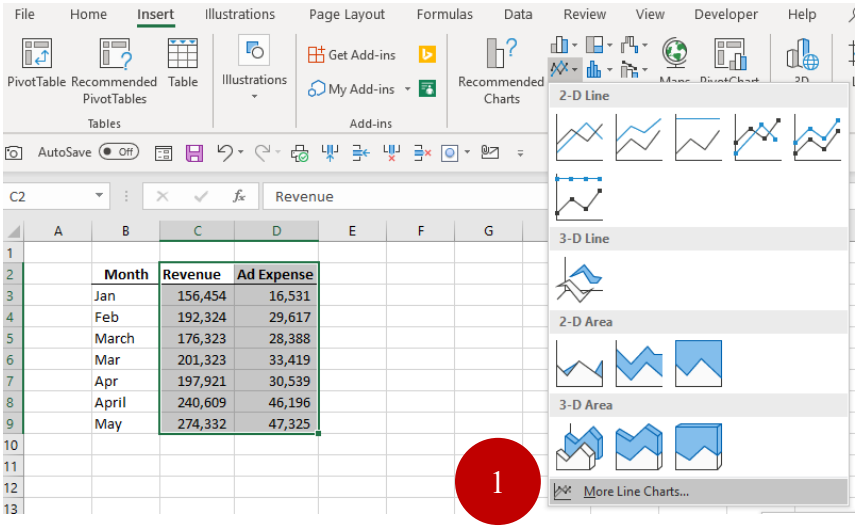
3D Rotation Options:

X Rotation: Move the chart around, clockwise
Y Rotation: Move the chart up and down
Perspective: Increase/decrease the chart depth

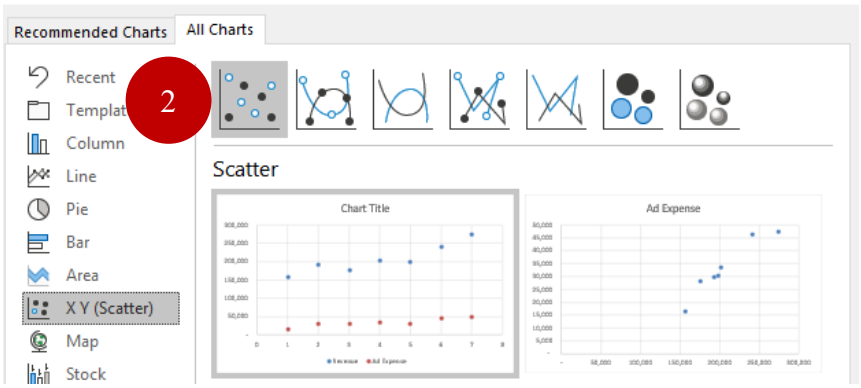
XY Scatter Charts

Another way to evaluate numbers in a spreadsheet is to create a Scatter chart. This company spends a lot of money on advertising and they want to see if there's a relationship between income and monthly ad expenses.

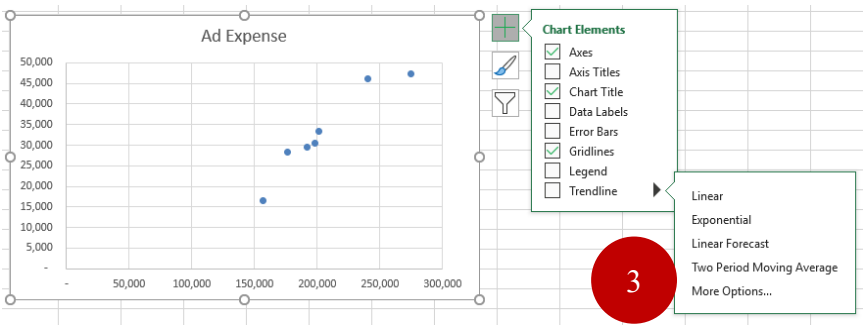
1. Select cells C3 to D9. Click on Insert, Insert Line or Area Chart, More Line Charts.



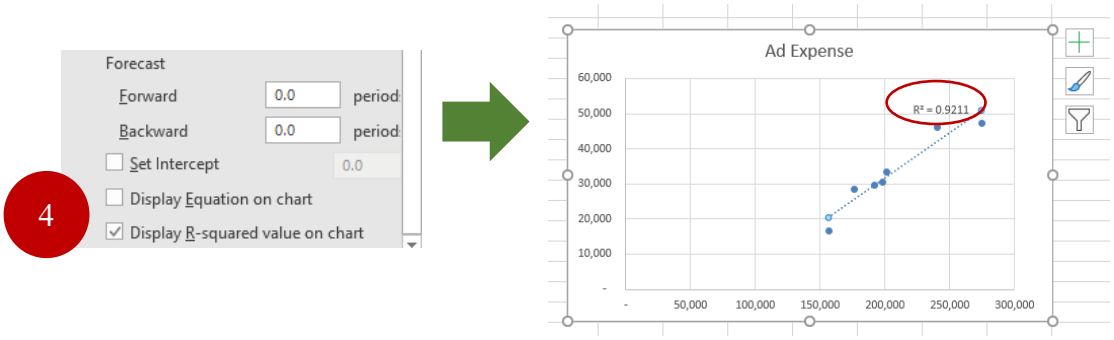
2. Click on XY Scatter, choose Scatter, then click OK.



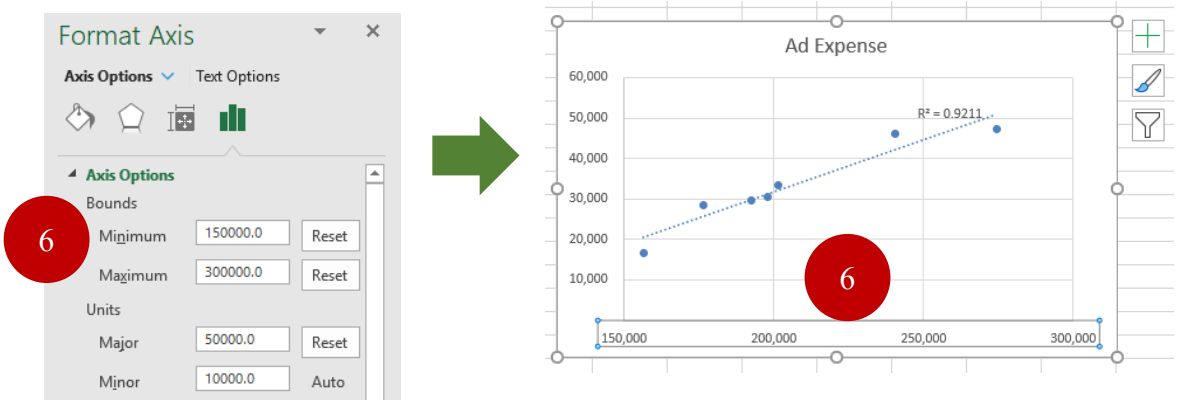
3. Click on the Chart, then click on Chart Elements (the plus sign), then click on the arrow next to Trend Line. Click on More Options.



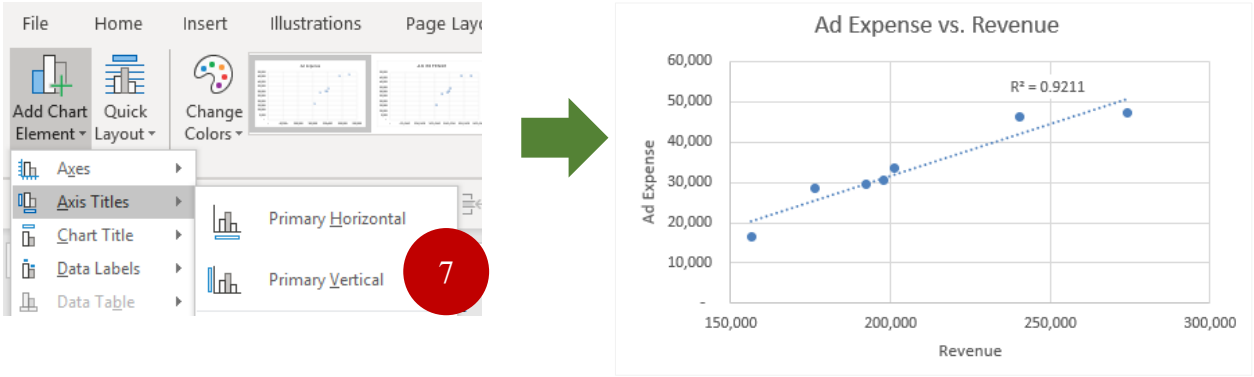
4. Under Trendline Options, check off Display R squared value. Close the dialog box. An R-square value of .90 or higher means that the two sets of data are highly correlated. In other words, higher amounts of money spent on advertising in a given time period generally means that revenue numbers will also be higher.



5. Right-click on the Horizontal axis; choose Format Axis.
6. Under Axis Options, choose 150,000 for the Minimum, 300,000 for the Maximum and 5,000 under Units, Major.



7. Click on the chart, then click on the Design tab. Go to Axis Titles and click on Primary Horizontal and Primary Vertical. Change the chart title and axis names and formatting.

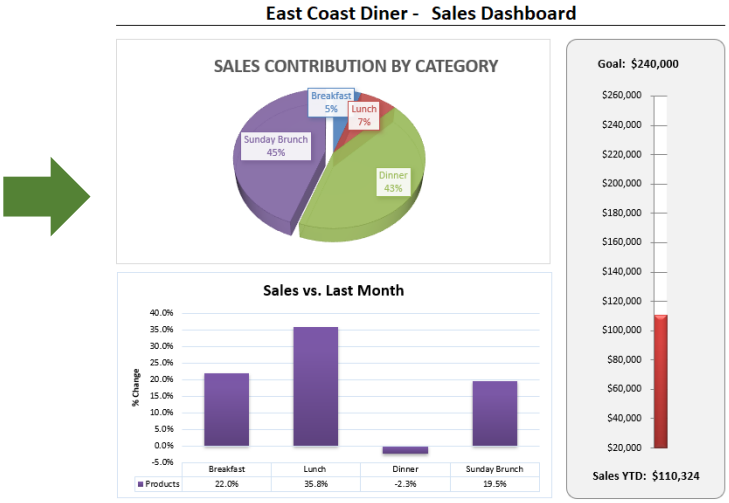


Create a Dashboard using Multiple Charts

A Dashboard can be described as a visual representation of multiple charts, graphs or tables. They can be used to help organizations keep track of business performance.

To create a dashboard, first create the charts in Excel. Then click on each chart and click on Chart Tools. From the Design tab, click on the Move Chart button from the Location group:

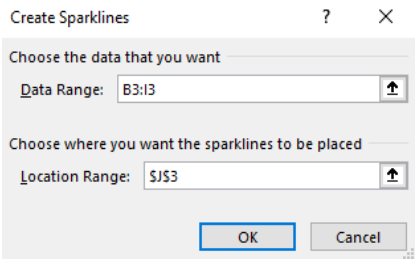
	B	C	D	E	F	G	H
	Annual Sales Goal				**Sales vs. Last Month**		
	Goal:	$ 240,000		Product	This Month	Last Month	% Change
	Sales YTD:	$ 110,324		Breakfast	1,123	921	22.0%
	% Achieved	46.0%		Lunch	1,498	1,103	35.8%
				Dinner	8,924	9,131	-2.3%
	Sales Contribution by Category			Sunday Brunch	9,231	7,726	19.5%
	Breakfast	1,123		**Total**	**$ 20,776**	**$ 18,881**	10.0%
	Lunch	1,498					
	Dinner	8,924					
	Sunday Brunch	9,231					
	Total	$ 20,776					



Sparkline Charts

Excel 2010 introduced Sparklines, which are small charts that take up one cell in the worksheet. They can be either **Line, Column or Win/Loss** and useful for summarizing values over a period of time, such as a month, quarter or a year.

To insert a Sparkline chart, click on a cell (J3), then click on the Insert tab and choose a chart style from the Sparkline group (i.e., Line). The Create Sparklines dialog box will appear. Select the Data Range (B3:I3) and where the Sparkline chart will be inputted (cell J3); click OK. You can then Autofill the rest of the column (cells J4 to J10):



	A	B	C	D	E	F	G	H	I	J
1		Revenue by Store Location								
2		Jan	Feb	March	Mar	Apr	April	May	Jun	Trend
3	**Balt 40**	12,434	11,021	37,242	13,950	26,354	29,431	32,508	35,585	
4	**Balt 50**	11,564	10,250	34,635	12,974	24,509	27,371	30,232	33,094	
5	**Del. 70**	43,234	9,020	30,479	11,417	21,568	24,086	26,604	29,123	
6	**Del. 80**	61,825	12,898	43,585	16,326	30,842	34,443	65,232	41,645	
7	**NY 90**	47,605	9,931	33,560	55,434	23,749	26,521	50,229	32,067	
8	**Phila 10**	62,839	13,110	44,300	16,594	31,348	35,008	66,302	42,328	
9	**Phila 20**	82,947	17,305	58,475	21,904	41,380	46,211	87,518	55,873	
10	**Phila 30**	45,343	23,543	53,797	20,151	38,069	42,514	40,342	23,423	

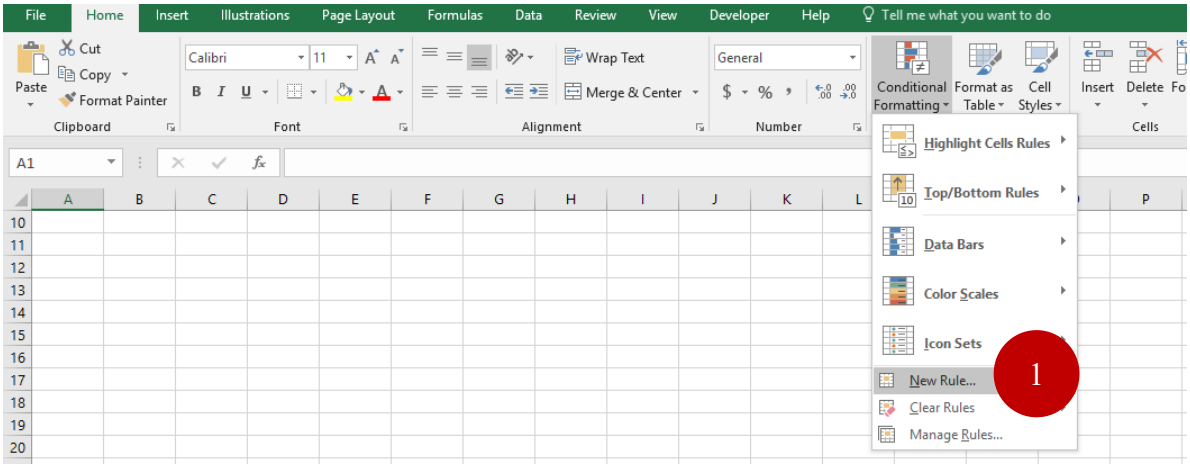
Here are examples of Win/Loss and Column Sparklines:

	A	B	C	D	E	F	G	H	I	J
1	YTD Operating Profit/Loss by Store Location									
2		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Win/Loss
3	Balt 40	3,724	(1,643)	2,943	4,254	(7,243)	10,243	1,102	(192)	
4	Balt 50	1,134	2,174	1,732	2,843	(712)	(1,243)	2,433	3,321	
5	Del. 70	2,732	2,613	3,943	(1,623)	2,432	(243)	26,604	29,123	
6	Del. 80	(1,234)	(473)	(432)	(1,432)	1,743	2,743	1,723	(1,143)	
7	NY 90	1,526	(243)	(824)	2,732	3,342	4,932	3,243	1,233	
8	Phila 10	1,523	3,724	902	284	(243)	(282)	3,812	42,328	
9	Phila 20	2,743	2,632	4,323	(723)	(643)	2,843	2,643	1,743	
10	Phila 30	3,723	3,248	1,523	4,732	4,834	(173)	1,643	2,224	
11										
12	YTD Operating Profit/Loss by Store Location									
13		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Column
14	Balt 40	3,724	(1,643)	2,943	4,254	(7,243)	10,243	1,102	(192)	
15	Balt 50	1,134	2,174	1,732	2,843	(712)	(1,243)	2,433	3,321	
16	Del. 70	2,732	2,613	3,943	(1,623)	2,432	(243)	26,604	29,123	
17	Del. 80	(1,234)	(473)	(432)	(1,432)	1,743	2,743	1,723	(1,143)	
18	NY 90	1,526	(243)	(824)	2,732	3,342	4,932	3,243	1,233	
19	Phila 10	1,523	3,724	902	284	(243)	(282)	3,812	42,328	
20	Phila 20	2,743	2,632	4,323	(723)	(643)	2,843	2,643	1,743	
21	Phila 30	3,723	3,248	1,523	4,732	4,834	(173)	1,643	2,224	

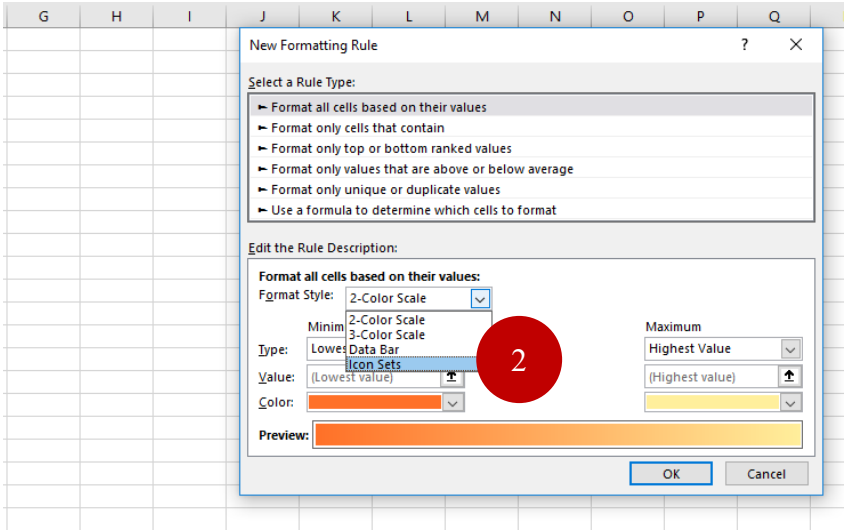
Conditional Formatting

You can use Conditional Formatting to apply formats to cells that meet one or more conditions. For example, a company may want to compare the current month's sales results to the prior month. They can use Conditional Formatting to indicate whether the value within each product category is less than or greater than 5%.

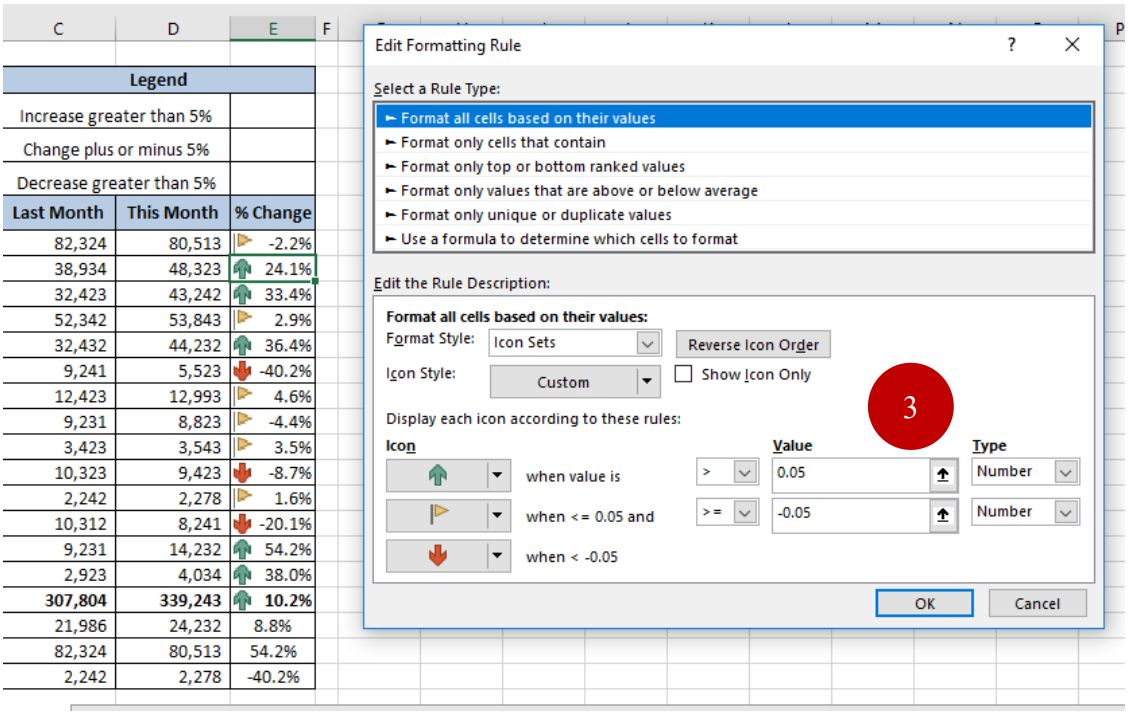
1. To apply Conditional Formatting, click on the Home tab, then click on the Conditional Formatting down arrow. Click on New Rule.



2. Under New Rule, click on the down arrow under Format Style and choose Icon Sets:



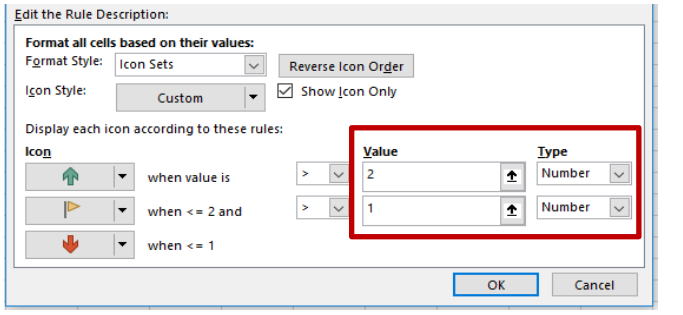
3. Let's choose the green flag icon to display whenever a value of greater than or equal to 5% is inputted; you would type .05 for the value and choose Number from the drop-down menu. Do the same for the yellow flag option by inputting -.05; click OK.



Creating a Legend

Excel does not have specific command for creating a legend, but it is sometimes helpful to create one when you apply conditional formatting. This is especially helpful if the workbook is going to be shared with someone who will want to know what the icons represent.

1. Select the cells where the icons for the legend will appear (A1 to A3).
2. Go to the Home tab and click on the Conditional Formatting; choose New Rule.
3. Enter the values and options depicted in the illustration; click OK.

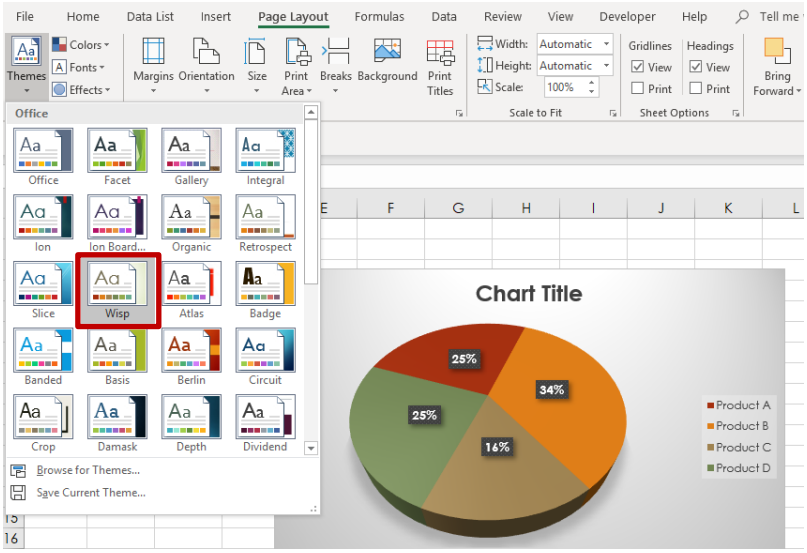


East Coast Company, Inc.	Legend	
	Increase greater than 5%	
	Change plus or minus 5%	
	Decrease greater than 5%	

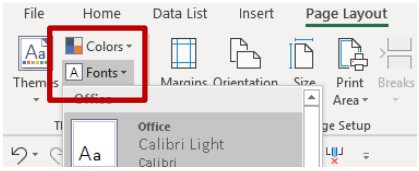
Department	Last Month	This Month	% Change
Athletic Shoes	82,324	80,513	-2.2%
Auto & Tires	38,934	48,323	24.1%
Bedding	32,423	43,242	33.4%
Electronics	52,342	53,843	2.9%
Baby Supplies	32,432	44,232	36.4%
Hardware	9,241	5,523	-40.2%
Health & Beauty	12,423	12,993	4.6%
Home Improvement	9,231	8,823	-4.4%
Home Office	3,423	3,543	3.5%
Jewelry	10,323	9,423	-8.7%
Photo Center	2,242	2,278	1.6%
Small Appliances	10,312	8,241	-20.1%
Sports & Fitness	9,231	14,232	54.2%
Toys	2,923	4,034	38.0%
Total:	**307,804**	**339,243**	**10.2%**
Average Values	21,986	24,232	8.8%
Highest Values	82,324	80,513	54.2%
Lowest Values	2,242	2,278	-40.2%

Working with Themes and Styles

You can change the colors, fonts and styles in a worksheet by clicking on the Layout tab and then choosing a Theme. Here's an example of what the Wisp theme would look like when applied to a chart:



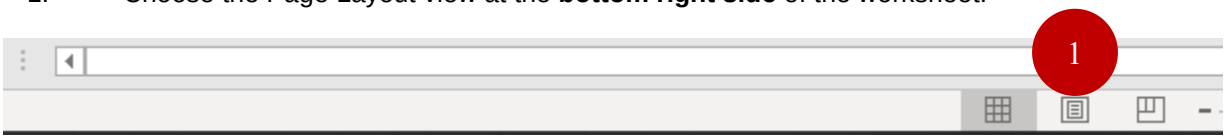
You could also choose to only change the colors or fonts of a workbook by using options from a drop-down list after clicking on the Page Layout tab:



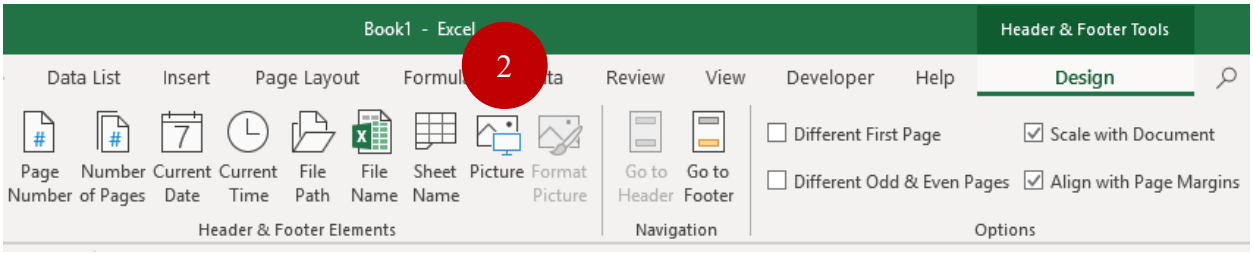
	A	B	C	D	E	F	G	H
1		Pre-Calculus Class Performance Summary						
2		Name	Grade Level	Homework	Quiz	Class Part.	Final Exam	Final Grade
3		Anan, Betty	10th	67.5%	82.5%	90.8%	88.0%	76.9%
4		Williams, Annette	11th	95.0%	96.0%	100.0%	93.0%	95.3%
5		Bertucci, Betty Anne	10th	77.0%	75.0%	96.0%	70.0%	77.1%
6		Biggs, Bill	11th	68.8%	90.0%	98.1%	82.0%	78.6%
7		Seagar, Bill	10th	90.0%	86.0%	99.0%	88.0%	89.7%
8		Smith, Aarnold	10th	72.0%	85.0%	100.0%	84.0%	79.8%
9		White, Jackie	10th	94.0%	46.0%	50.0%	60.0%	73.2%
10		Carpenter, Brian	11th	75.0%	28.0%	40.0%	51.0%	57.3%

Add a Picture Background to a Worksheet

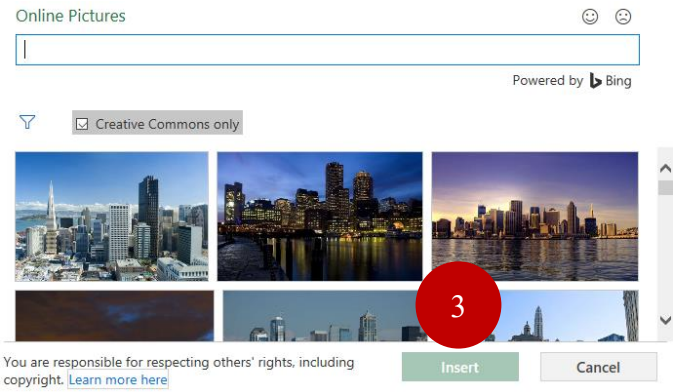
1. Choose the Page Layout view at the **bottom right side** of the worksheet.



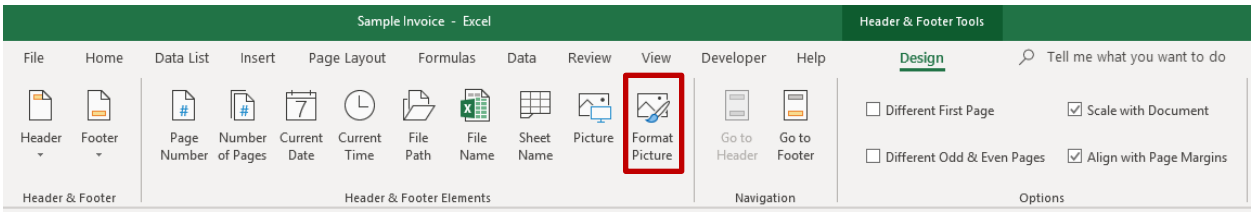
2. Click inside the box next to where is says “Header”; click on Design, then click on Picture



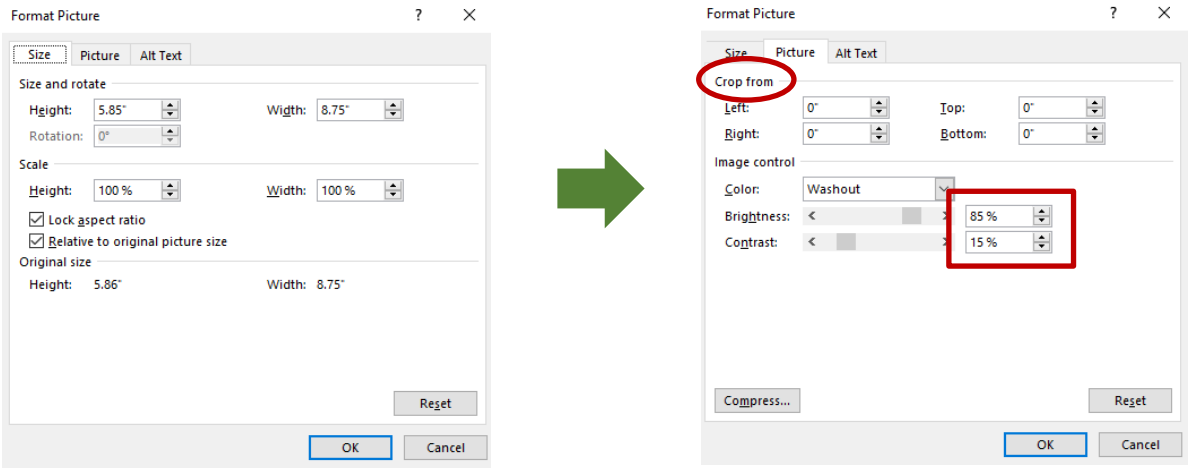
3. From here you can choose a picture from a hard drive, flash drive or online. Choose a picture and click Insert.



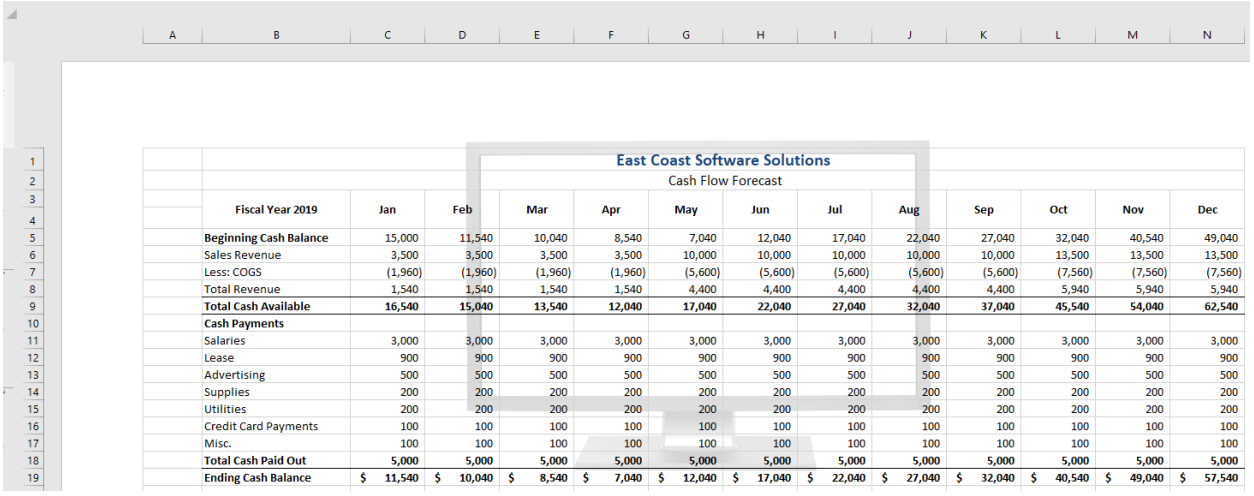
Click on the Design tab, then click on the Format Picture button from the Header and Footer Elements group.



When the dialog box appears, you will be able to adjust the size of the picture background and how it will appear. On the Size tab you make some adjustments or keep the default settings. On the Picture tab, you can use the Image control to create the background image. Choose Washout under the Color drop-down. For this picture, the Brightness will be set at a high percentage (85%) and the Contrast at a low percentage (15%). The “Crop from” options allow you to adjust the placement of the picture background.



Click OK when finished. You will only be able to see the picture image in the Page Layout view and in Print Preview, which in this example is a picture of a computer monitor:

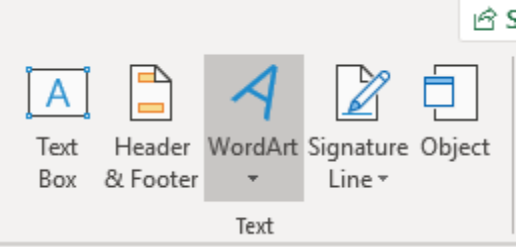


East Coast Software Solutions
Cash Flow Forecast

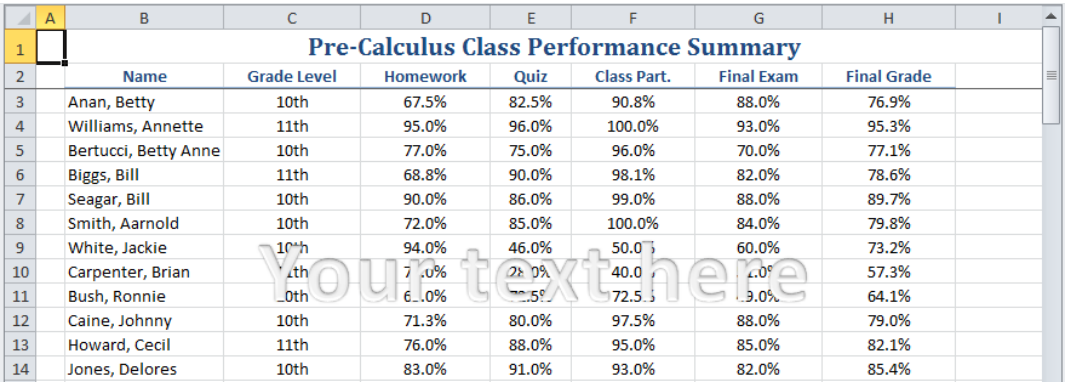
Fiscal Year 2019	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beginning Cash Balance	15,000	11,540	10,040	8,540	7,040	12,040	17,040	22,040	27,040	32,040	40,540	49,040
Sales Revenue	3,500	3,500	3,500	3,500	10,000	10,000	10,000	10,000	10,000	13,500	13,500	13,500
Less: COGS	(1,960)	(1,960)	(1,960)	(1,960)	(5,600)	(5,600)	(5,600)	(5,600)	(5,600)	(7,560)	(7,560)	(7,560)
Total Revenue	1,540	1,540	1,540	1,540	4,400	4,400	4,400	4,400	4,400	5,940	5,940	5,940
Total Cash Available	**16,540**	**15,040**	**13,540**	**12,040**	**17,040**	**22,040**	**27,040**	**32,040**	**37,040**	**45,540**	**54,040**	**62,540**
Cash Payments												
Salaries	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Lease	900	900	900	900	900	900	900	900	900	900	900	900
Advertising	500	500	500	500	500	500	500	500	500	500	500	500
Supplies	200	200	200	200	200	200	200	200	200	200	200	200
Utilities	200	200	200	200	200	200	200	200	200	200	200	200
Credit Card Payments	100	100	100	100	100	100	100	100	100	100	100	100
Misc.	100	100	100	100	100	100	100	100	100	100	100	100
Total Cash Paid Out	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**
Ending Cash Balance	**$ 11,540**	**$ 10,040**	**$ 8,540**	**$ 7,040**	**$ 12,040**	**$ 17,040**	**$ 22,040**	**$ 27,040**	**$ 32,040**	**$ 40,540**	**$ 49,040**	**$ 57,540**

Create a Watermark

1. Click on the Insert tab, then click on WordArt from the Text group.



2. Choose the White, Warm Matte Bevel option.



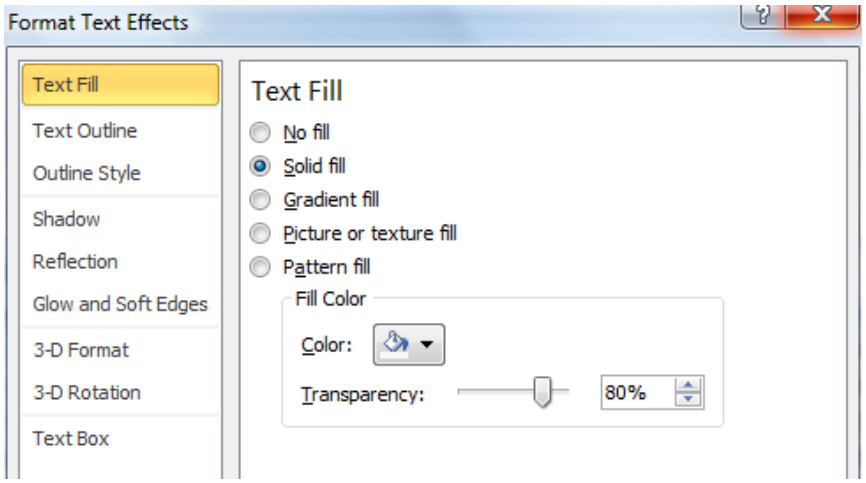
	A	B	C	D	E	F	G	H	I
1		Pre-Calculus Class Performance Summary							
2		Name	Grade Level	Homework	Quiz	Class Part.	Final Exam	Final Grade	
3		Anan, Betty	10th	67.5%	82.5%	90.8%	88.0%	76.9%	
4		Williams, Annette	11th	95.0%	96.0%	100.0%	93.0%	95.3%	
5		Bertucci, Betty Anne	10th	77.0%	75.0%	96.0%	70.0%	77.1%	
6		Biggs, Bill	11th	68.8%	90.0%	98.1%	82.0%	78.6%	
7		Seagar, Bill	10th	90.0%	86.0%	99.0%	88.0%	89.7%	
8		Smith, Aarnold	10th	72.0%	85.0%	100.0%	84.0%	79.8%	
9		White, Jackie	10th	94.0%	46.0%	50.0%	60.0%	73.2%	
10		Carpenter, Brian	11th	71.0%	28.0%	40.0%	42.0%	57.3%	
11		Bush, Ronnie	10th	61.0%	72.5%	72.5%	59.0%	64.1%	
12		Caine, Johnny	10th	71.3%	80.0%	97.5%	88.0%	79.0%	
13		Howard, Cecil	11th	76.0%	88.0%	95.0%	85.0%	82.1%	
14		Jones, Delores	10th	83.0%	91.0%	93.0%	82.0%	85.4%	

3. In this example we will type the word “Confidential” into the text box.

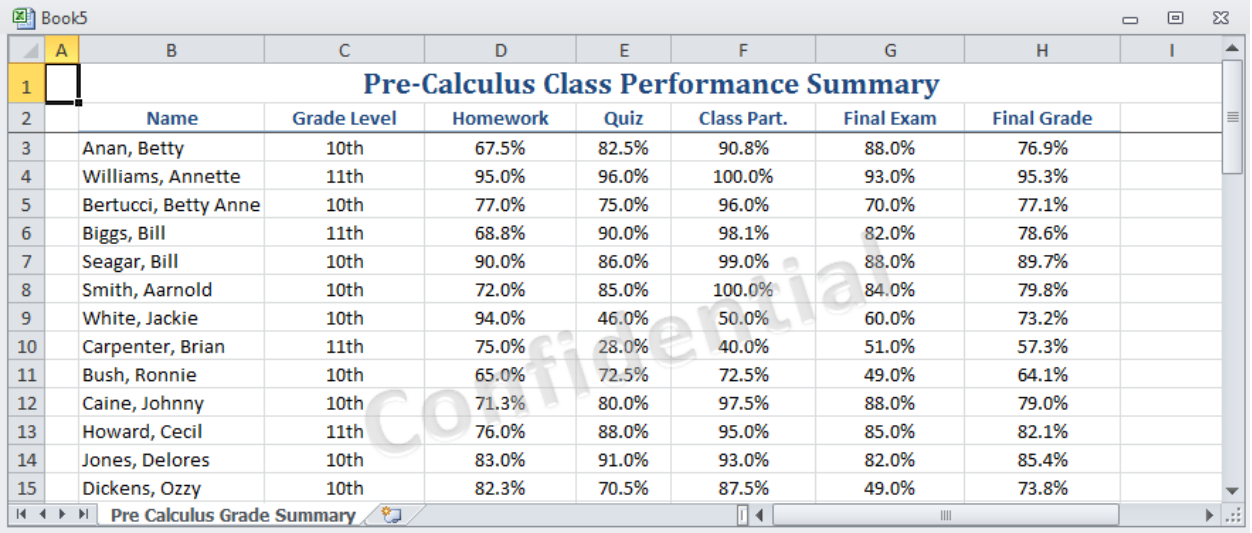
4. Move and stretch the textbox across the desired area of the worksheet. We can rotate the text box using the small green circle at the top of the text box.

5. Right-click on the text box and choose the Font option; change the font size to 72, then click OK.

6. Right-click on the text box again and choose Format Text Effects.



7. Choose Text Fill, Solid Fill and then set the Transparency to 80%; click on the Close button.



Book5

	A	B	C	D	E	F	G	H	I
1		Pre-Calculus Class Performance Summary							
2		Name	Grade Level	Homework	Quiz	Class Part.	Final Exam	Final Grade	
3		Anan, Betty	10th	67.5%	82.5%	90.8%	88.0%	76.9%	
4		Williams, Annette	11th	95.0%	96.0%	100.0%	93.0%	95.3%	
5		Bertucci, Betty Anne	10th	77.0%	75.0%	96.0%	70.0%	77.1%	
6		Biggs, Bill	11th	68.8%	90.0%	98.1%	82.0%	78.6%	
7		Seagar, Bill	10th	90.0%	86.0%	99.0%	88.0%	89.7%	
8		Smith, Aarnold	10th	72.0%	85.0%	100.0%	84.0%	79.8%	
9		White, Jackie	10th	94.0%	46.0%	50.0%	60.0%	73.2%	
10		Carpenter, Brian	11th	75.0%	28.0%	40.0%	51.0%	57.3%	
11		Bush, Ronnie	10th	65.0%	72.5%	72.5%	49.0%	64.1%	
12		Caine, Johnny	10th	71.3%	80.0%	97.5%	88.0%	79.0%	
13		Howard, Cecil	11th	76.0%	88.0%	95.0%	85.0%	82.1%	
14		Jones, Delores	10th	83.0%	91.0%	93.0%	82.0%	85.4%	
15		Dickens, Ozzy	10th	82.3%	70.5%	87.5%	49.0%	73.8%	

Pre Calculus Grade Summary

Chapter 7: What-If Analysis

This chapter will introduce four different types of What-If analysis tools

- Goal Seek
- Scenario Manager
- One and Two-Input Data Tables
- The Solver add-in

Goal Seek

This What-If analysis tool helps find the values necessary to achieve a particular result. Let's say you own a small business and you want to earn a total of $250,000 this year in operating income (also referred to as before-tax income). What sales revenue amount would the company need to earn in the last quarter of the year in order to achieve that goal?

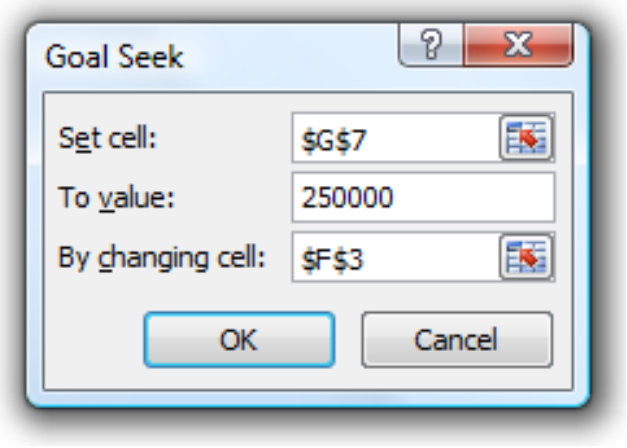
1. Choose the cell where the data is to be inputted. This cell must contain a formula or a function, which in this case is cell G7:

	A	B	C	D	E	F	G
1		Sales Forecast					
2			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total:
3		Sales	$ 284,233	$ 382,423	$ 323,543		$ 990,199
4		Cost of Goods Sold	$ (204,648)	$ (275,345)	$ (232,951)	$ (351,868)	$ (1,064,812)
5		Gross Profit	$ 79,585	$ 107,078	$ 90,592	$ (351,868)	$ (74,613)
6		Expenses	$ (48,320)	$ (41,761)	$ (35,331)	$ (38,682)	$ (164,094)
7		Operating Income	$ 31,265	$ 65,317	$ 55,261	$ (390,550)	$ (238,707)

1

2. Click on the Data tab → Data tools group → What-If Analysis button → Goal Seek…
3. The Goal Seek Dialog box will open. The dialog box is where you input the data needed to get the result.

Set cell: G7 is where the current value of $(238,707) is located
To value: Input the goal of $250,000
By changing cell: We want to see what sales revenue number in the fourth quarter would be to generate an operating income of $250,000, so we will click on cell F3; click OK.



The results will appear in cells F3 and G7:

	A	B	C	D	E	F	G
1		Sales Forecast					
2			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total:
3		**Sales**	$ 284,233	$ 382,423	$ 323,543	$ 488,707	$ 1,478,906
4		Cost of Goods Sold	$ (204,648)	$ (275,345)	$ (232,951)	$ (351,868)	$ (1,064,812)
5		Gross Profit	$ 79,585	$ 107,078	$ 90,592	$ 136,839	$ 414,094
6		Expenses	$ (48,320)	$ (41,761)	$ (35,331)	$ (38,682)	$ (164,094)
7		Operating Income	$ 31,265	$ 65,317	$ 55,261	$ 98,157	$ 250,000

3

The Goal Seek solution finds that in order to achieve an operating income of $250,000 (cell G7), the sales forecast number would need to be $488,706 (cell F3).

Scenario Manager

This tool will create spreadsheets that show you how changes in one or more values will change other values.

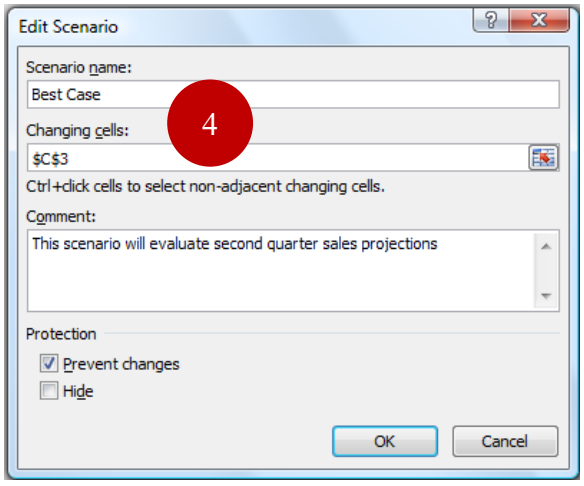
A business owner put together a forecasted income statement that reflects the expected sales performance for next month. They would also like to see what a best case and worst-case scenario would look like.

	A	B	C
1			
2		Forecasted Income Statement	
3		Revenue	140,000
4		Cost of Goods Sold	100,800
5		Gross Profit	$ 39,200
6		Expenses	
7		Salary and Wages	4,023
8		Supply Expenses	4,232
9		Insurance	2,412
10		Total Expenses	10,667
11		Operating Profit	$ 28,533
12		Tax	(9,701)
13		Net Profit	$ 18,832
14		Profit Margin	13%

1

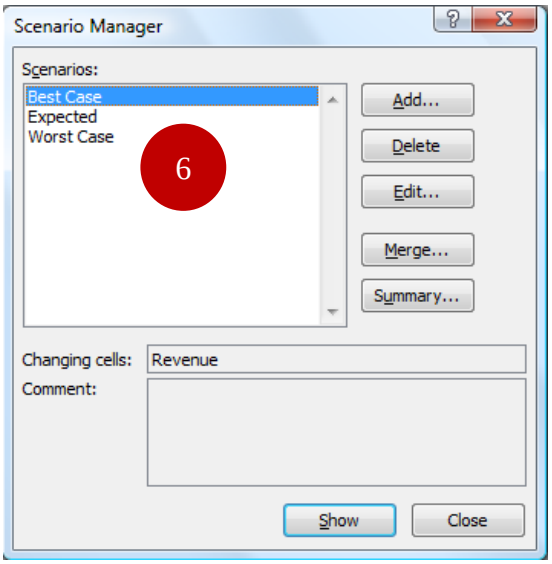
1. Click on the Revenue cell (C3).
2. Click on the Data tab, choose Scenario Manager from the What-If Analysis group.

3. Choose Add…
4. Give the first scenario the name “Best Case”.
5. Click OK. The Scenario Values dialog box will appear.



4

6. Type in the Revenue amount ($170,000); click OK. Repeat these steps to enter “Expected”, 140,000 and “Worst Case”, 120,000. After you enter the last one, you will see the names of the scenarios you created in the dialog box.



7. Click on the different Scenarios then click Show to see the results of each. Click Summary, then Scenario Summary to create a summary report. You can then make changes to the colors and font sizes:

Scenario Summary

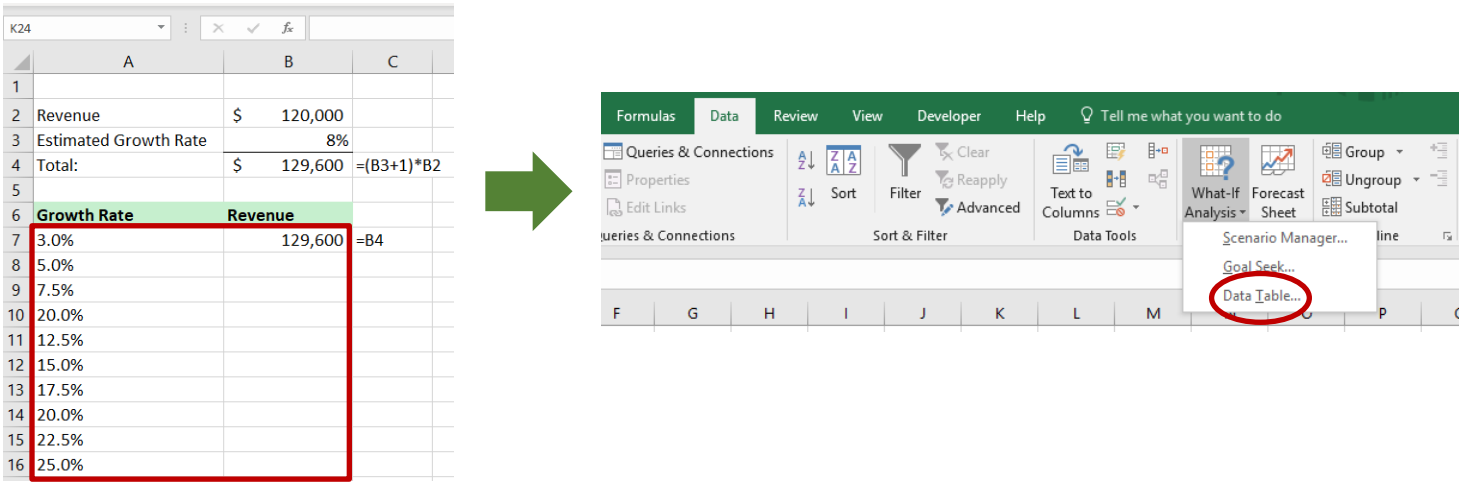
	Current Values:	Worst Case	Expected	Best Case
Changing Cells:				
Revenue	140,000	120,000	140,000	170,000
Result Cells:				
Revenue	140,000	120,000	140,000	170,000
COGS	100,800	100,800	100,800	100,800
GrossProfit	$ 39,200	$ 19,200	$ 39,200	$ 69,200
$C$6				
SalaryandWages	4,023	4,023	4,023	4,023
SupplyExpenses	4,232	4,232	4,232	4,232
Insurance	2,412	2,412	2,412	2,412
TotalExpenses	10,667	10,667	10,667	10,667
OperatingProfit	$ 28,533	$ 8,533	$ 28,533	$ 58,533
Tax	(9,701)	(9,701)	(9,701)	(9,701)
NetProfit	$ 18,832	$ (1,168)	$ 18,832	$ 48,832
ProfitMargin	13%	-1%	13%	29%

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

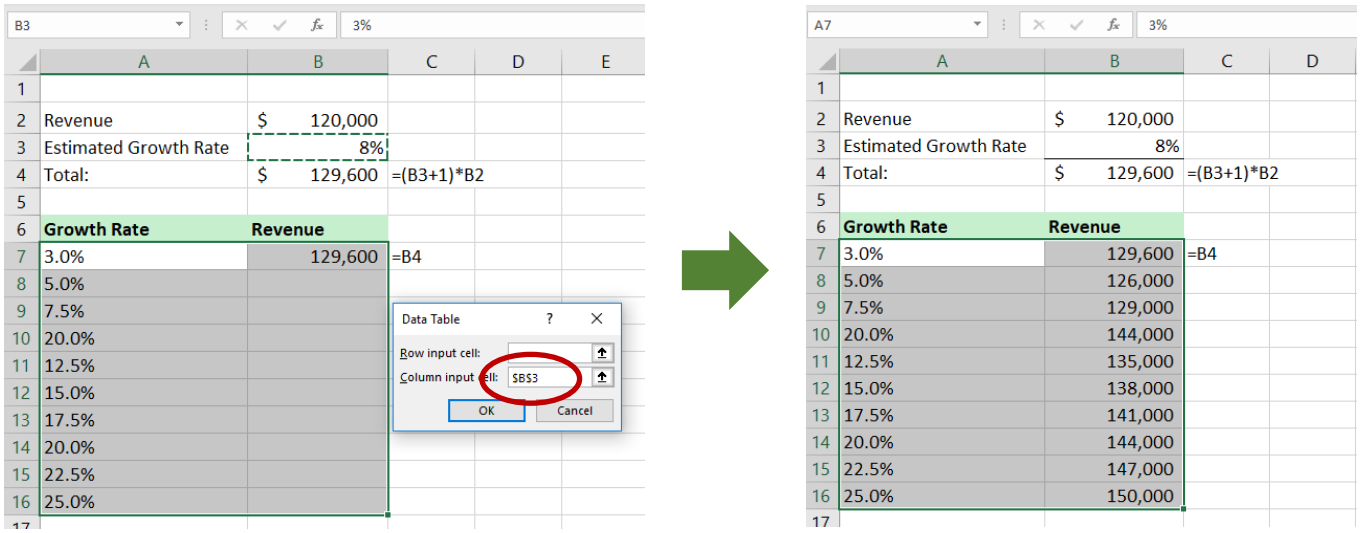
Data Tables

Data tables are used when you need to evaluate a large number of values at one time. For example, you may want to summarize the result of several different interest rates or growth rates and how they will impact projected sales.

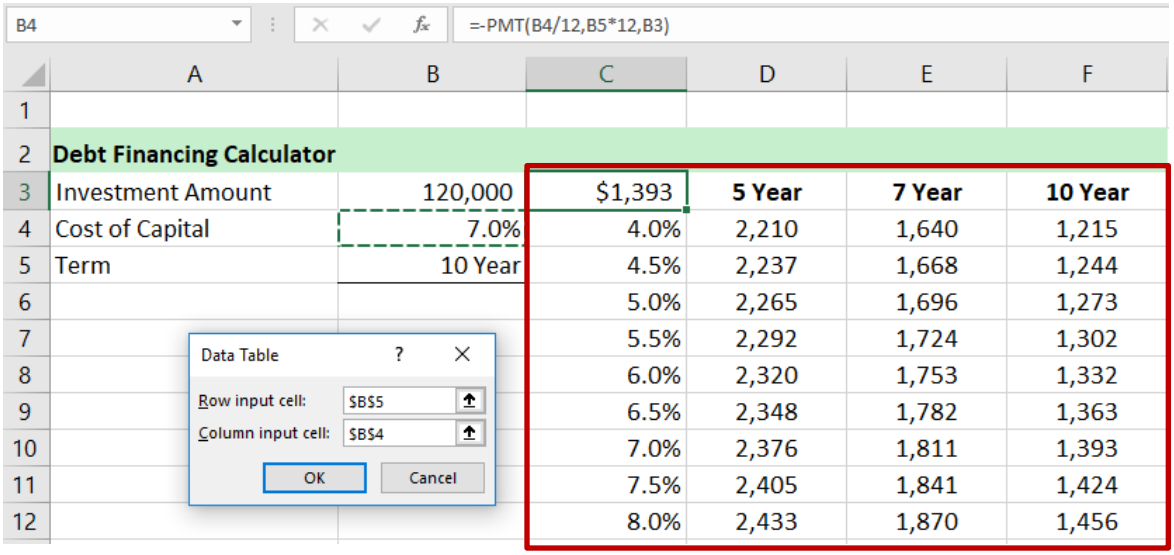
To create a Data Table that calculates growth rates, you can first input a growth rate formula into cell B4, which would be =(B3+1)*B2. This formula will also be used in the Data Table, so you can then click on cell B7 and input =B4. Select all the cells where the results will be inputted. Click on What-If Analysis, then click on Data Table…



From here you want to use the Data Table dialog box and tab down to where it says Column input cell. Click on cell B3; click OK. Cells B7 to B16 show the project sales numbers automatically multiplied by the corresponding growth rate figures:



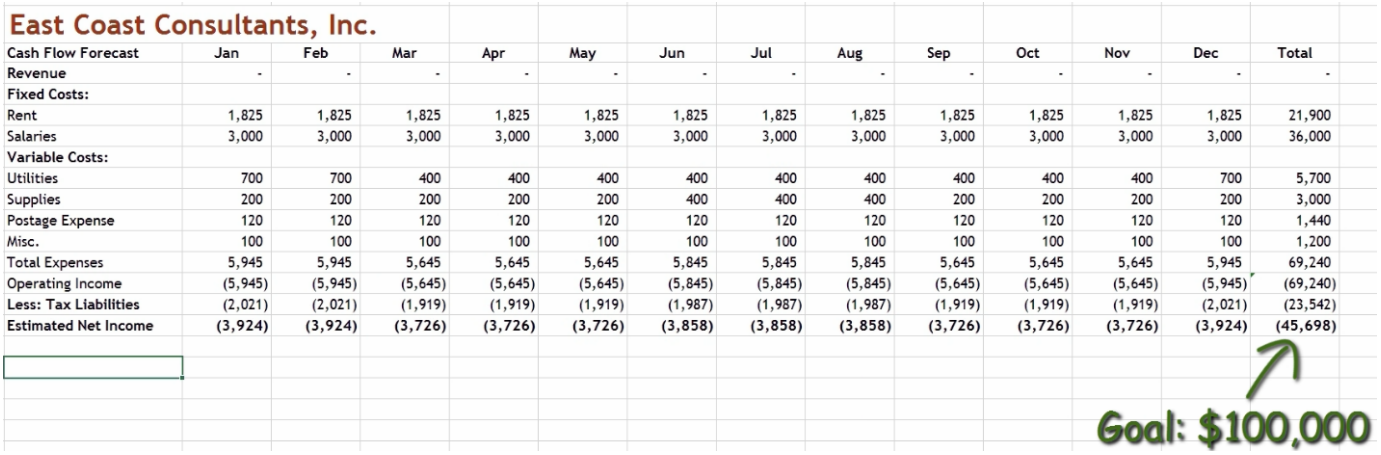
For a **two-input** Data Table, we want to look at both the rate and the time period in order to get a summary of different scenarios. Cell C3 has the PMT function, which gives us the monthly payment amounts based on the inputs from cells B3 to B5. Select cells C3 to F12, then choose Data Tables from the What-If Analysis Group. The Row input will be the Term (B5) and the Column input will be the Borrowing Rate (B4):



Solver

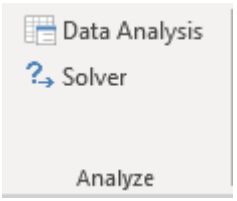
The Solver tool is a bit more complex than the other What-If analysis tools we've looked at so far. In the Goal Seek example, we clicked on **one cell** under "By Changing Cell" to get a result. With Solver, you can select an entire **range of cells** in order to get a result.

The owner of a business wants to earn an after-tax income (also known as net income) of $100,000; what sales revenue amount will they need to generate every month to achieve that number?



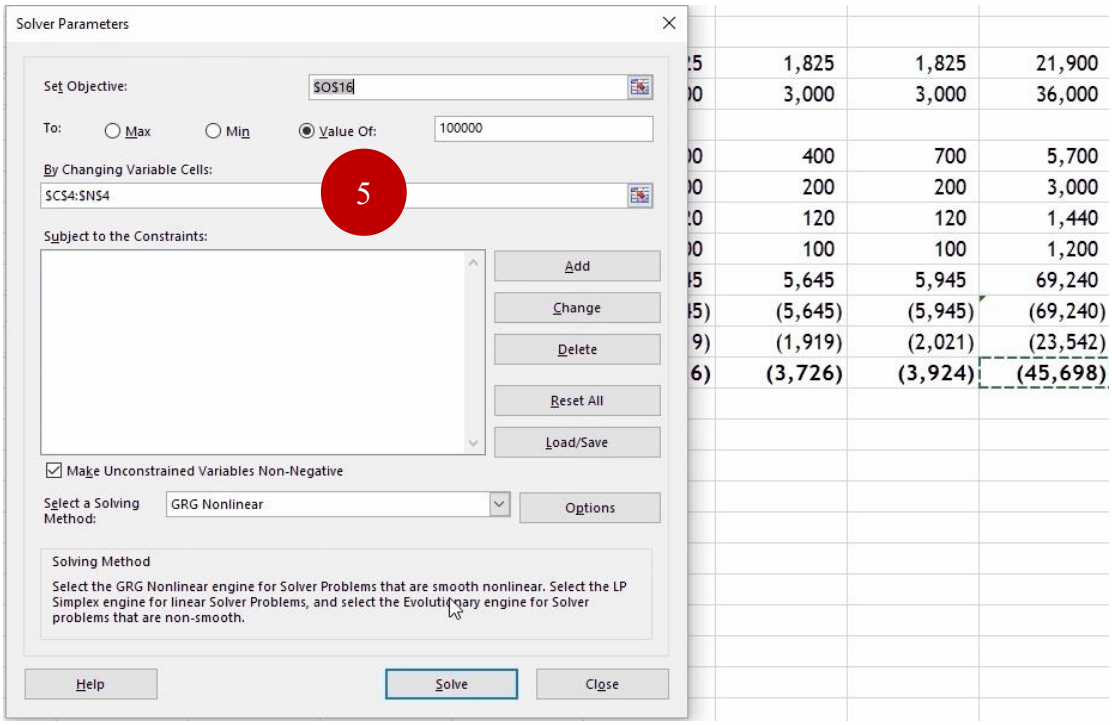
Cash Flow Forecast	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed Costs:													
Rent	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	21,900
Salaries	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	36,000
Variable Costs:													
Utilities	700	700	400	400	400	400	400	400	400	400	400	700	5,700
Supplies	200	200	200	200	200	400	400	400	200	200	200	200	3,000
Postage Expense	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Misc.	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Total Expenses	5,945	5,945	5,645	5,645	5,645	5,845	5,845	5,845	5,645	5,645	5,645	5,945	69,240
Operating Income	(5,945)	(5,945)	(5,645)	(5,645)	(5,645)	(5,845)	(5,845)	(5,845)	(5,645)	(5,645)	(5,645)	(5,945)	(69,240)
Less: Tax Liabilities	(2,021)	(2,021)	(1,919)	(1,919)	(1,919)	(1,987)	(1,987)	(1,987)	(1,919)	(1,919)	(1,919)	(2,021)	(23,542)
Estimated Net Income	(3,924)	(3,924)	(3,726)	(3,726)	(3,726)	(3,858)	(3,858)	(3,858)	(3,726)	(3,726)	(3,726)	(3,924)	(45,698)

If the Solver tool has not been added to the Ribbon, click on the File tab. Go to Options, Add-Ins, Excel Add-in and choose Solver. Solver will now appear in the Analyze group under the Data tab:

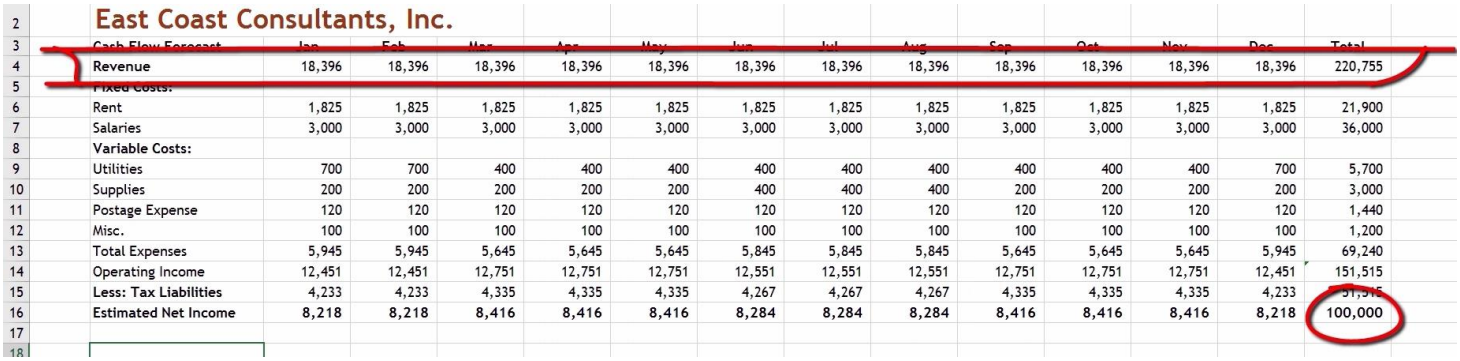


1. To use Solver, click on the cell that will be used to calculate the Solver values, which in this example is the revenue number (cell O16); click on Solver.

2. Under Value of, input 100,000; under By Changing Variable Cells, choose cells C4 to N4. Click Solve, then press Enter.



The worksheet now displays the revenue numbers that need to be reached each month to achieve the net income goal of 100,000:



East Coast Consultants, Inc.

Cash Flow Forecast	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Revenue	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	18,396	220,755
Fixed Costs:													
Rent	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	21,900
Salaries	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	36,000
Variable Costs:													
Utilities	700	700	400	400	400	400	400	400	400	400	400	700	5,700
Supplies	200	200	200	200	200	400	400	400	200	200	200	200	3,000
Postage Expense	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Misc.	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Total Expenses	5,945	5,945	5,645	5,645	5,645	5,845	5,845	5,845	5,645	5,645	5,645	5,945	69,240
Operating Income	12,451	12,451	12,751	12,751	12,751	12,551	12,551	12,551	12,751	12,751	12,751	12,451	151,515
Less: Tax Liabilities	4,233	4,233	4,335	4,335	4,335	4,267	4,267	4,267	4,335	4,335	4,335	4,233	51,515
Estimated Net Income	8,218	8,218	8,416	8,416	8,416	8,284	8,284	8,284	8,416	8,416	8,416	8,218	100,000

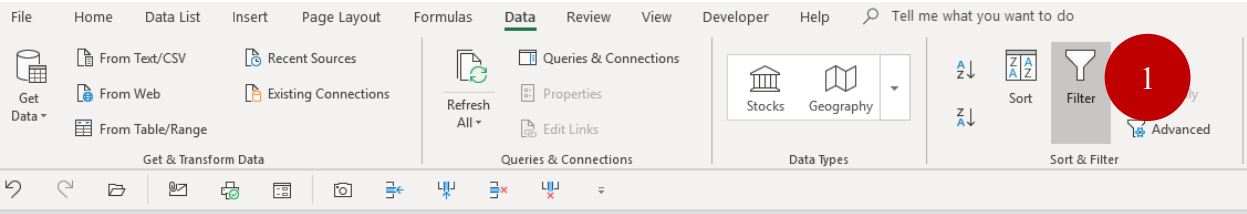
Chapter 8: Sorting and Filtering Data

The Sort and Filter tools are helpful when you have a large amount of text and numbers in a list or table and you want to be able to view specific details related to them. For example, a retail store may want to know what the best-selling products were for a given month and will need to sort the data in order to generate a report.

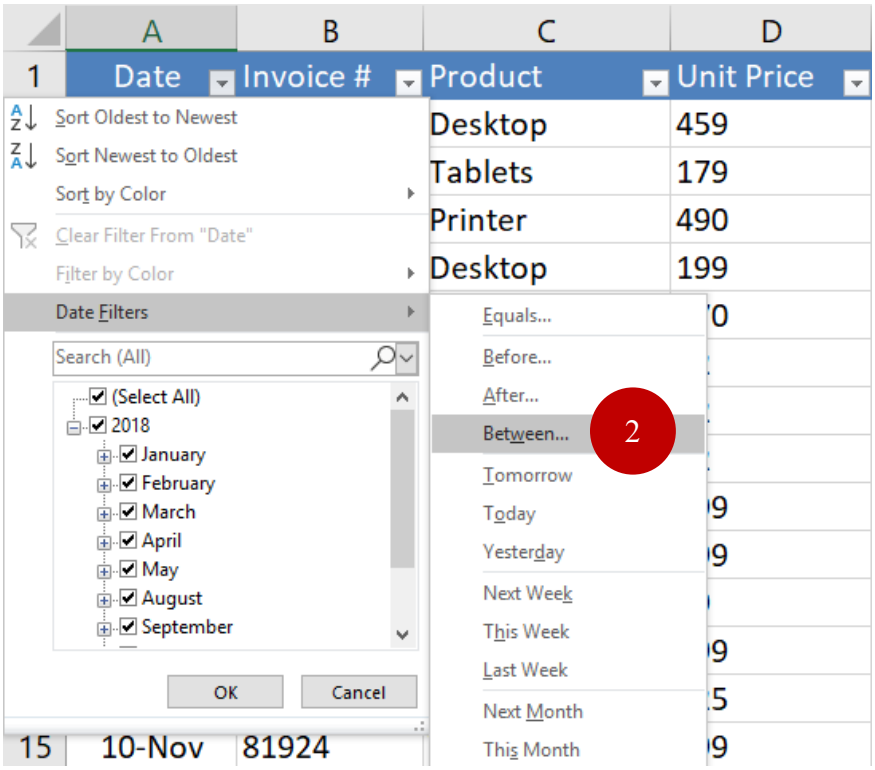
Filtering Data

Let's say in this example that you want to review sales numbers from the last two weeks in October.

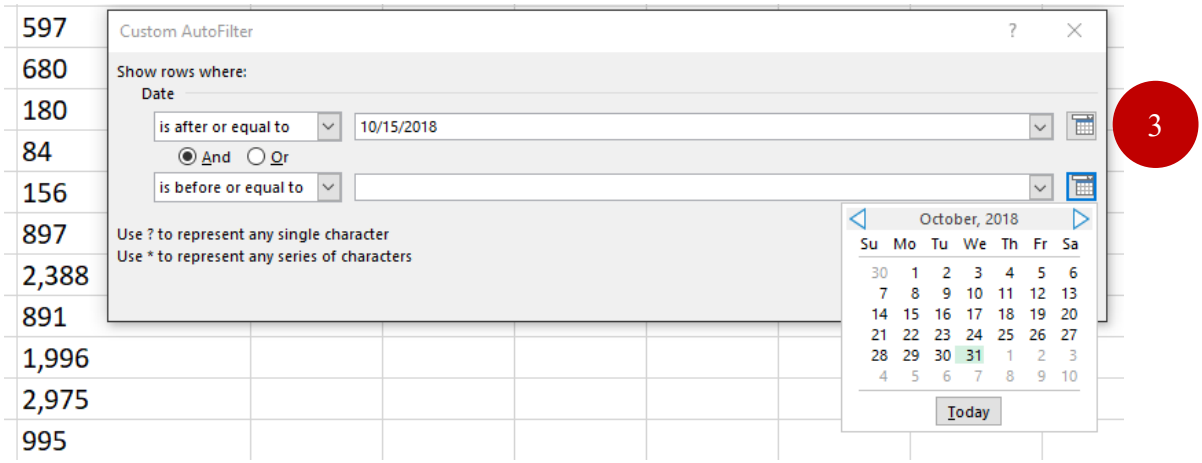
1. Click on cell A1, then click on the Data tab on the ribbon; click on Filter.



2. Go to the Date and click on the down arrow and choose Date Filters; click on Between.

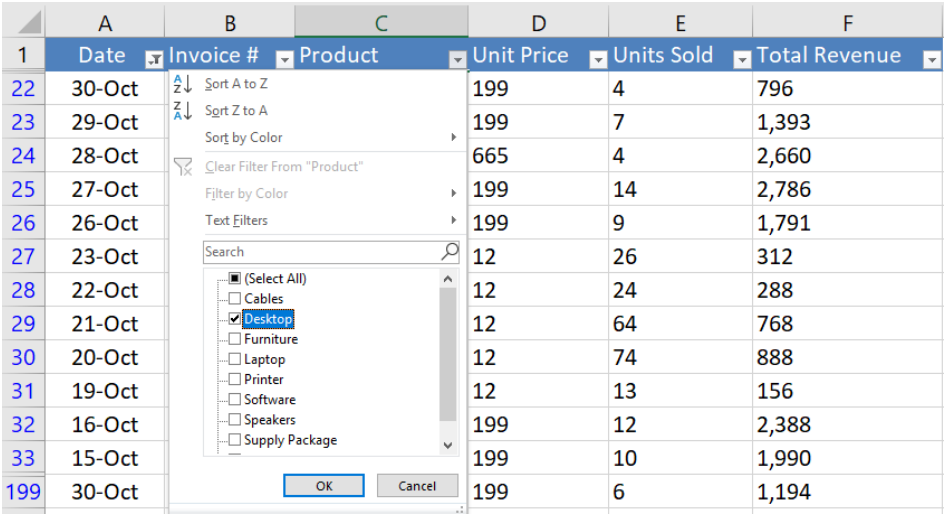


3. From here, we can use the calendar button to select the dates, which in this case will be October 15th to October 31st. After the dates are selected, click OK.



A second filter can be applied to only show the sale of desktop computers between those dates.

4. Click on the Product filter down arrow.
5. Uncheck Select All, then check off Desktop; click OK.



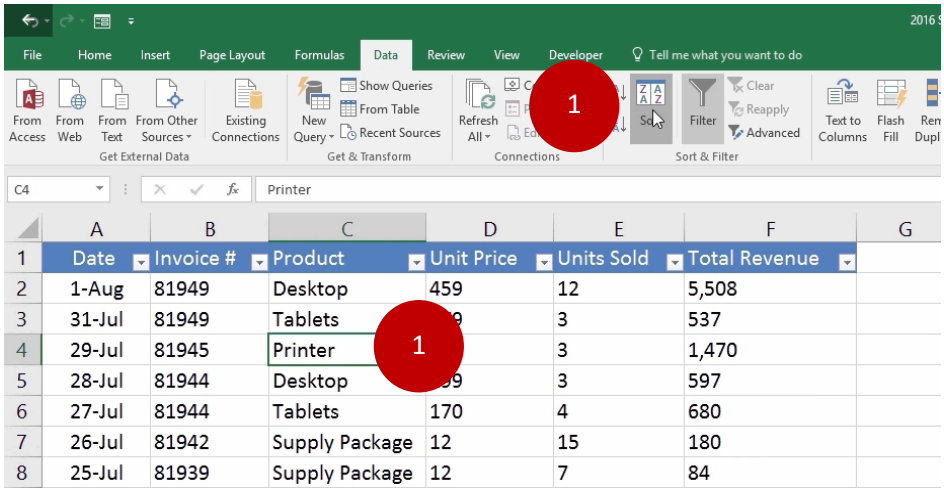
	A	B	C	D	E	F
1	Date	Invoice #	Product	Unit Price	Units Sold	Total Revenue
22	30-Oct			199	4	796
23	29-Oct			199	7	1,393
24	28-Oct			665	4	2,660
25	27-Oct			199	14	2,786
26	26-Oct			199	9	1,791
27	23-Oct			12	26	312
28	22-Oct			12	24	288
29	21-Oct			12	64	768
30	20-Oct			12	74	888
31	19-Oct			12	13	156
32	16-Oct			199	12	2,388
33	15-Oct			199	10	1,990
199	30-Oct			199	6	1,194

6. You will now see the desktop computer sales numbers between October 15th and October 31st:

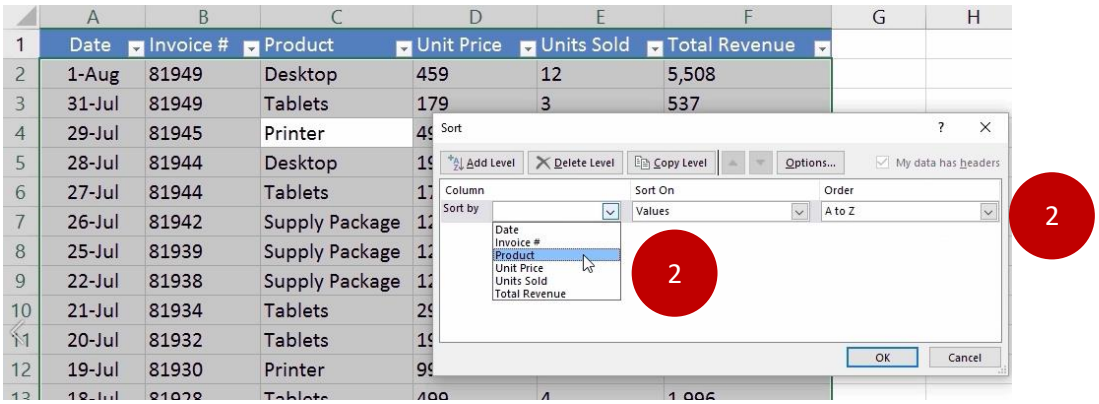
	A	B	C	D	E	F
1	Date	Invoice #	Product	Unit Price	Units Sold	Total Revenue
26	26-Oct	81954	Desktop	199	9	1,791
32	16-Oct	81924	Desktop	199	12	2,388
33	15-Oct	81942	Desktop	199	10	1,990
200	29-Oct	81924	Desktop	199	4	796
201	28-Oct	81924	Desktop	199	5	995
230						

Sorting Data

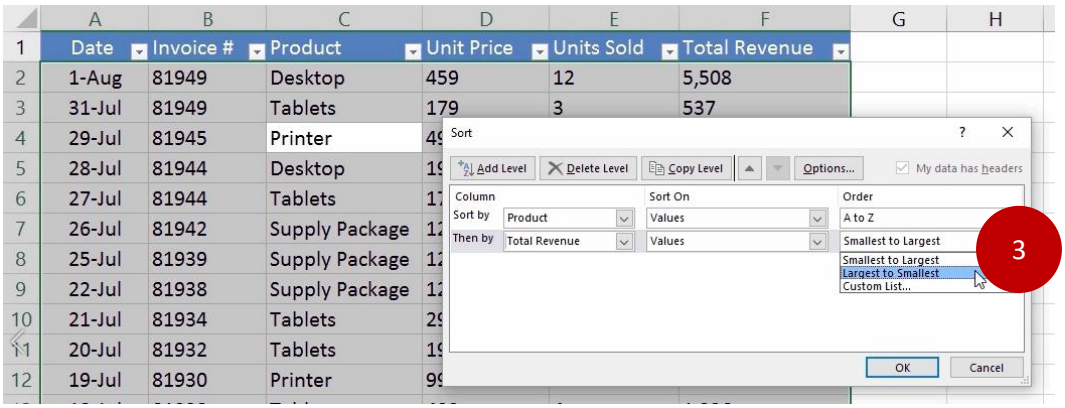
1. Click on cell C4, then click on the Data tab; click on the Sort dialog box:



2. Under **Sort By**, choose Product; under **Order**, choose A to Z.



3. Click on Add Level.
4. Under **Then By**, choose Total Revenue; under **Order**, choose Largest to Smallest; Click OK.

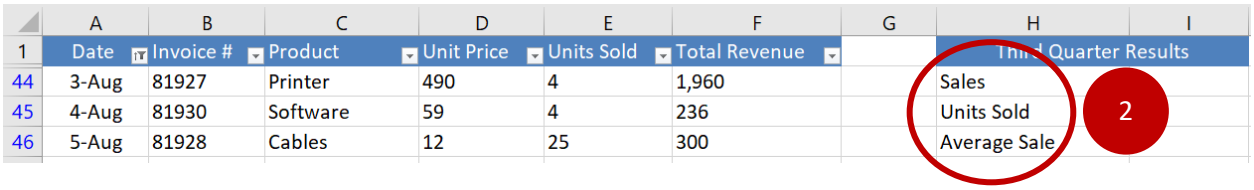


Using the SUBTOTAL function

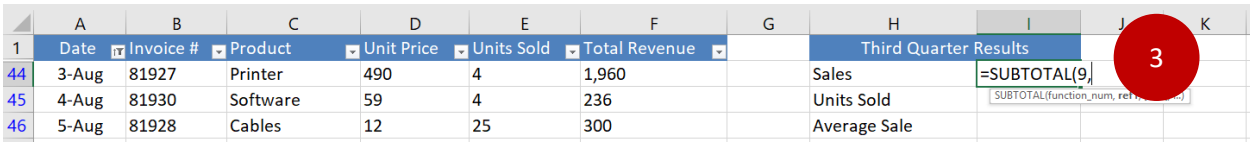
To perform calculations on filtered data, you must use the SUBTOTAL function to avoid including numbers you can't see because of the filter.

1. Go to the Date filter and choose Between. Choose the dates July 1st and September 30th. Sort the data from A to Z.

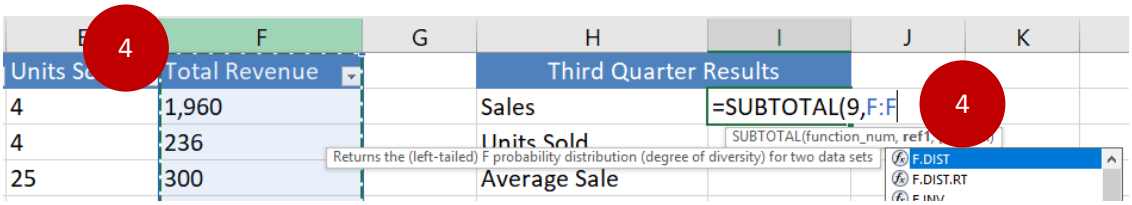
2. Input Titles in the Rows; Sales, Units Sold and Average Sale:



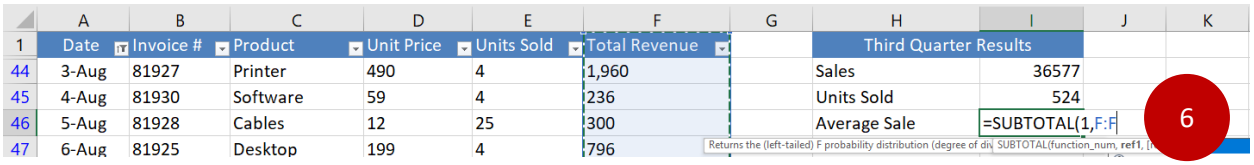
3. Input the SUBTOTAL function into the cell next to Sales; press the Tab key; double-click 9, then input a comma:



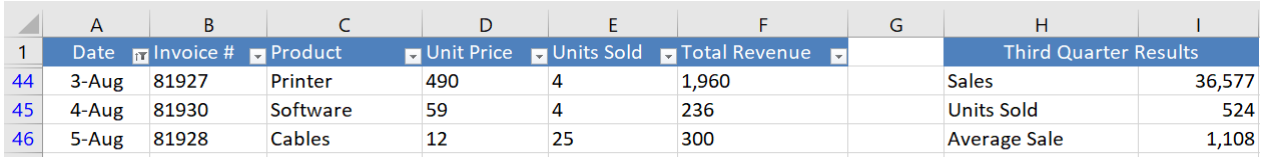
4. Click on the top of column F; press Enter:



5. Repeat these steps for Units Sold.
6. Input the SUBTOTAL function for Average Sale but this time click on number 1).

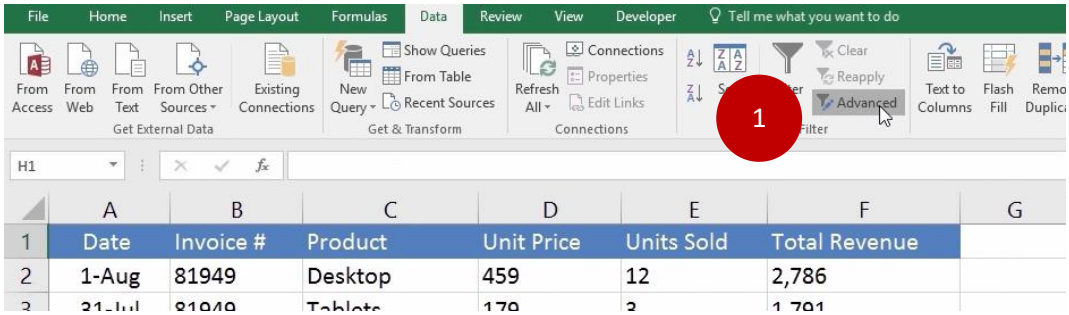


7. Adjust the number formats as needed.

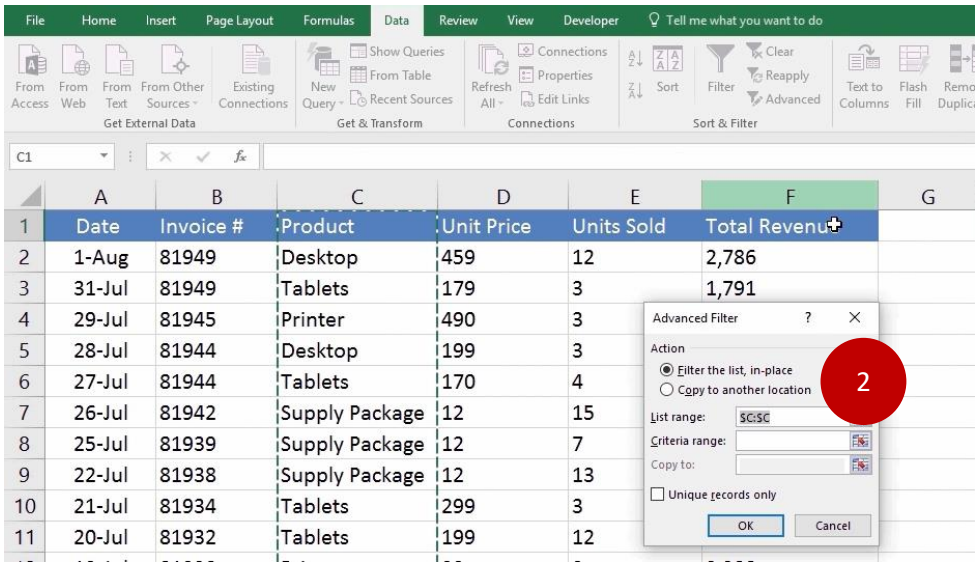


Advanced Filters

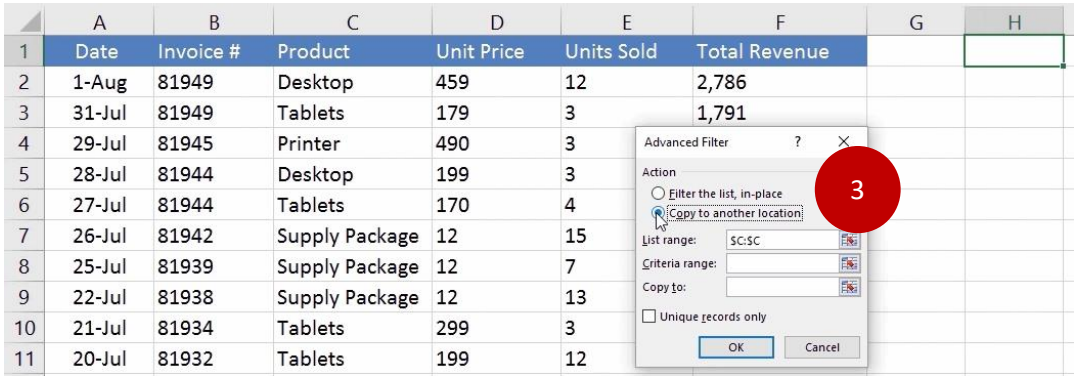
1. Click on cell H1. With the Data tab selected, click on Advanced Filter.



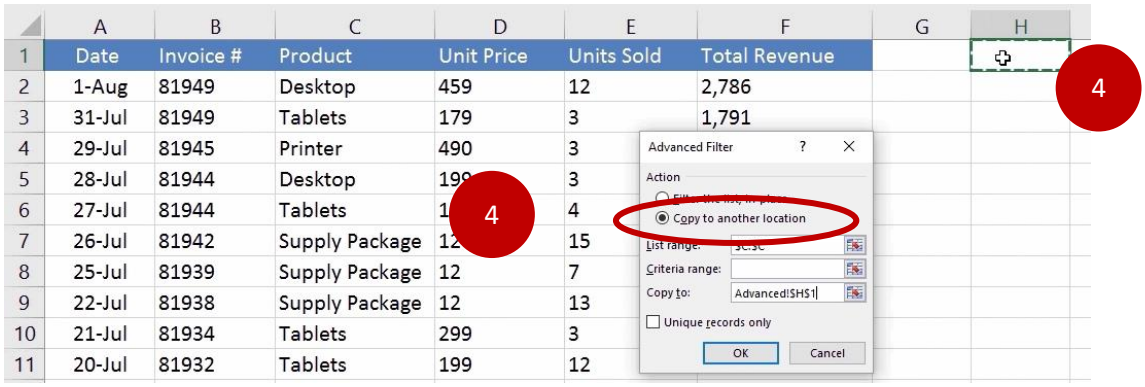
2. Click inside the List range space, then click on the top of column C to select it.



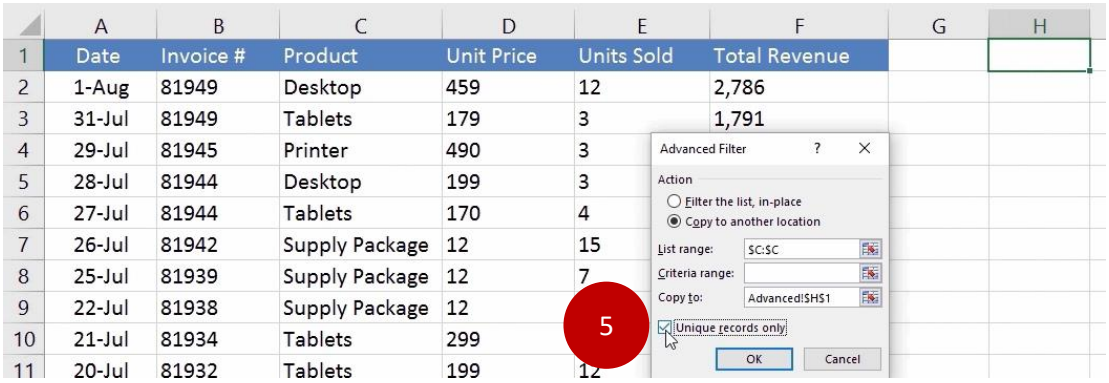
3. Select Copy to another location under Action:



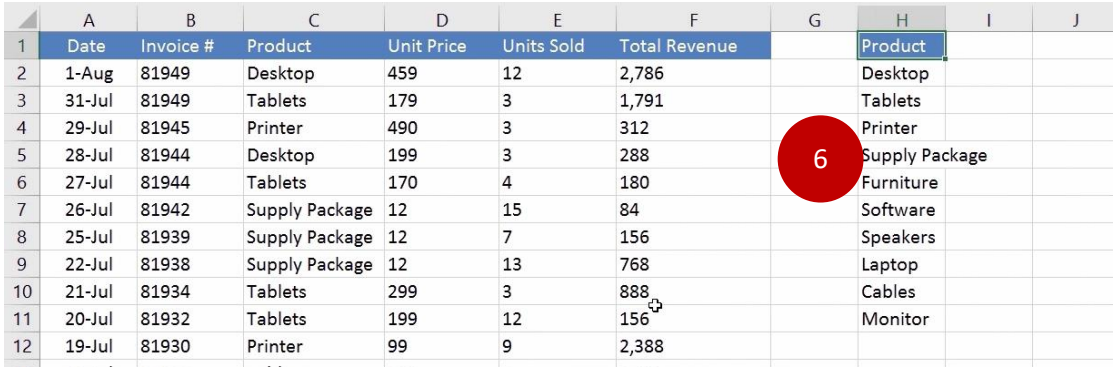
4. Click on the space next to Copy to another location, then click on cell H1.



5. Check off Unique Records Only, Click OK.

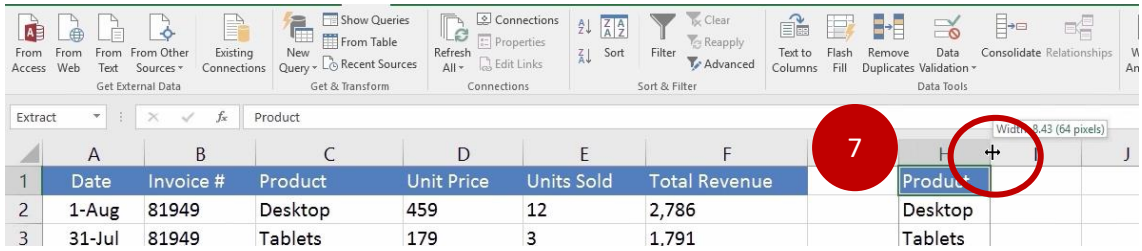


6. Column H should now look like this:

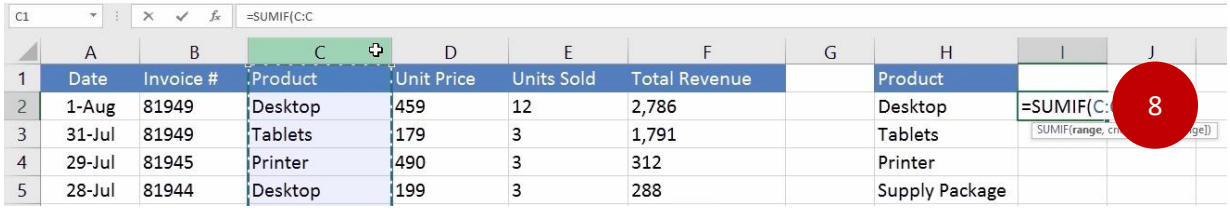


	A	B	C	D	E	F	G	H	I	J
1	Date	Invoice #	Product	Unit Price	Units Sold	Total Revenue		Product		
2	1-Aug	81949	Desktop	459	12	2,786		Desktop		
3	31-Jul	81949	Tablets	179	3	1,791		Tablets		
4	29-Jul	81945	Printer	490	3	312		Printer		
5	28-Jul	81944	Desktop	199	3	288		Supply Package		
6	27-Jul	81944	Tablets	170	4	180		Furniture		
7	26-Jul	81942	Supply Package	12	15	84		Software		
8	25-Jul	81939	Supply Package	12	7	156		Speakers		
9	22-Jul	81938	Supply Package	12	13	768		Laptop		
10	21-Jul	81934	Tablets	299	3	888		Cables		
11	20-Jul	81932	Tablets	199	12	156		Monitor		
12	19-Jul	81930	Printer	99	9	2,388				

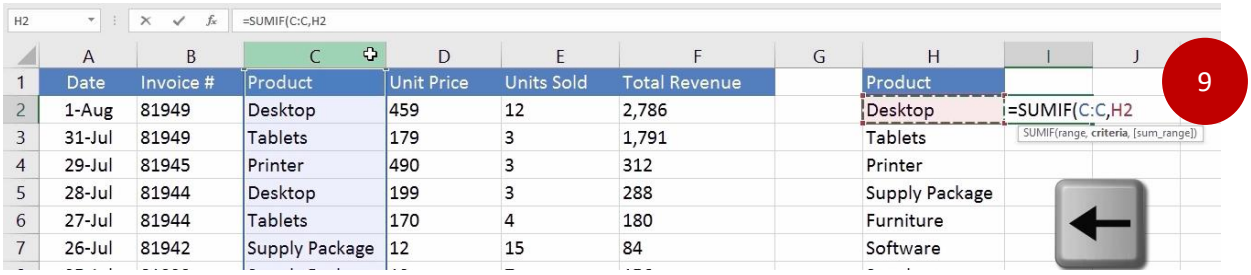
7. Double-click on column H to make the column wider.



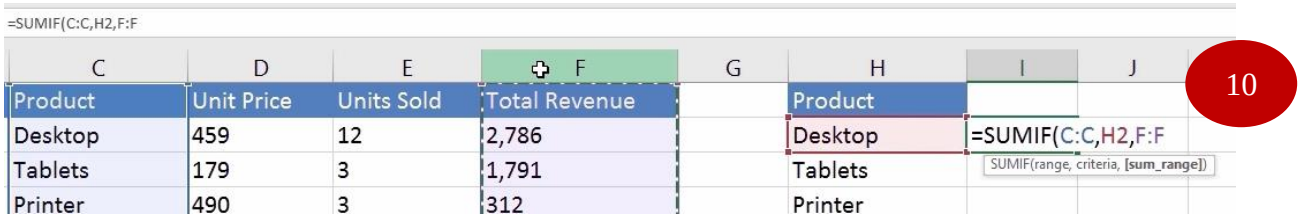
8. Click on cell I2 and input the SUMIF function; click on column C.



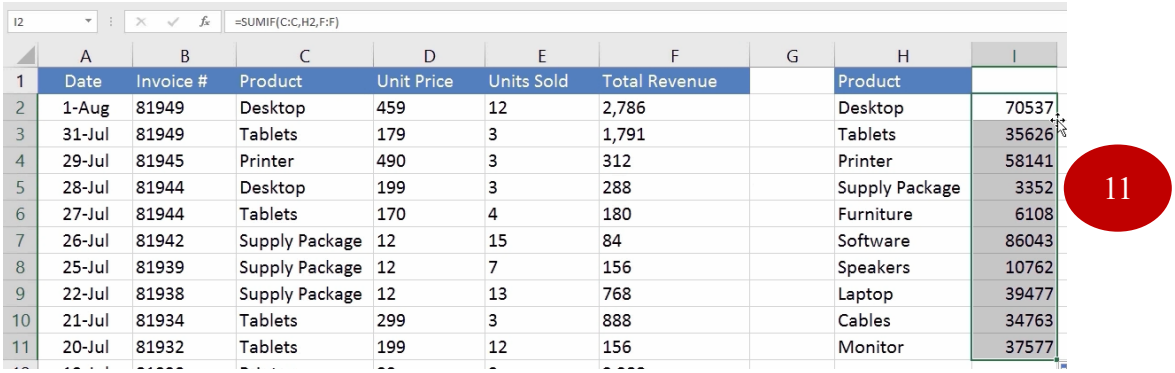
9. Input a comma; use the left arrow to select “Desktop” (cell H2).



10. Input a comma; click on column F, then press Enter.

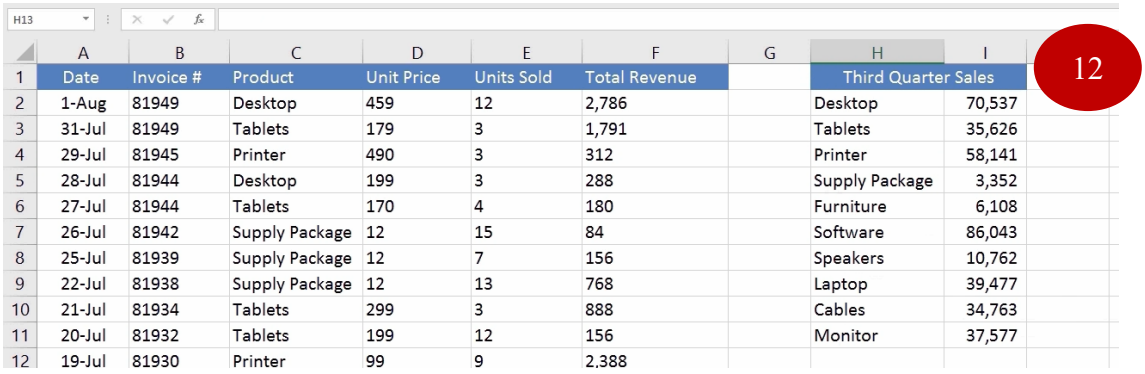


11. Double-click on the lower left corner of cell I2 to Autofill the rest of the column.



	A	B	C	D	E	F	G	H	I
1	Date	Invoice #	Product	Unit Price	Units Sold	Total Revenue		Product	
2	1-Aug	81949	Desktop	459	12	2,786		Desktop	70537
3	31-Jul	81949	Tablets	179	3	1,791		Tablets	35626
4	29-Jul	81945	Printer	490	3	312		Printer	58141
5	28-Jul	81944	Desktop	199	3	288		Supply Package	3352
6	27-Jul	81944	Tablets	170	4	180		Furniture	6108
7	26-Jul	81942	Supply Package	12	15	84		Software	86043
8	25-Jul	81939	Supply Package	12	7	156		Speakers	10762
9	22-Jul	81938	Supply Package	12	13	768		Laptop	39477
10	21-Jul	81934	Tablets	299	3	888		Cables	34763
11	20-Jul	81932	Tablets	199	12	156		Monitor	37577

12. Change the cell formats in column I2 and change the column title.

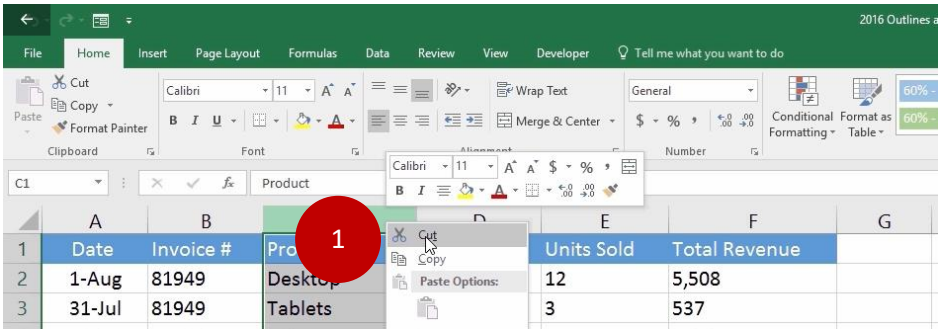


	A	B	C	D	E	F	G	H	I
1	Date	Invoice #	Product	Unit Price	Units Sold	Total Revenue		Third Quarter Sales	
2	1-Aug	81949	Desktop	459	12	2,786		Desktop	70,537
3	31-Jul	81949	Tablets	179	3	1,791		Tablets	35,626
4	29-Jul	81945	Printer	490	3	312		Printer	58,141
5	28-Jul	81944	Desktop	199	3	288		Supply Package	3,352
6	27-Jul	81944	Tablets	170	4	180		Furniture	6,108
7	26-Jul	81942	Supply Package	12	15	84		Software	86,043
8	25-Jul	81939	Supply Package	12	7	156		Speakers	10,762
9	22-Jul	81938	Supply Package	12	13	768		Laptop	39,477
10	21-Jul	81934	Tablets	299	3	888		Cables	34,763
11	20-Jul	81932	Tablets	199	12	156		Monitor	37,577
12	19-Jul	81930	Printer	99	9	2.388			

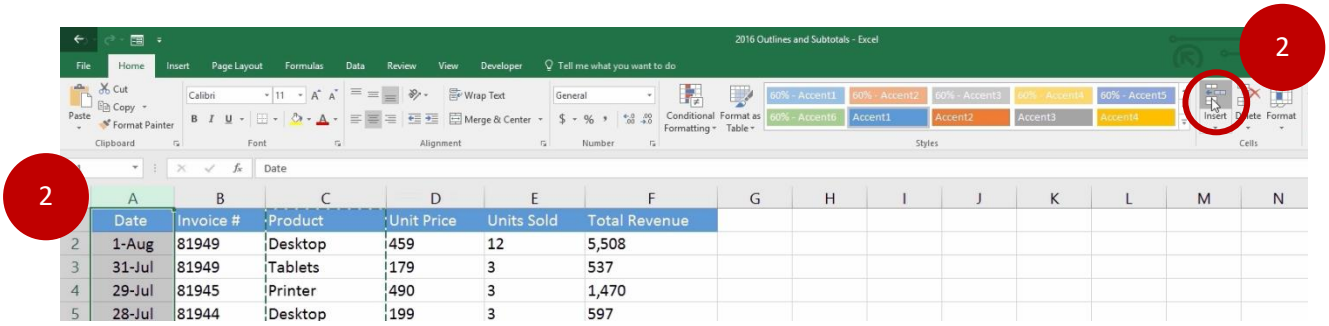
Outlines and Subtotals

Lists that have multiple instances of the same information, such as names of employees or departments, can be viewed as an outline. In this example, a wholesale company delivers products to retail stores and wants to keep track of daily sales. They created a spreadsheet with data sorted by store location, so that subtotal number of units sold and revenue can be displayed. To do an Outline, however, they want the data to be organized by product.

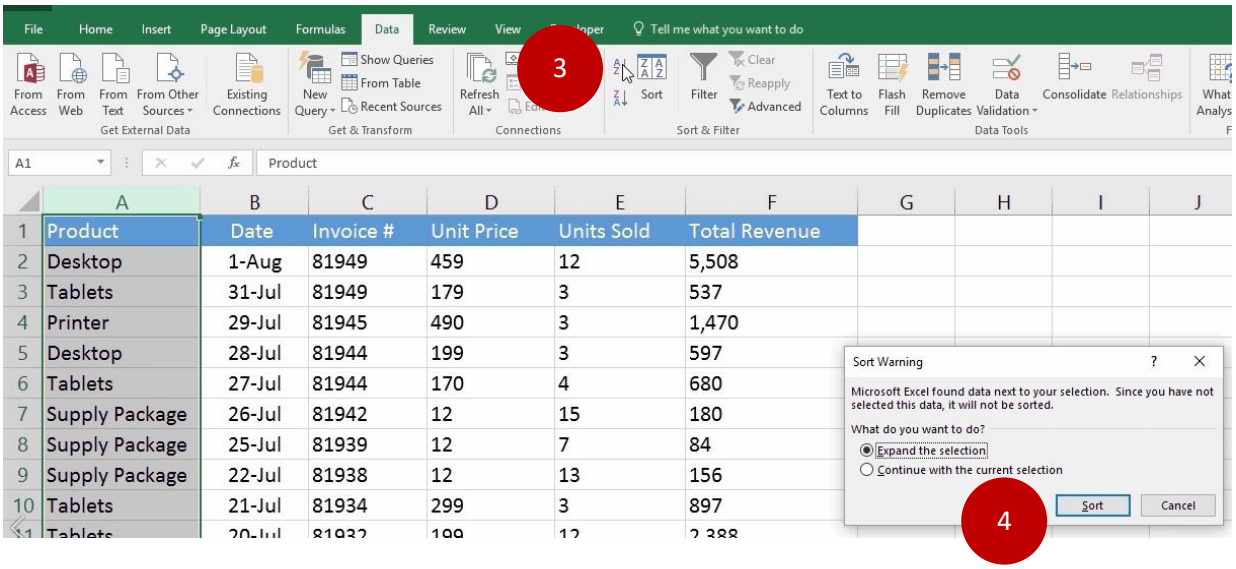
1. Click on Column C (Product); right click and choose Cut.



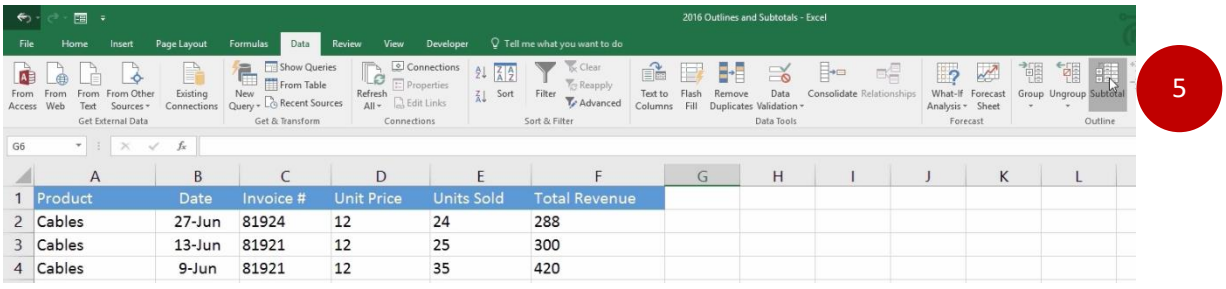
2. Click on Column A; click on the Home tab and choose Insert from the Cells group.



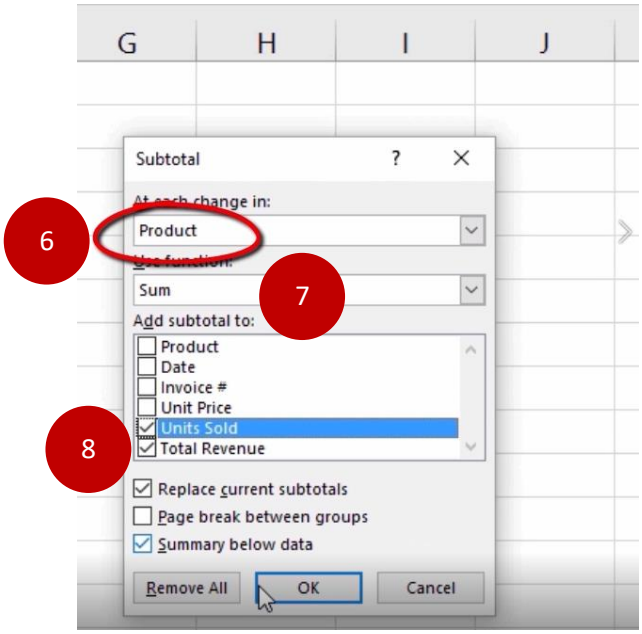
3. With column A still selected, go to the Data tab, then click on the AZ button.
4. With Expand the selection checked off, click Sort.



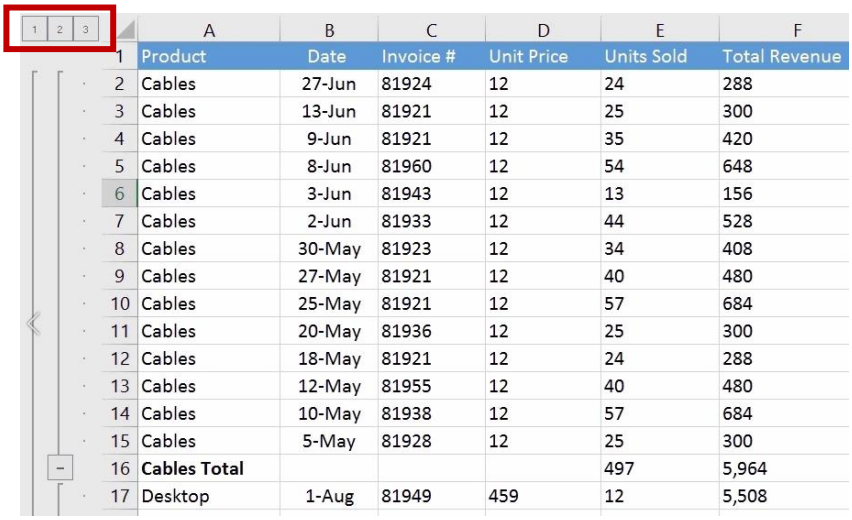
5. With the Data tab selected, click on Subtotal.



6. Under At Each Change In, keep the Product option.
7. Under Use Function, keep the SUM option.
8. Under Add subtotal to, click on Units Sold (Total Revenue should already be selected); click OK.



The list now shows totals for each store with the total for all stores at the bottom of the list. You will notice that there are **Hide Detail Level** buttons on the left:

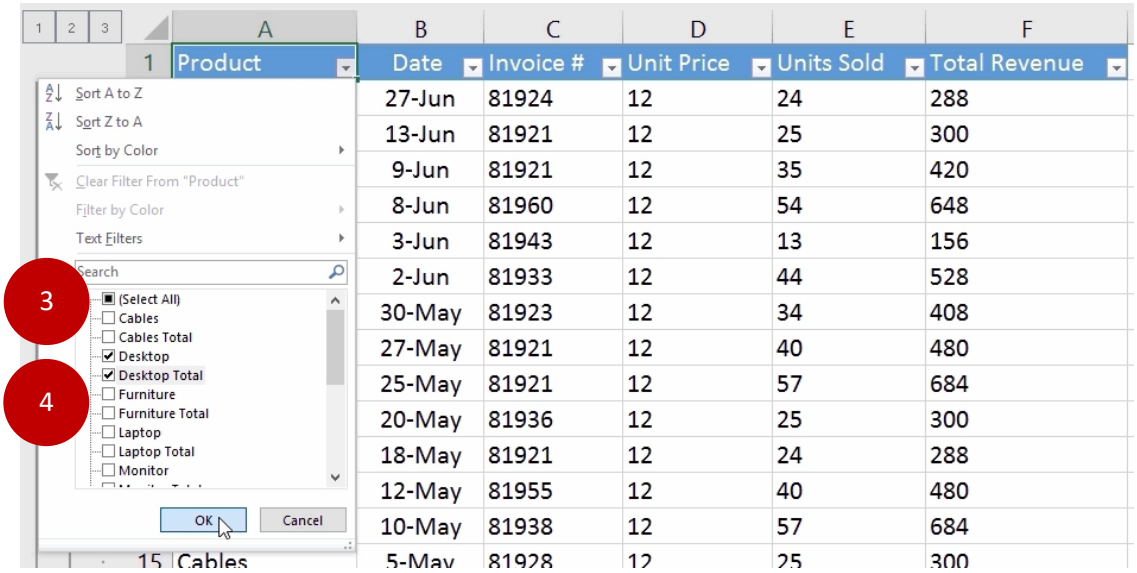


	A	B	C	D	E	F
1	Product	Date	Invoice #	Unit Price	Units Sold	Total Revenue
2	Cables	27-Jun	81924	12	24	288
3	Cables	13-Jun	81921	12	25	300
4	Cables	9-Jun	81921	12	35	420
5	Cables	8-Jun	81960	12	54	648
6	Cables	3-Jun	81943	12	13	156
7	Cables	2-Jun	81933	12	44	528
8	Cables	30-May	81923	12	34	408
9	Cables	27-May	81921	12	40	480
10	Cables	25-May	81921	12	57	684
11	Cables	20-May	81936	12	25	300
12	Cables	18-May	81921	12	24	288
13	Cables	12-May	81955	12	40	480
14	Cables	10-May	81938	12	57	684
15	Cables	5-May	81928	12	25	300
16	**Cables Total**				497	5,964
17	Desktop	1-Aug	81949	459	12	5,508

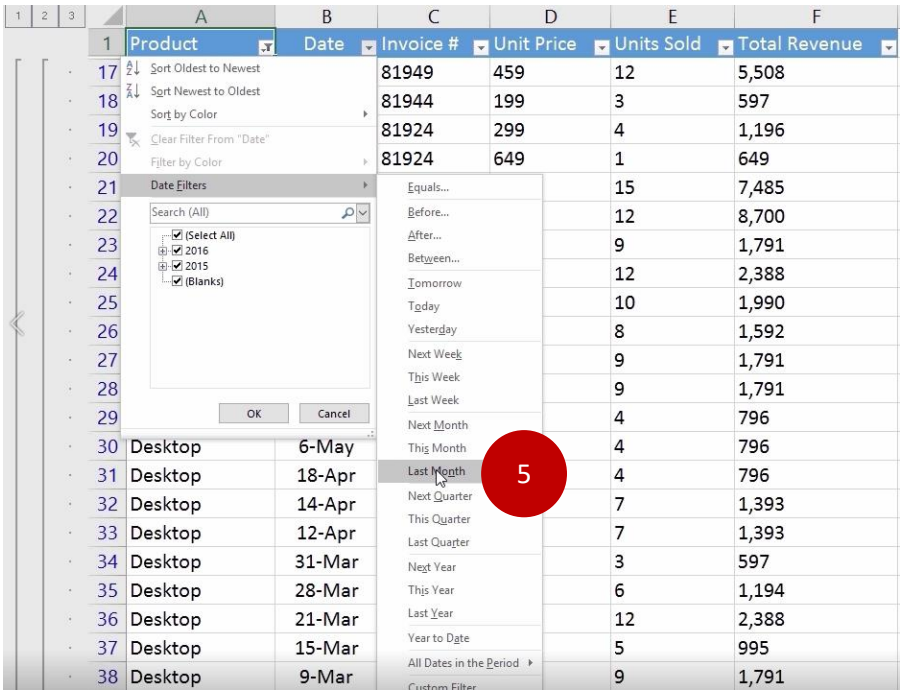
Level 1: Click to show Grand Totals
Level 2: Displays and hides Subtotals
Level 3: Displays and hides all details

Add a Filter to Subtotals

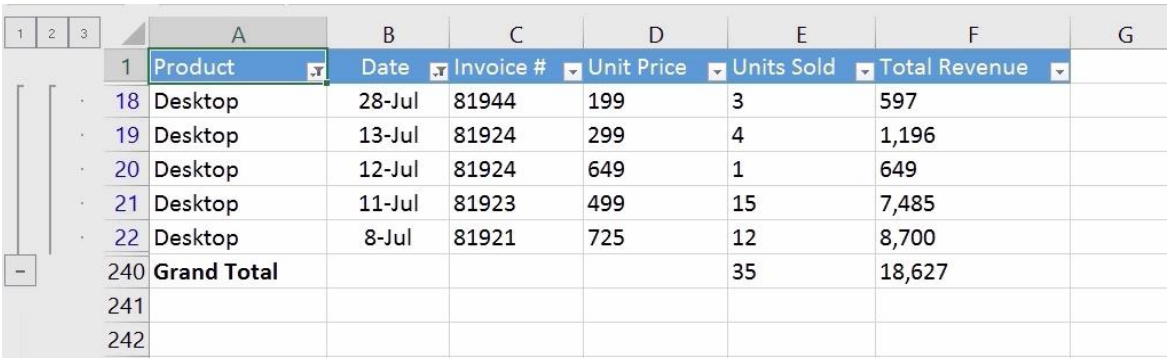
1. Click on Cell A1.
2. Go to the Data tab, click on the Filter icon.
3. Under Product, uncheck Select All.
4. Check off Desktop, Desktop Total, click OK.



5. Under Date, go to the Date filter; choose a filter, such as Between, Last Month, etc.



6. The worksheet should now look like this:



		A	B	C	D	E	F	G
1	1	Product	Date	Invoice #	Unit Price	Units Sold	Total Revenue	
18	18	Desktop	28-Jul	81944	199	3	597	
19	19	Desktop	13-Jul	81924	299	4	1,196	
20	20	Desktop	12-Jul	81924	649	1	649	
21	21	Desktop	11-Jul	81923	499	15	7,485	
22	22	Desktop	8-Jul	81921	725	12	8,700	
240	240	**Grand Total**				35	18,627	
241	241							
242	242							

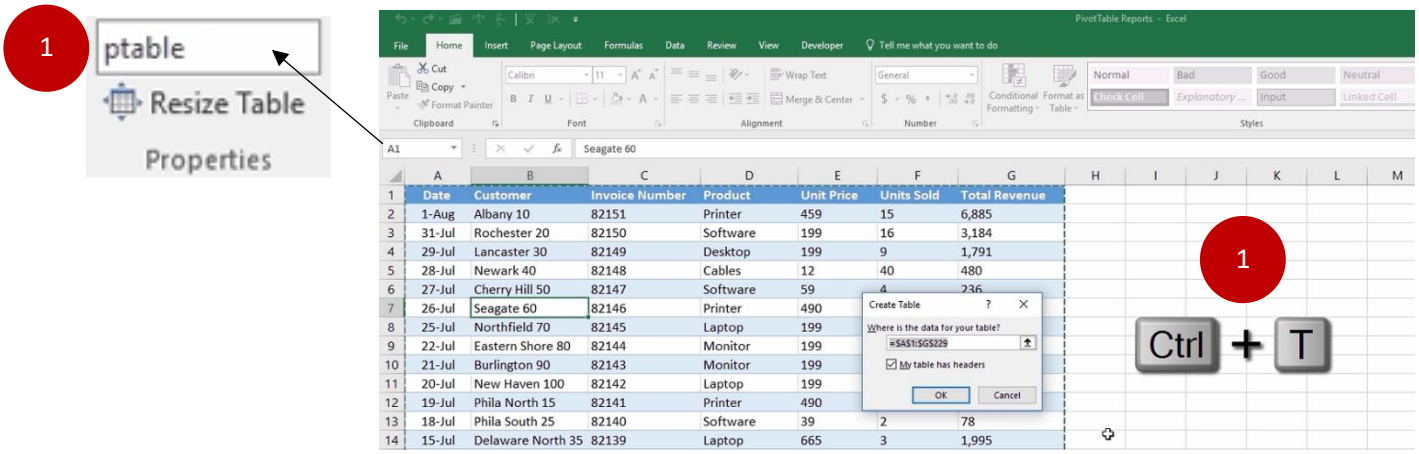
Chapter 9: Introduction to PivotTables

PivotTables are used to display complex lists of information and allow the user to control how data is organized in a worksheet. For example, a wholesale distribution company might want to keep product sales information on a list based on invoice numbers, product codes, units sold, price per unit, date sold and sales revenue totals. In addition, they may also want to associate product sales with the name of the sales person that sold the product.

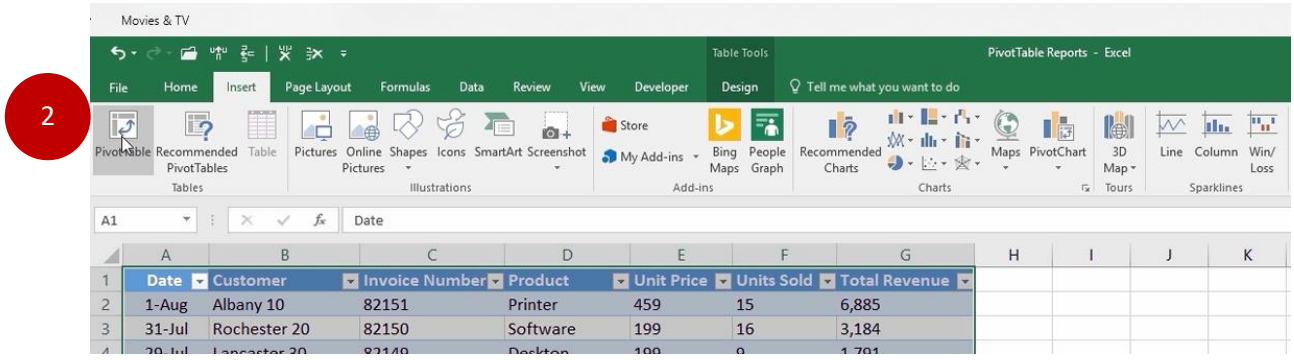
PivotTables must be linked to a data source and are read-only, meaning that you cannot make changes by typing into the cells of the Pivottable. The data source can be an Excel list, a database or another Pivot Table.

Create a simple PivotTable

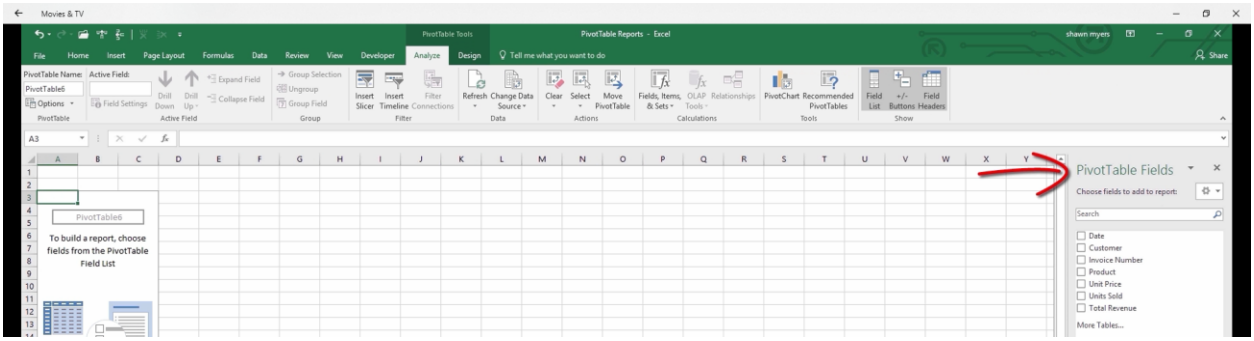
1. Click on the data, then press CTRL+T. Click on the Name Box and input a name for the Table, which in this case will be ptable.



2. Click insert and choose PivotTable:

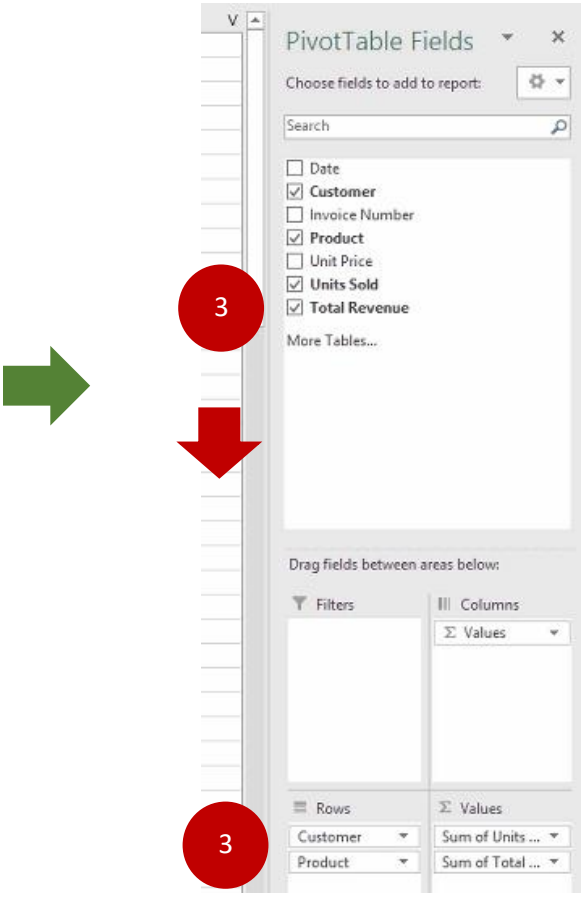


A PivotTable Field List dialog box will appear where you can see that the column labels from the data list now appear as data fields.



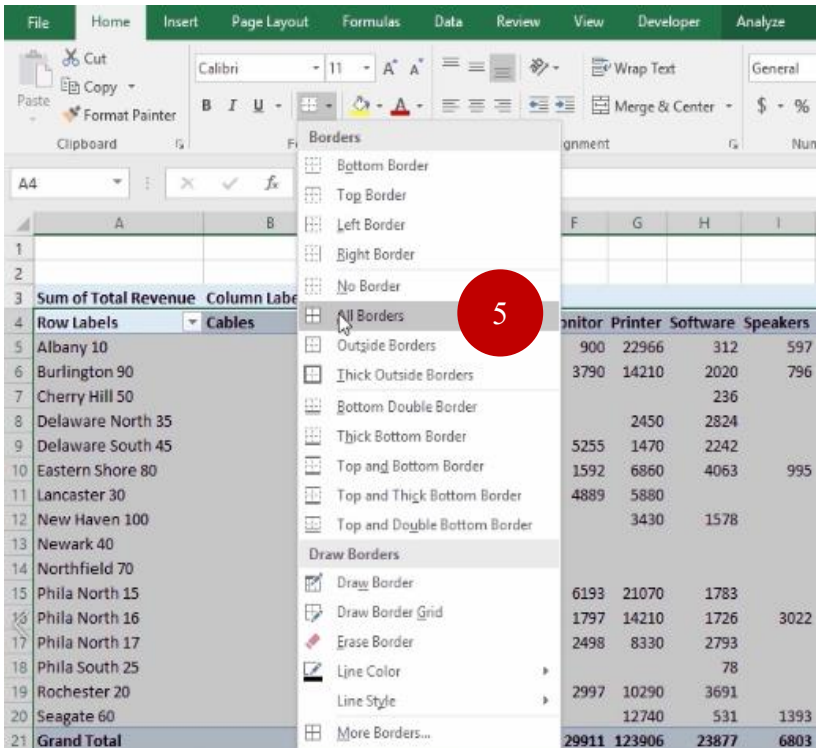
3. Add the “Customer” to the Row area, “Product” to the Row area, “Units Sold” to the Values area, and “Total Revenue” to the Values area.

Row Labels	Sum of Units Sold	Sum of Total Revenue
Albany 10		
Cables	13	156
Desktop	7	1393
Laptop	11	5451
Monitor	3	900
Printer	55	22966
Software	8	312
Speakers	3	597
Tablets	15	3769
Albany 10 Total	**115**	**35544**
Burlington 90		
Cables	34	408
Desktop	6	1194
Laptop	14	9310
Monitor	16	3790
Printer	29	14210
Software	20	2020
Speakers	4	796
Tablets	27	5313
Burlington 90 Total	**150**	**37041**
Cherry Hill 50		
Software	4	236
Cherry Hill 50 Total	**4**	**236**
Delaware North 35		
Cables	54	648
Desktop	42	8358
Laptop	28	12096
Printer	5	2450
Software	36	2824
Supply Package	13	156
Delaware North 35 Total	**178**	**26532**
Delaware South 45		

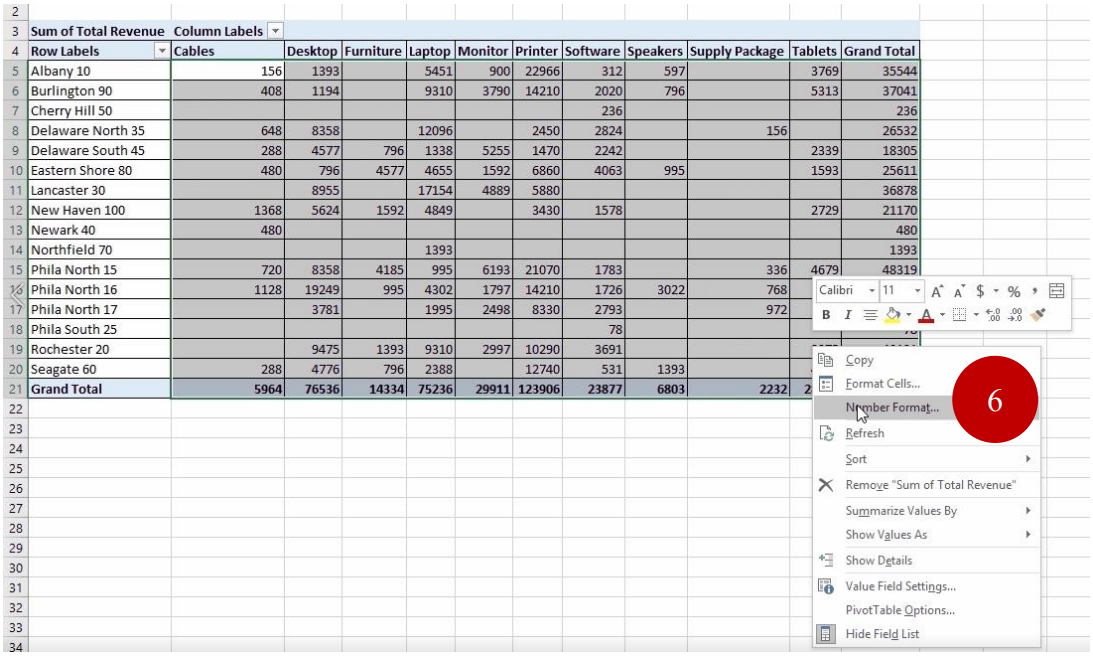


4. You could also choose to have the Products displayed in columns instead of rows. Remove the fields from PivotTable Fields, then add “Customer” to the Rows area, add “Product” to the Columns area, then add “Revenue” to the Values area.

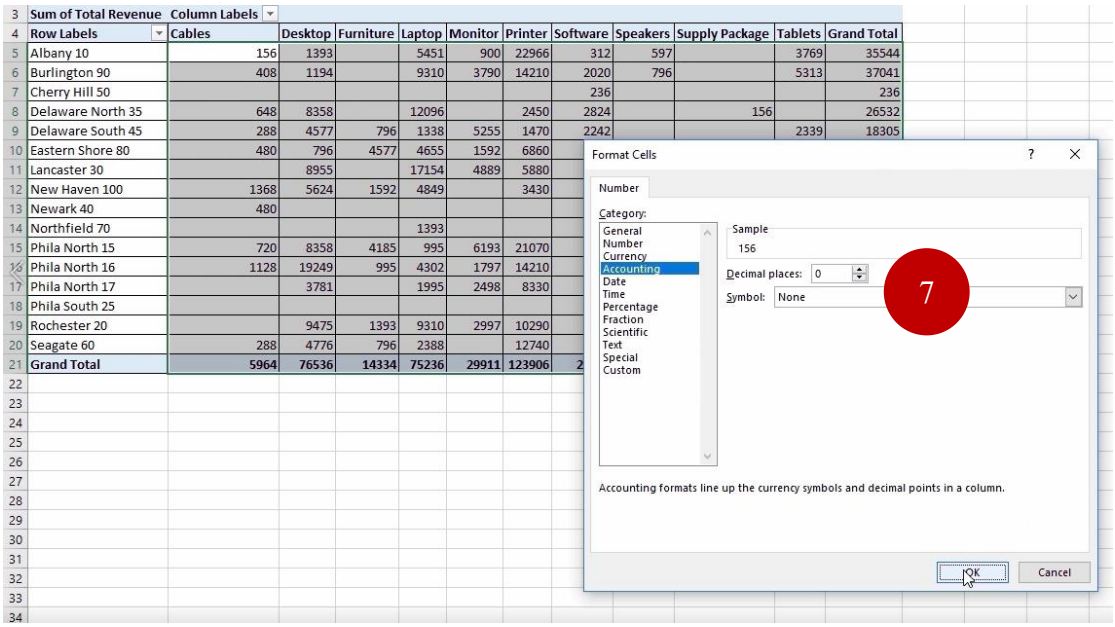
5. Add Borders to the cells by selecting them and then choosing All Borders from the Font group.



6. Change the number format by selecting all the numbers, then right click and choose Number Format.



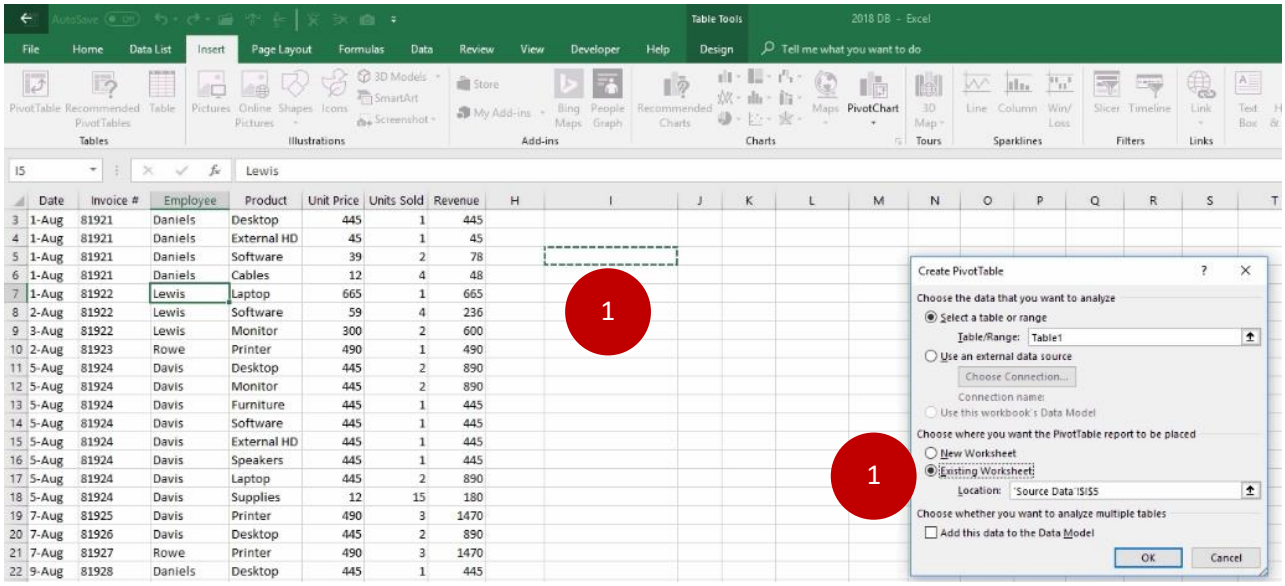
7. Choose Accounting without the dollar sign or decimal points.



Create a PivotTable Report

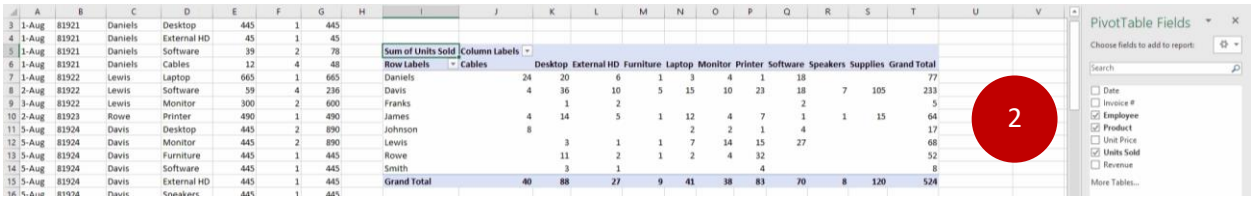
Objective: To create a summary of employee performance, based on number of units sold and the amount of revenue they generated.

1. Click on the data, click on Insert, PivotTable. Choose Existing worksheet and then click on I5; click OK.

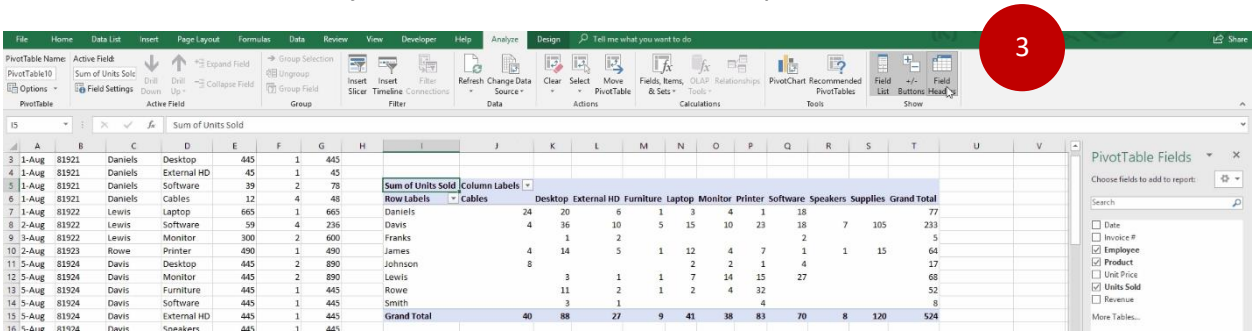


2. Add the Fields:

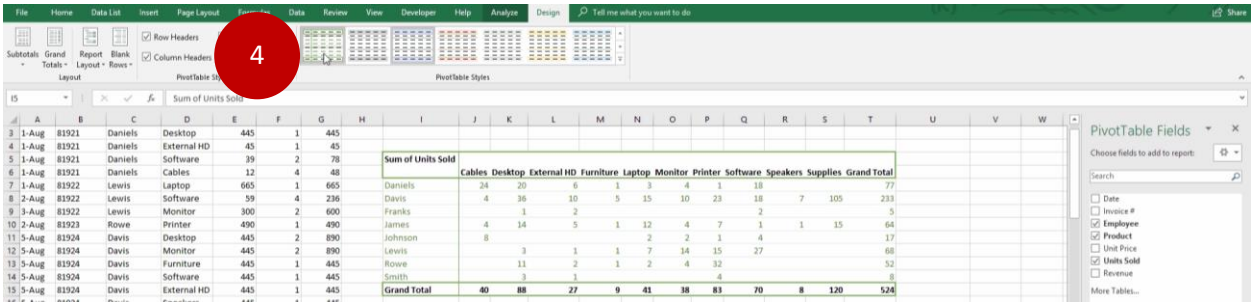
   Employee Name – Rows Area
   Product – Columns Area
   Units – Values Area



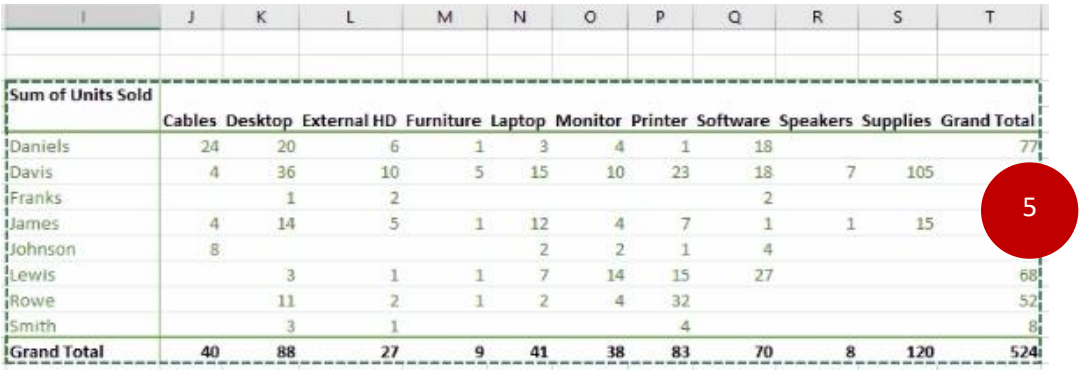
3. De-select where it says Field Headers in the Show Group.



4. Go to the Design Tab and choose Light Green style.



5. Make a copy of this PivotTable by selecting it, press CTRL+C, then press CTRL+V.



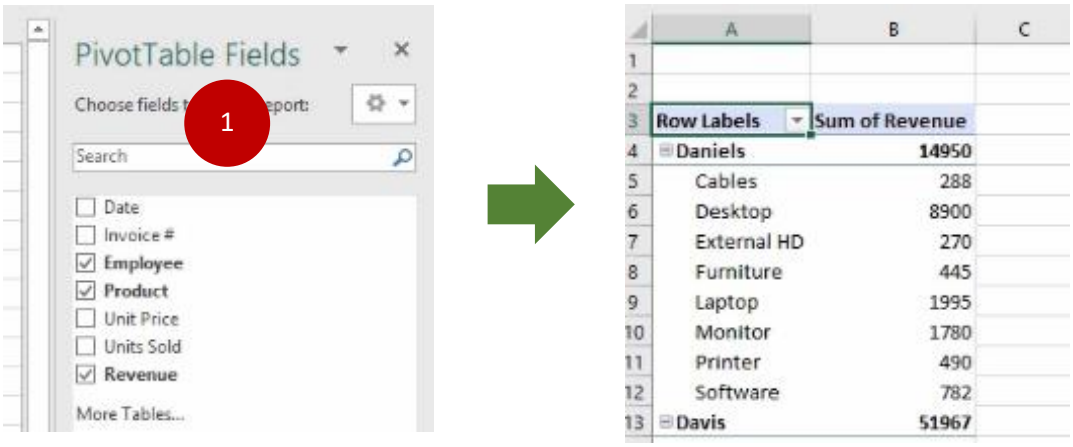
Sum of Units Sold	Cables	Desktop	External HD	Furniture	Laptop	Monitor	Printer	Software	Speakers	Supplies	Grand Total
Daniels	24	20	6	1	3	4	1	18			77
Davis	4	36	10	5	15	10	23	18	7	105	233
Franks		1	2					2			5
James	4	14	5	1	12	4	7	1	1	15	64
Johnson	8				2	2	1	4			17
Lewis		3	1	1	7	14	15	27			68
Rowe		11	2	1	2	4	32				52
Smith		3	1				4				8
Grand Total	40	88	27	9	41	38	83	70	8	120	524

6. We want the second PivotTable to show us the amount of revenue generated by each employee, so press the Esc key to de-select the first PivotTable, click anywhere inside the second PivotTable, un-check Units Sold, and check off Revenue.

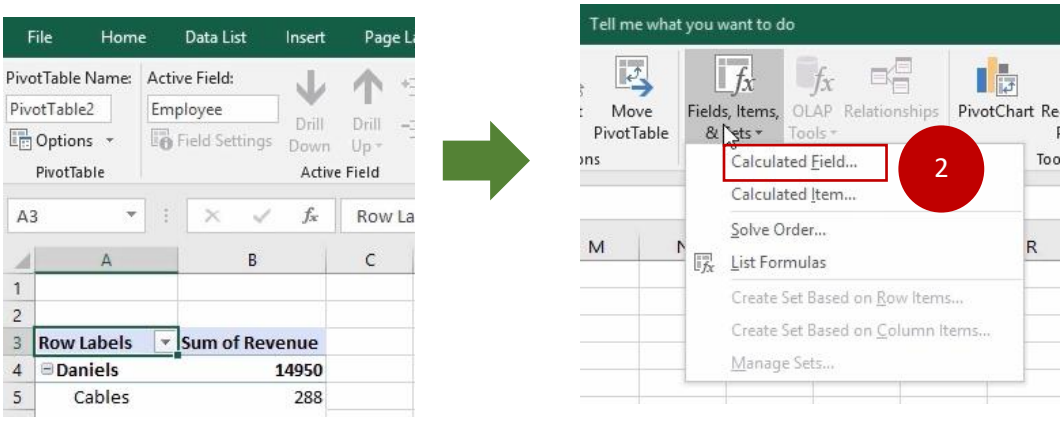
Calculated Fields

Objective: Calculate a 7% commission payout for the salespeople.

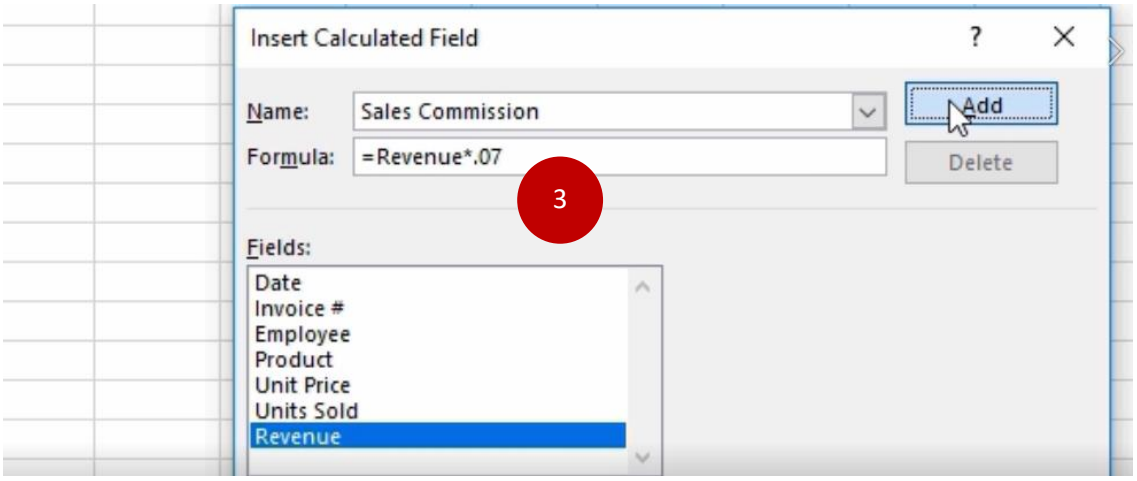
1. Input the following Fields; Employee to the Rows area, Product Name to the Rows Area and Revenue to the Values Area.



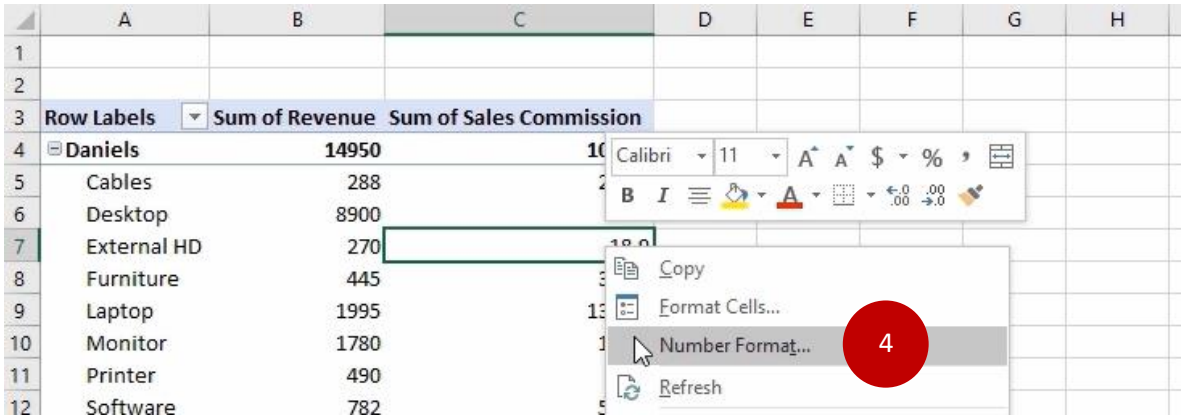
2. Click on the Analyze tab, then Calculations group; choose Fields, Items and Sets, Calculated Field:



3. Enter Sales Commission in the Name Field; **press the Tab key.** Enter =Revenue*.07. Click Add, then click OK.



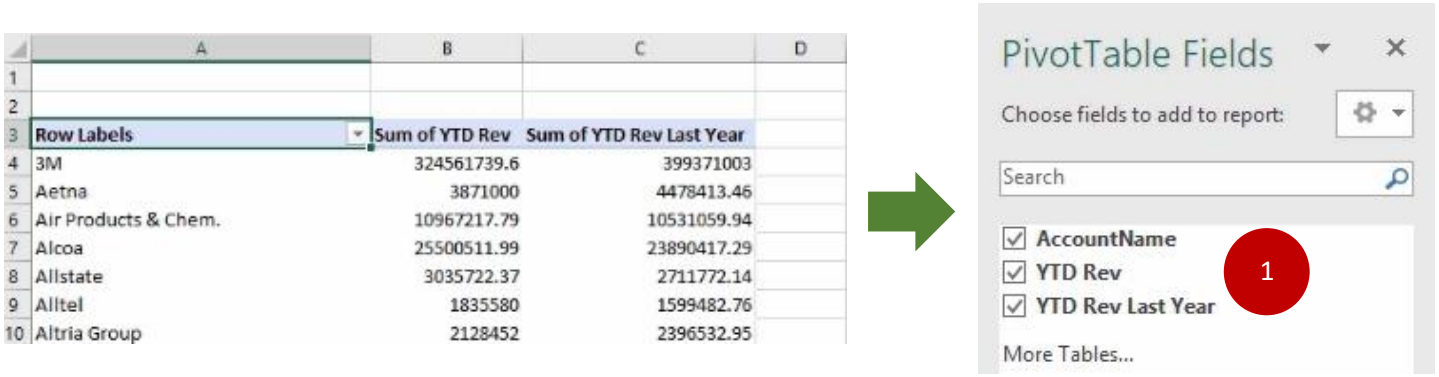
4. Let's change the Number Format to Accounting with two decimal places and change the Revenue numbers to Accounting with no decimal places.



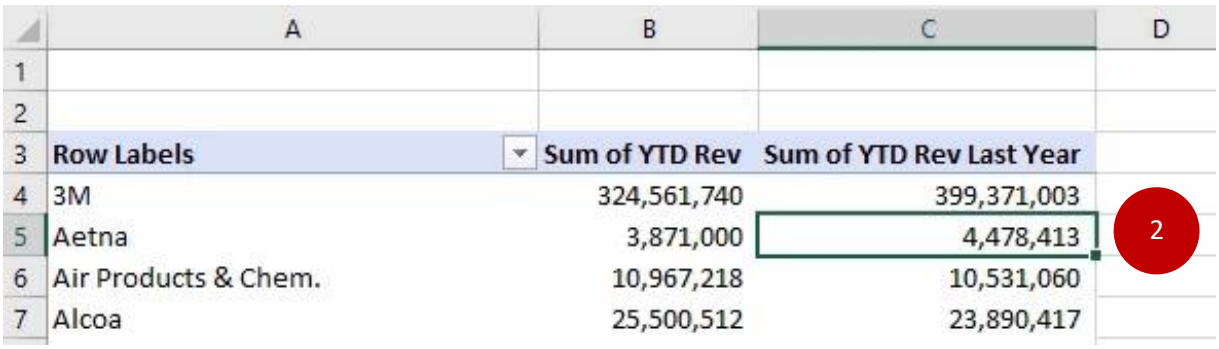
Calculated Field Report (second example)

Objective: Calculate the variance between two time periods.

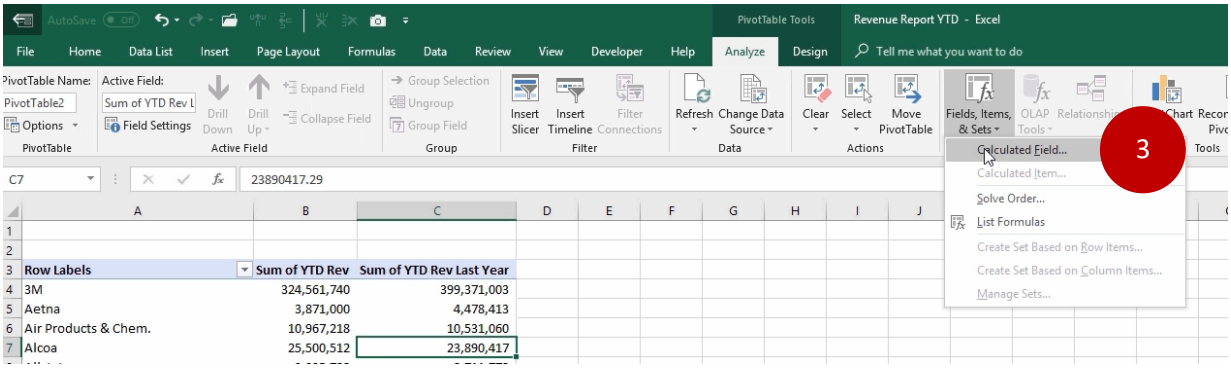
1. Open the file and check off all three Fields.



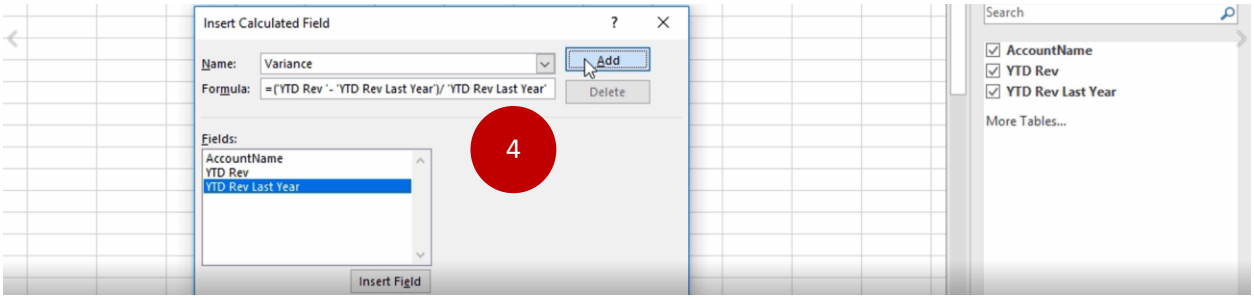
2. Change the Number Formats in columns B and C to Accounting with no decimal points.



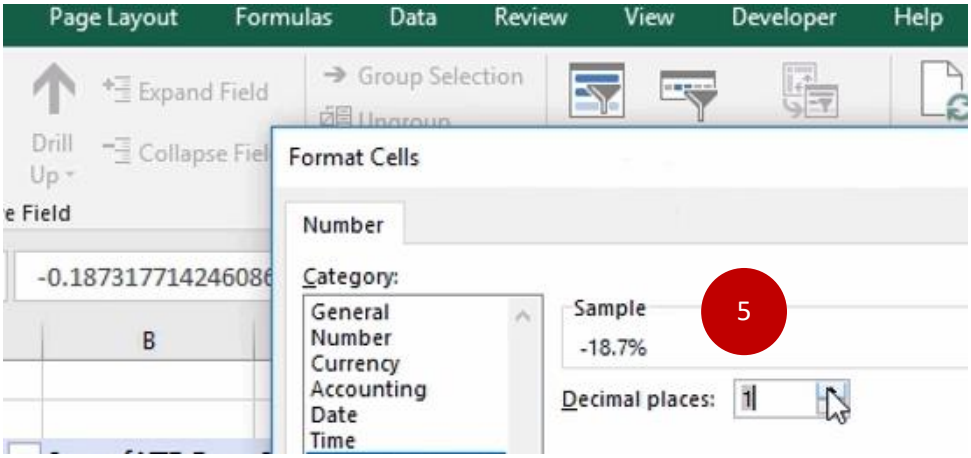
3. Go to Fields, Items and Sets, then go to Calculated Field.



4. Add the formula in the spaces inside the dialog box, then click OK.



5. Format all the dollar figures to Accounting with one decimal point without dollar signs.



Calculated Items

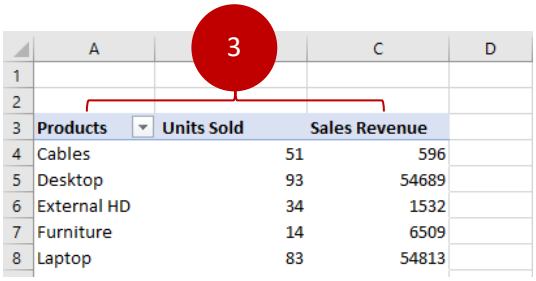
Objective: Create new Fields (Computer, Hardware and Printers) that display the total number of units sold and revenue of four items (Desktops, Laptops, Monitors and Printers).

1. Insert a PivotTable, then add the Fields:

   Product Name – Rows area
   Units Sold – Values area
   Revenue – Values area

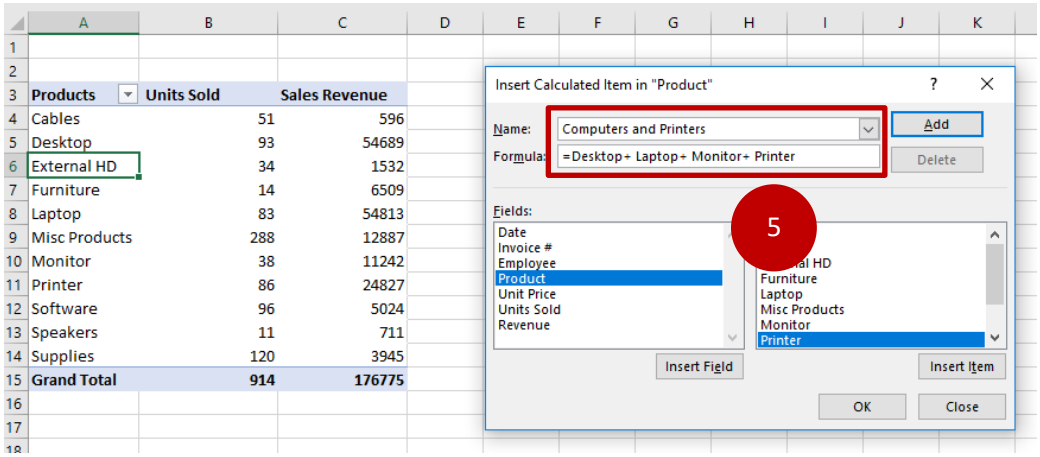
2. Change the numbers in the Revenue Field to Accounting without dollar signs or decimal points.

3. Change the column labels to Products, Units Sold and Sales Revenue. For the Units Sold label, you need to insert a space before the word Units, so that you can avoid getting a message that says, “PivotTable field name already exists”.

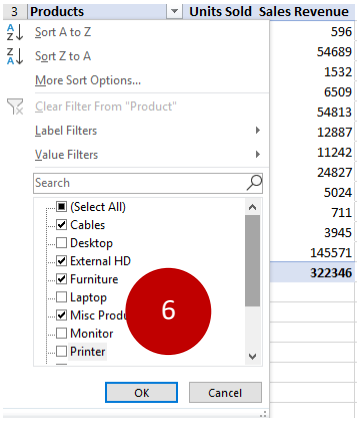


4. Click on any cell in Column A. Under PivotTable Tools, click on the Fields, Items and Sets drop-down arrow in the Calculate group. Choose Calculated Item.

5. Under Name, type “Computers and Printers”. Click on the space next to Formula. With “Product” selected under Fields, double-click on Desktop, add a plus sign, double-click on Laptop, add a plus sign, double-click on Monitor, add a plus sign, then double-click on Printer; click OK:



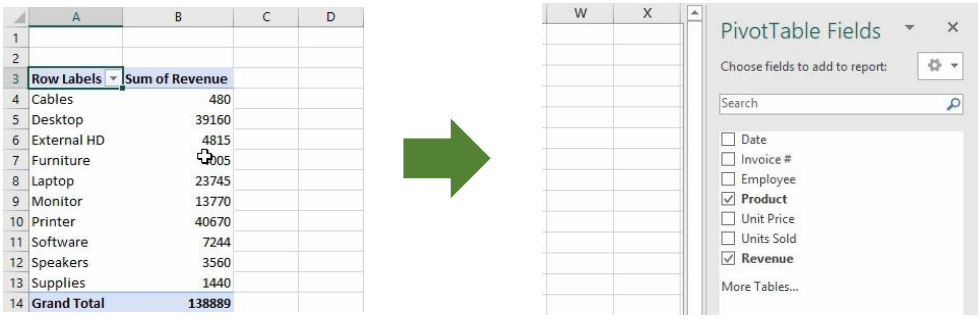
6. Click on the Product filter icon. Uncheck the Desktop, Laptop Monitor and Printer Fields, since the Units Sold and Revenue numbers corresponding to those Fields are also in the Computer and Printers Field; click OK.



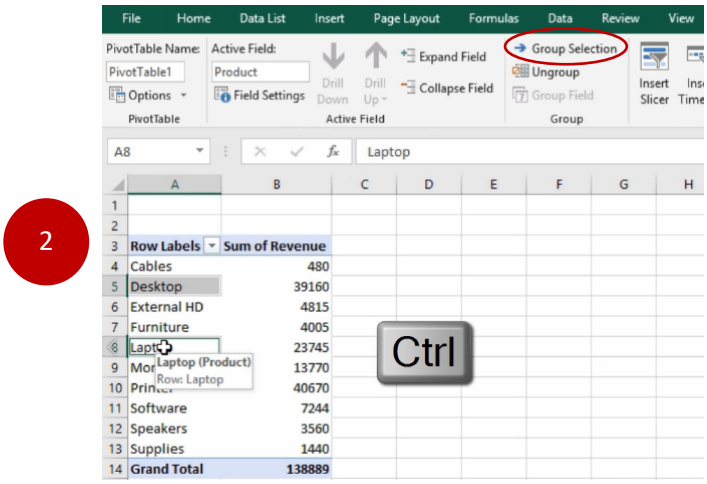
Organize Data into Groups

Objective 1: Organize the product names into groups.

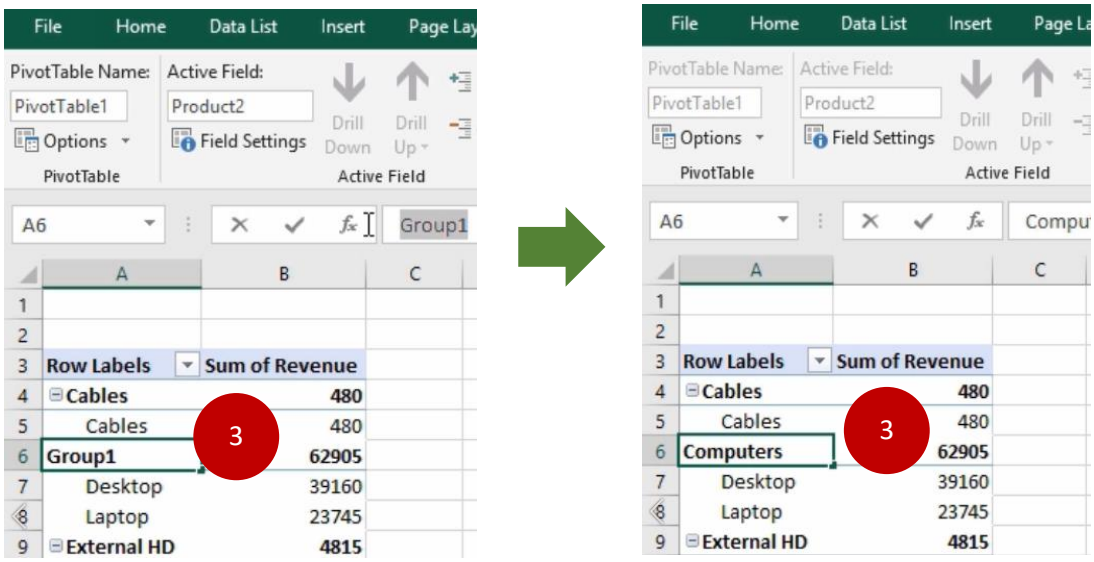
1. Insert a PivotTable. Check off Product and Revenue under PivotTable Field Names.



2. Click on Desktop, hold down the CTRL key and click on the PivotTable; then click on Group Selection.



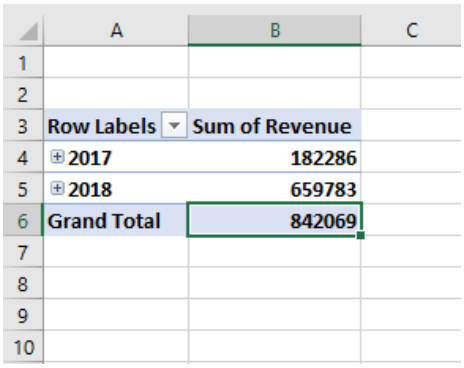
3. Click on Group1 and change the name to “Computers”.



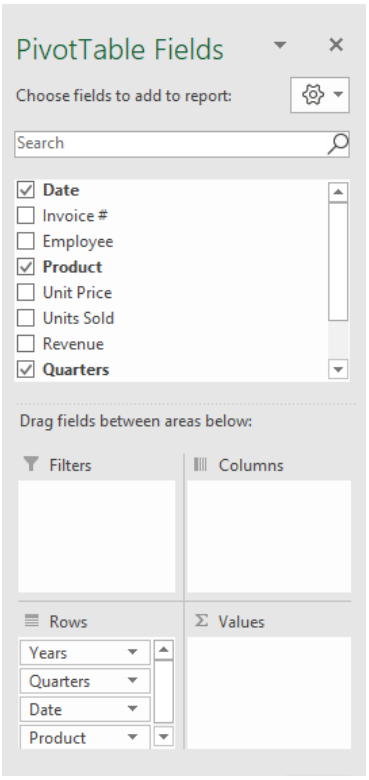
4. Select Monitor, hold down the CTRL key and choose Printers; name the group “Peripherals”. Repeat these steps for the other products and name the group “Other”.

Objective two: Organize data by date.

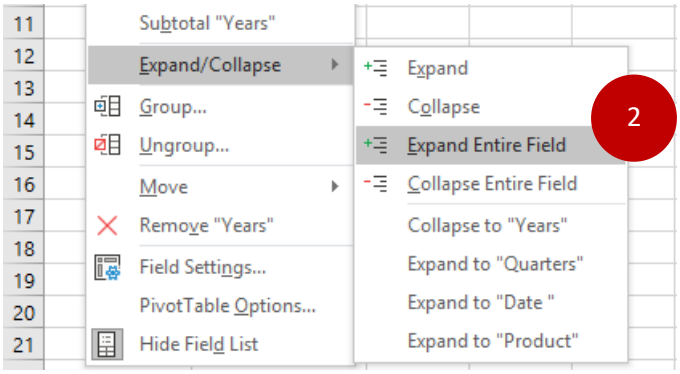
1. Insert a PivotTable; check off Date, Product and Revenue. You'll notice that the Date Field is displayed as Years and Quarters.



Row Labels	Sum of Revenue
2017	182286
2018	659783
Grand Total	842069



2. Right-click on Qtr1, then go to Expand/Collapse. Choose Expand Entire Field. Click on the PivotTable, then click on the Design tab. Change the PivotTable format by selecting different style and layout options.

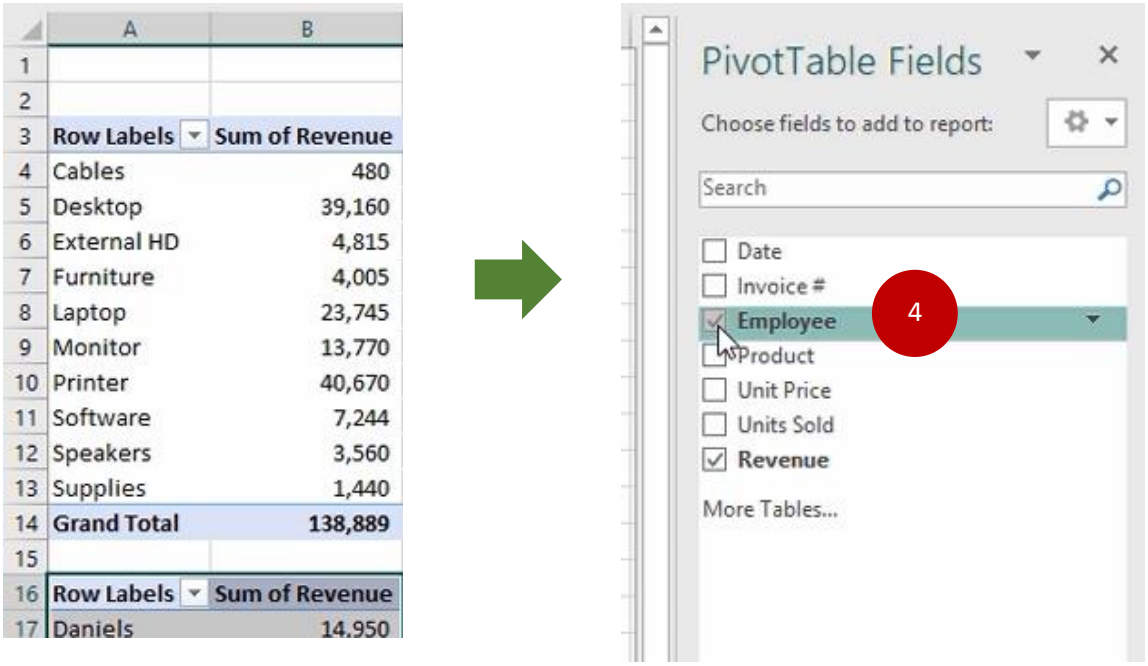


Dates	Revenue Totals
2017	182,286
Qtr1	76,527
Qtr2	52,330
Qtr3	29,337
Qtr4	24,092
2018	659,783
Qtr1	280,361
Qtr2	133,402
Qtr3	158,062
Qtr4	87,958
Grand Total	842,069

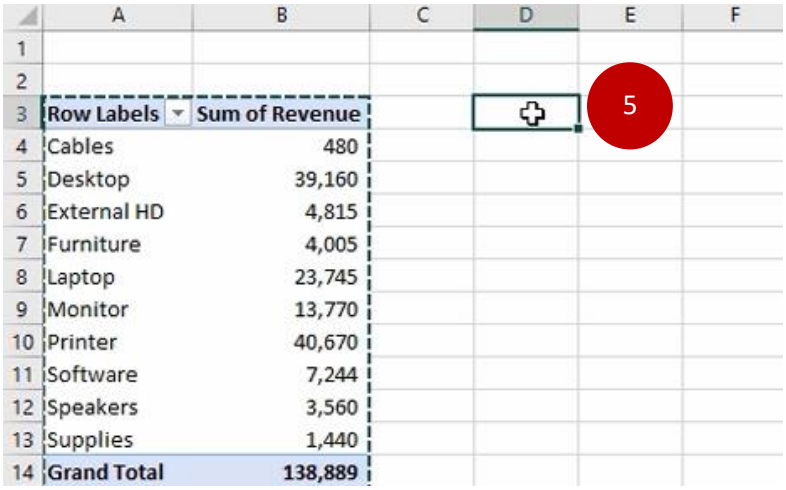
Percent of Total

Objective: To display product and employee numbers as a percentage of total revenue.

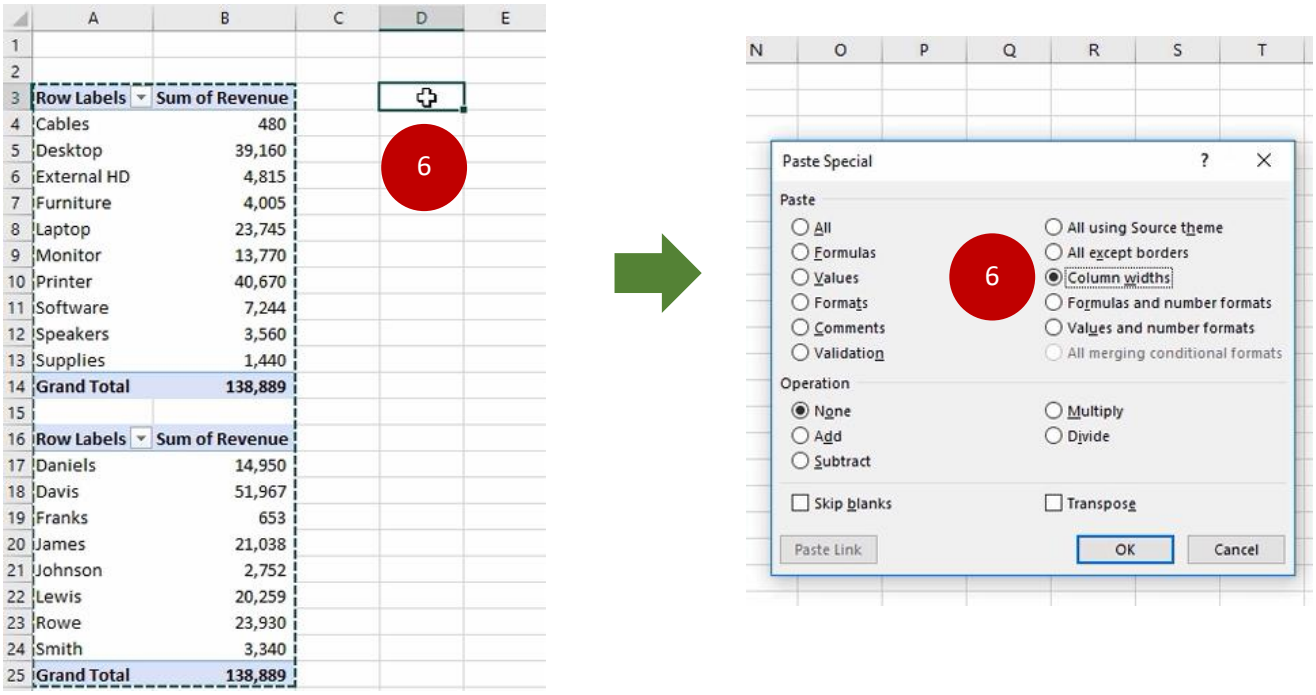
1. With the PivotTable selected, move Product to the Rows area and Revenue to the Values area.
2. Change the Number Format to Accounting without decimal points.
3. Make a copy of the PivotTable by selecting it, press CTRL+C, click on the cell just beneath it; press CTRL+V.
4. Press the Esc key; with the second PivotTable selected, uncheck Product and check off Employee.



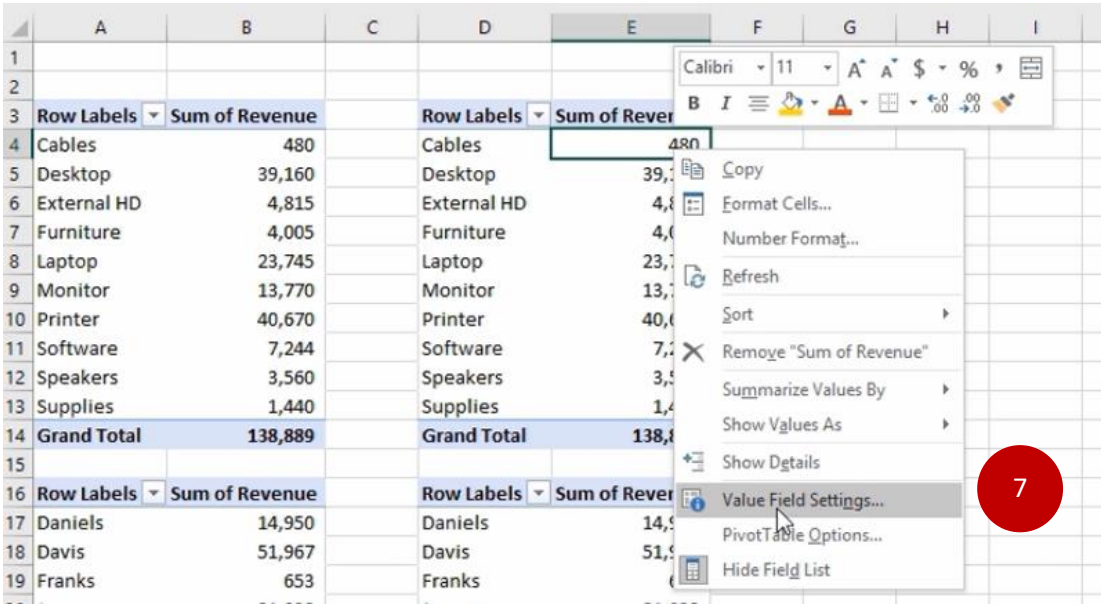
5. Select both PivotTables, press CTRL+C, click on cell D3, then press CTRL+ALT+V.



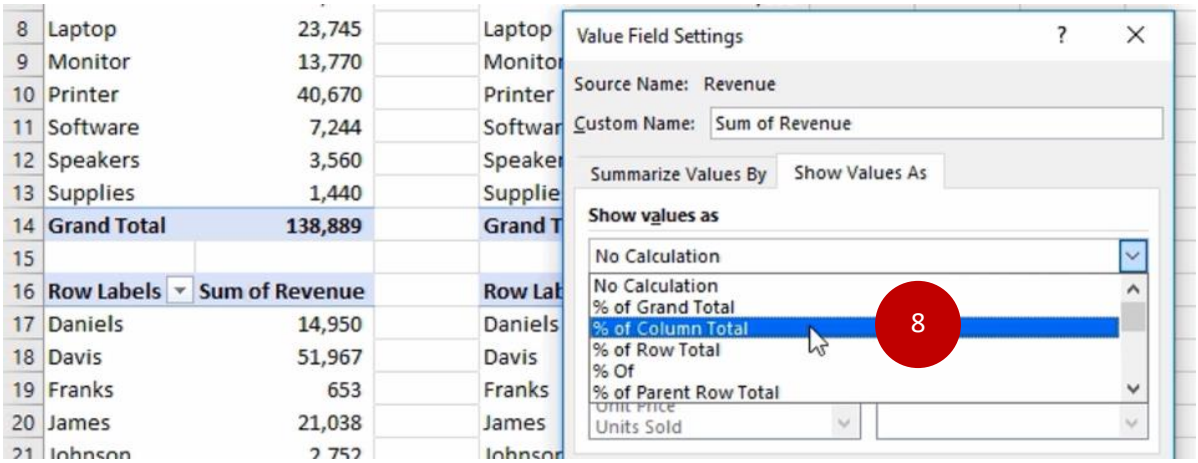
6. Use the up arrow on your keyboard in the PivotTable dialog box to select Column Widths; click OK, then press the Enter key.



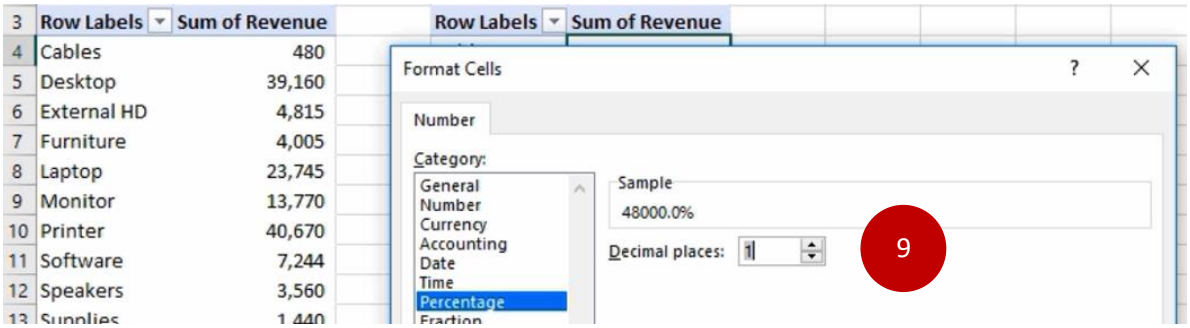
7. Right-click on the first revenue number; choose Value Field Settings.



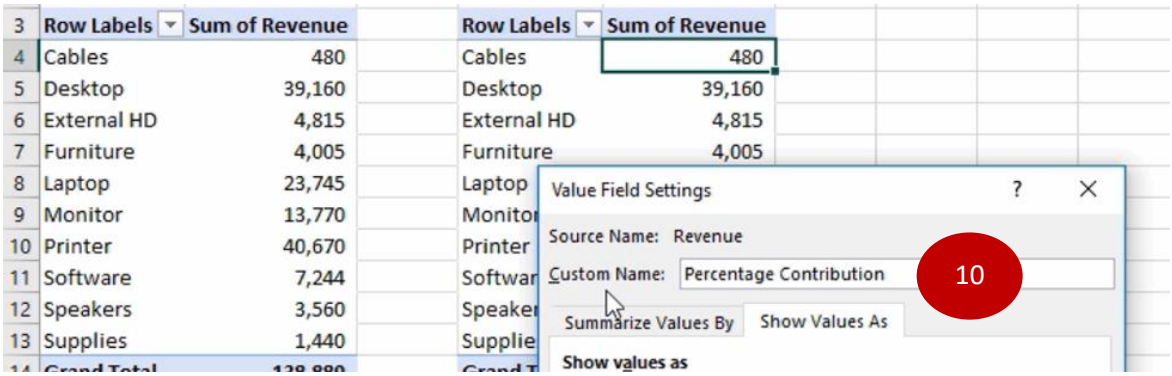
8. Under the Show Values As tab, choose % of Column Total; then click on the Number Format button.



9. Choose Percentage with one decimal place; click OK.



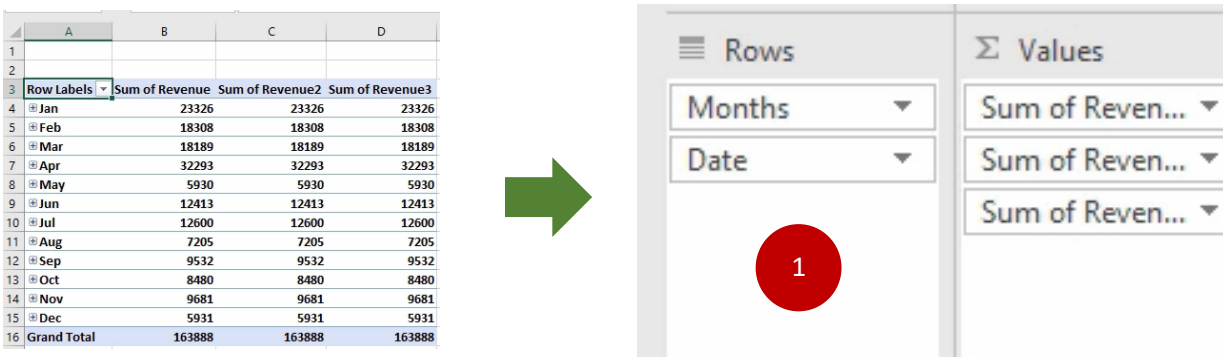
10. Under Custom Name, type Percentage Contribution; click OK.



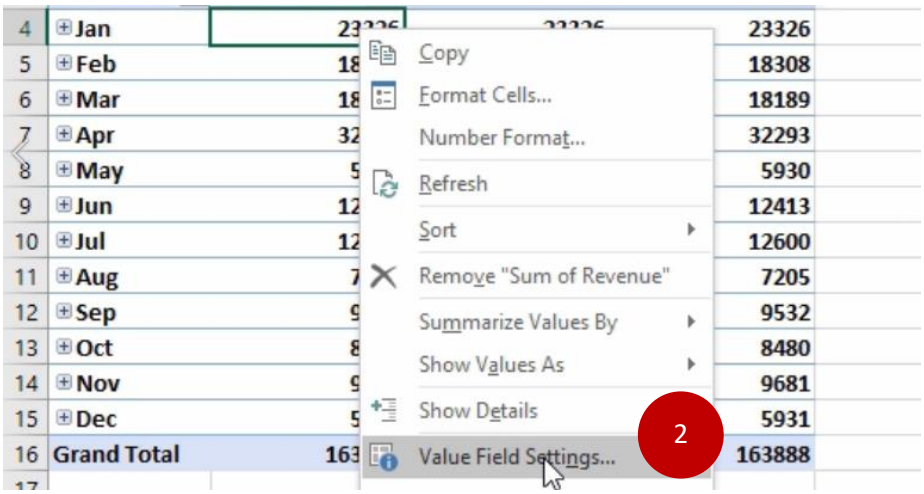
Multiple Value Calculations

Objective: To display the total, average and highest sales revenue numbers for each month

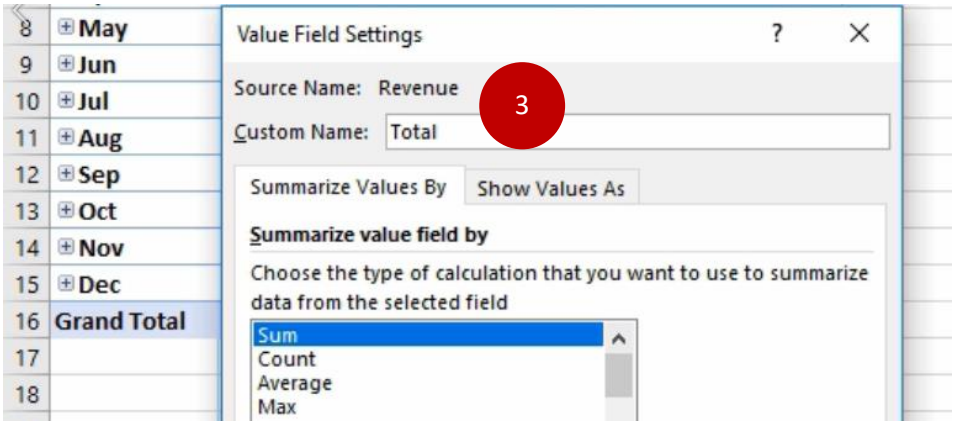
1. Click on the PivotTable. Move the Date to the Rows Area, then move Revenue to the Values area **three times:**



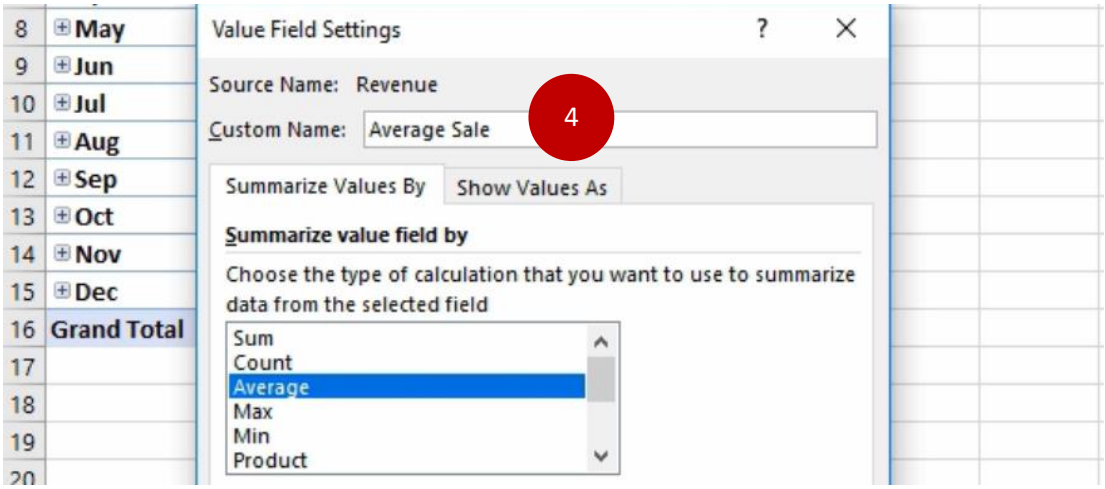
2. Click on first Revenue value; right-click and choose Value Field Setting.



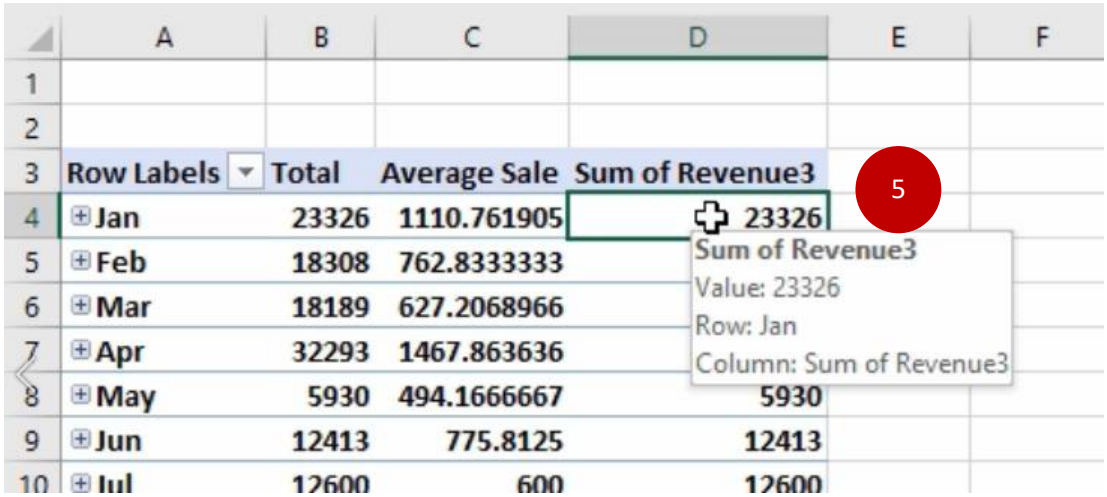
3. Input the word “Total” in Custom Name, click OK.



4. Click on the second Revenue value; right click and choose Value Field Setting. Click on Average under Summarize value field by **first;** then rename it Average Sale in Custom Name.

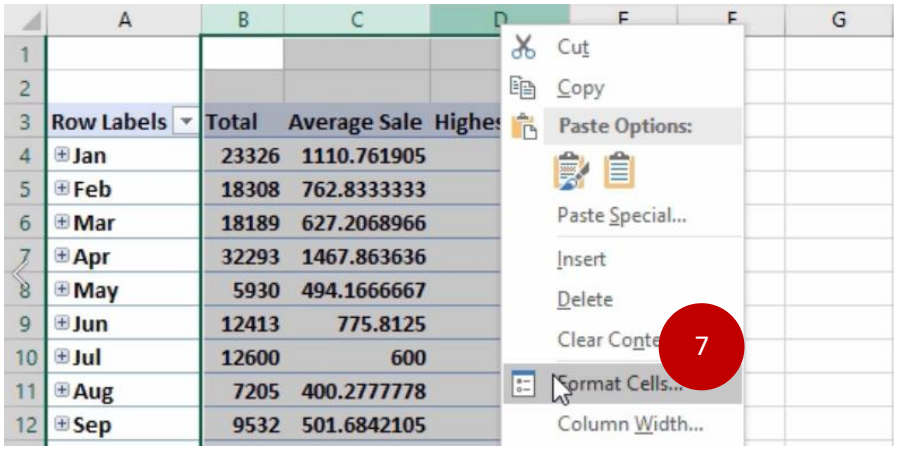


5. Click on third Revenue value; right click and choose Value Field Setting.

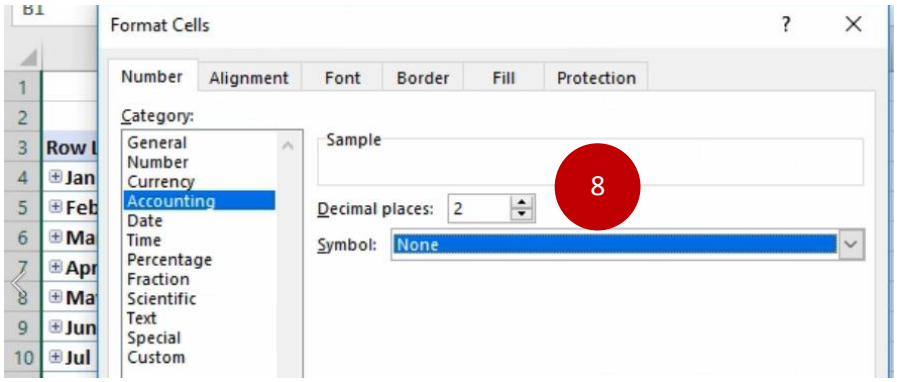


6. Repeat steps to choose Max; rename it Highest Sale, then click OK.

7. Select columns B through D; right-click and choose Format Cells.



8. Choose Accounting with two decimal places; click OK.



The PivotTable should now look like this:

Row Labels	Total	Average Sale	Highest Sale
Jan	23,326.00	1,110.76	11,475.00
Feb	18,308.00	762.83	3,028.00
Mar	18,189.00	627.21	2,325.00
Apr	32,293.00	1,467.86	16,625.00
May	5,930.00	494.17	1,304.00
Jun	12,413.00	775.81	1,976.00
Jul	12,600.00	600.00	1,510.00
Aug	7,205.00	400.28	1,310.00
Sep	9,532.00	501.68	1,330.00
Oct	8,480.00	530.00	1,396.00
Nov	9,681.00	605.06	2,672.00
Dec	5,931.00	395.40	1,318.00
Grand Total	163,888.00	715.67	16,625.00

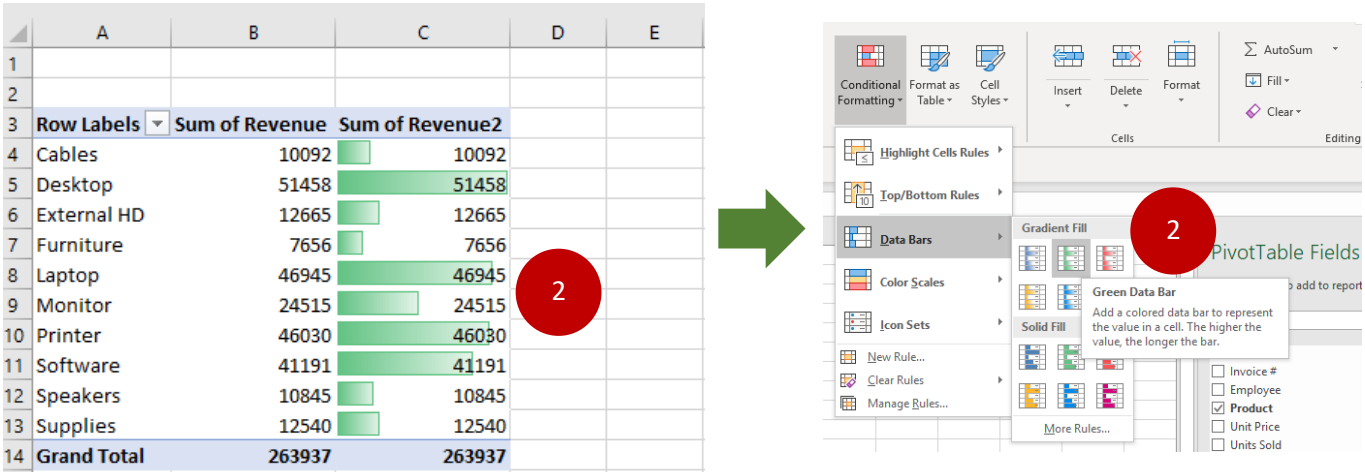
Apply Conditional Formatting

Objective: To create a visual that show a comparison between individual product sales revenue and total sales revenue.

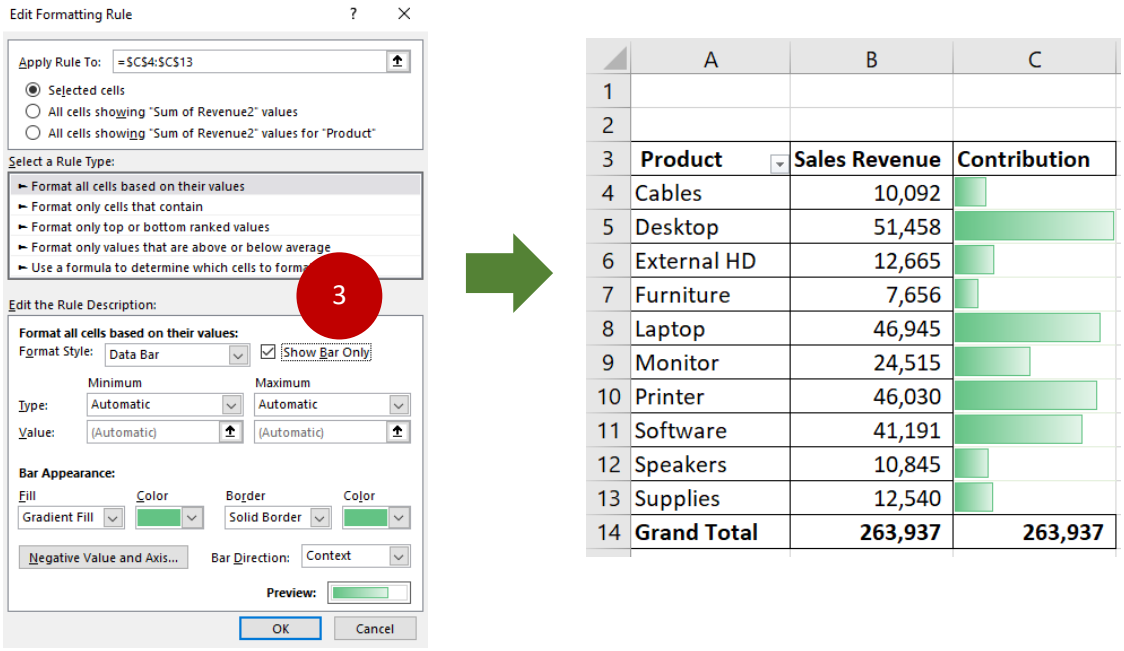
1. Insert a PivotTable, then add these Fields:

   Product Name – Rows area
   Revenue – Values area
   Revenue – Values area (again)

2. Select cells C4 to C13. Click on the Home tab, then click on the Conditional Formatting down arrow and choose Data Bars, Green Data Bar, Gradient Fill.



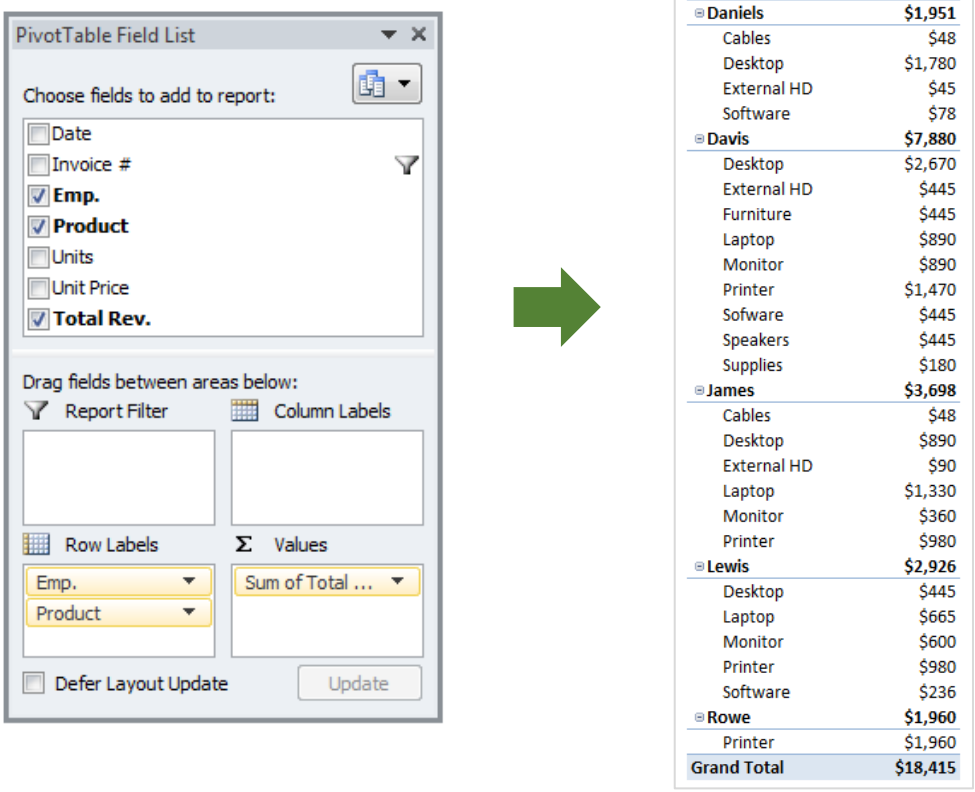
3. With the cells in column C still selected (cells C4 to C13), click on the Conditional Formatting down arrow, click on Manage Rules, then Edit Rule. Check off where is says Show Bar Only, then click OK. Change the style, column labels and number formatting:



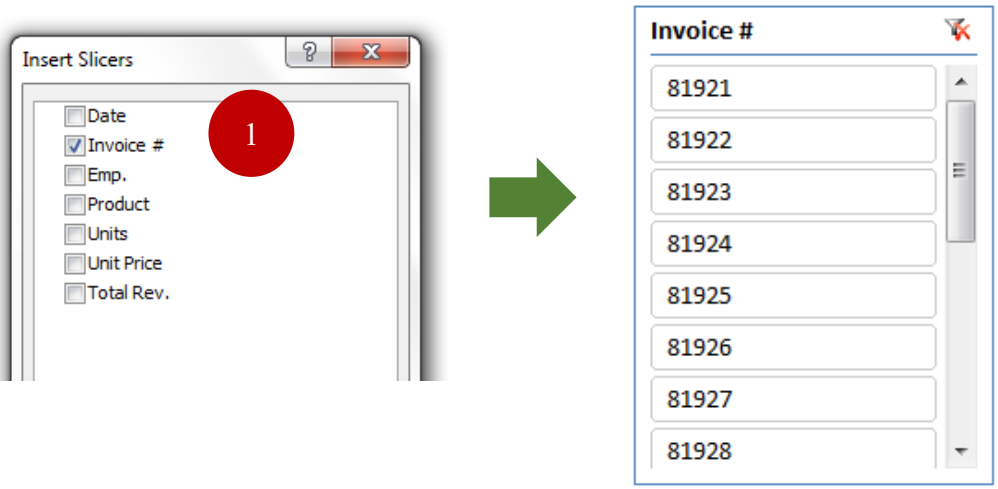
Inserting Slicers

Objective: To filter data in one or more PivotTables.

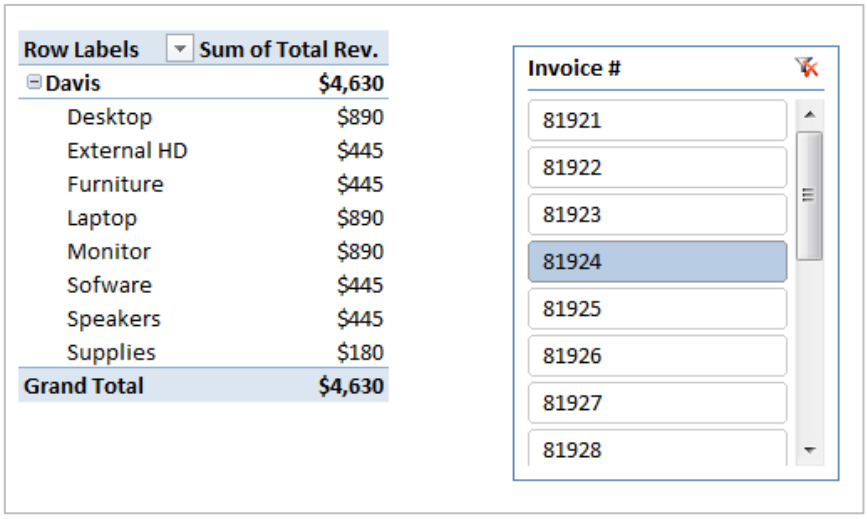
Slicers allow users to filter data in a PivotTable by clicking on buttons instead of using a drop-down list. The numbers in this PivotTable lists the same invoice number for multiple items that were purchased and recorded in a sales log. A PivotTable was created so that Slicers can be used to view the employee name, products and dollar amounts, by invoice number.



1. Click on the PivotTable, then choose the Slicer button from the Filter group. Choose the Invoice # checkbox, click OK. The Slicer options will appear; check the box for Invoice #, click OK:



When you click on invoice # 81924, for example, the employee that created the invoice will appear. The PivotTable will now only display the products and revenue numbers associated with that number. Later versions of Excel will also have a button called Multi-Select next to the Filter icon, which allows you to select multiple invoices.

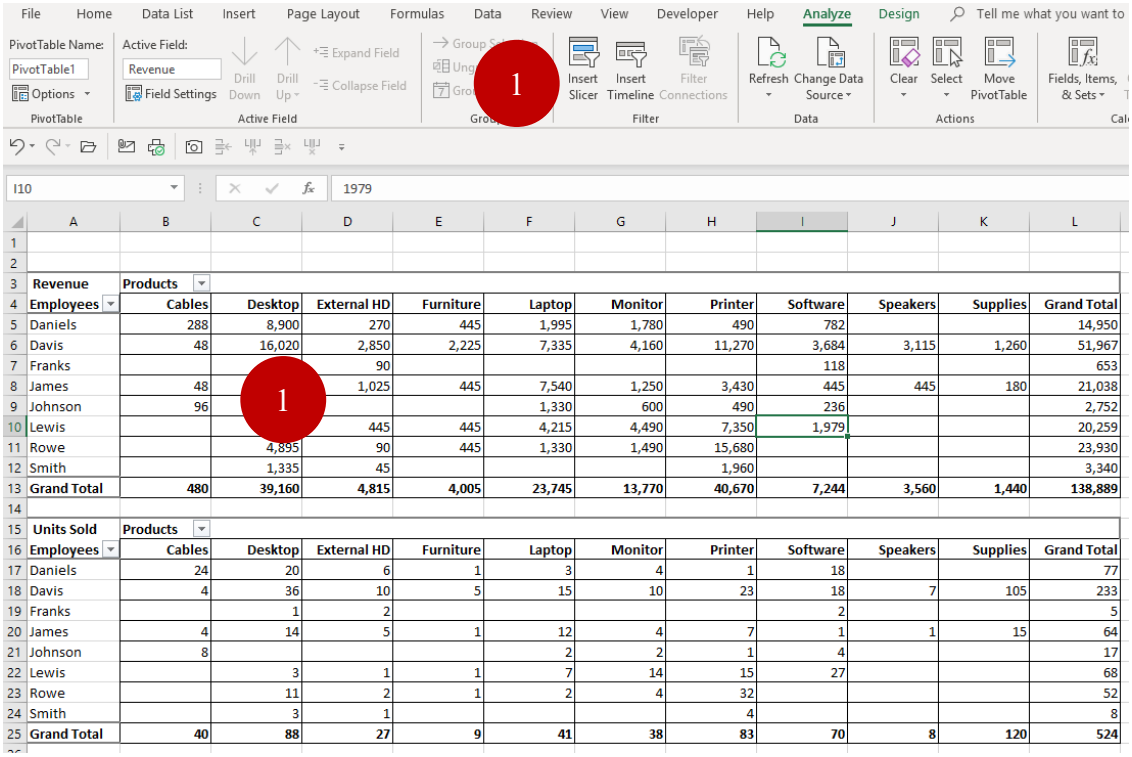


Row Labels	Sum of Total Rev.
Davis	$4,630
Desktop	$890
External HD	$445
Furniture	$445
Laptop	$890
Monitor	$890
Sofware	$445
Speakers	$445
Supplies	$180
Grand Total	$4,630

Slicer Connections

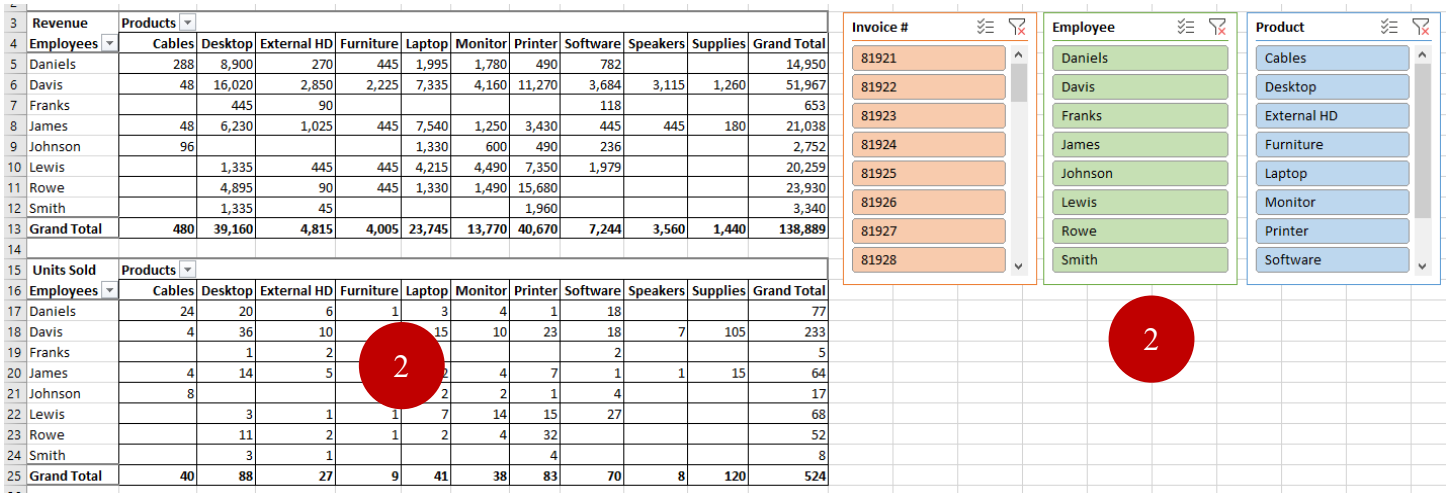
When you have more than one PivotTable on a single worksheet, you can create Slicers that display the filtered data on all of them at the same time using Slicer Connections.

1. Click on the first PivotTable, then click on Insert Slicers from the Analyze group. Check off Invoice number, Employee and Product.



	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3	Revenue	Products										
4	Employees	Cables	Desktop	External HD	Furniture	Laptop	Monitor	Printer	Software	Speakers	Supplies	Grand Total
5	Daniels	288	8,900	270	445	1,995	1,780	490	782			14,950
6	Davis	48	16,020	2,850	2,225	7,335	4,160	11,270	3,684	3,115	1,260	51,967
7	Franks			90					118			653
8	James	48		1,025	445	7,540	1,250	3,430	445	445	180	21,038
9	Johnson	96				1,330	600	490	236			2,752
10	Lewis			445	445	4,215	4,490	7,350	1,979			20,259
11	Rowe		4,895	90	445	1,330	1,490	15,680				23,930
12	Smith		1,335	45				1,960				3,340
13	Grand Total	480	39,160	4,815	4,005	23,745	13,770	40,670	7,244	3,560	1,440	138,889
14												
15	Units Sold	Products										
16	Employees	Cables	Desktop	External HD	Furniture	Laptop	Monitor	Printer	Software	Speakers	Supplies	Grand Total
17	Daniels	24	20	6	1	3	4	1	18			77
18	Davis	4	36	10	5	15	10	23	18	7	105	233
19	Franks		1	2					2			5
20	James	4	14	5	1	12	4	7	1	1	15	64
21	Johnson	8				2	2	1	4			17
22	Lewis		3	1	1	7	14	15	27			68
23	Rowe		11	2	1	2	4	32				52
24	Smith		3	1				4				8
25	Grand Total	40	88	27	9	41	38	83	70	8	120	524

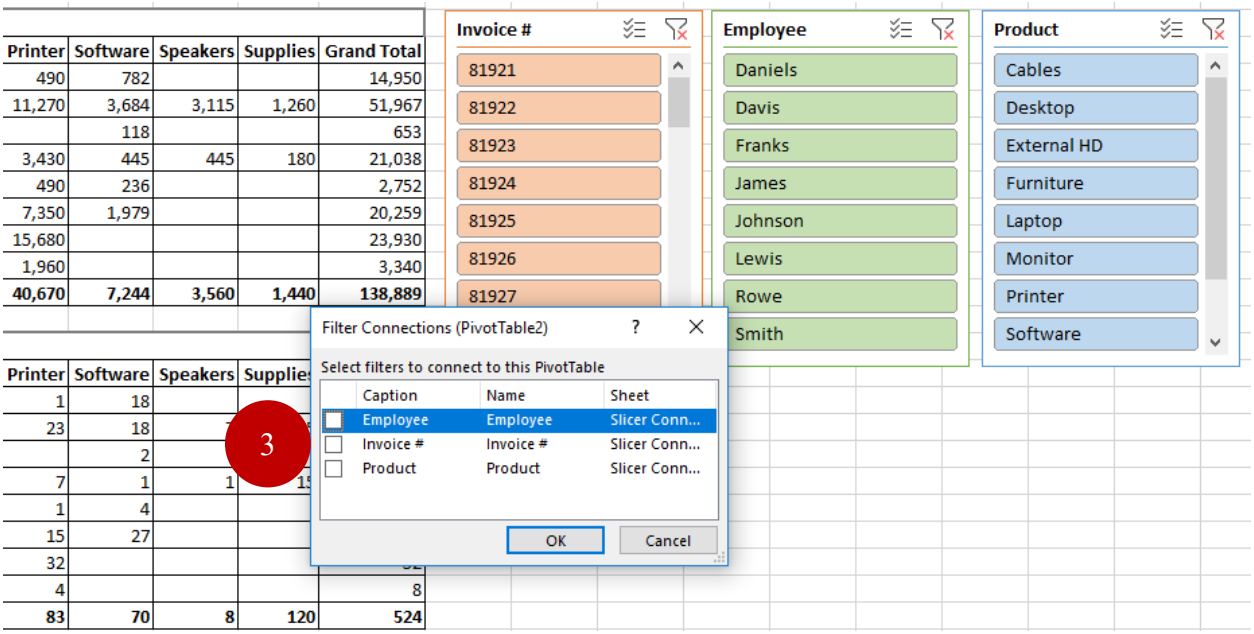
2. Align the Slicers next to the PivotTables and apply a new design was applied; click anywhere on the second PivotTable.



Revenue	Products										
Employees	Cables	Desktop	External HD	Furniture	Laptop	Monitor	Printer	Software	Speakers	Supplies	Grand Total
Daniels	288	8,900	270	445	1,995	1,780	490	782			14,950
Davis	48	16,020	2,850	2,225	7,335	4,160	11,270	3,684	3,115	1,260	51,967
Franks		445	90					118			653
James	48	6,230	1,025	445	7,540	1,250	3,430	445	445	180	21,038
Johnson	96				1,330	600	490	236			2,752
Lewis		1,335	445	445	4,215	4,490	7,350	1,979			20,259
Rowe		4,895	90	445	1,330	1,490	15,680				23,930
Smith		1,335	45				1,960				3,340
Grand Total	**480**	**39,160**	**4,815**	**4,005**	**23,745**	**13,770**	**40,670**	**7,244**	**3,560**	**1,440**	**138,889**

Units Sold	Products										
Employees	Cables	Desktop	External HD	Furniture	Laptop	Monitor	Printer	Software	Speakers	Supplies	Grand Total
Daniels	24	20	6	1	3	4	1	18			77
Davis	4	36	10		15	10	23	18	7	105	233
Franks		1	2					2			5
James	4	14	5		2	4	7	1	1	15	64
Johnson	8				2	2	1	4			17
Lewis		3	1	1	7	14	15	27			68
Rowe		11	2	1	2	4	32				52
Smith		3	1				4				8
Grand Total	**40**	**88**	**27**	**9**	**41**	**38**	**83**	**70**	**8**	**120**	**524**

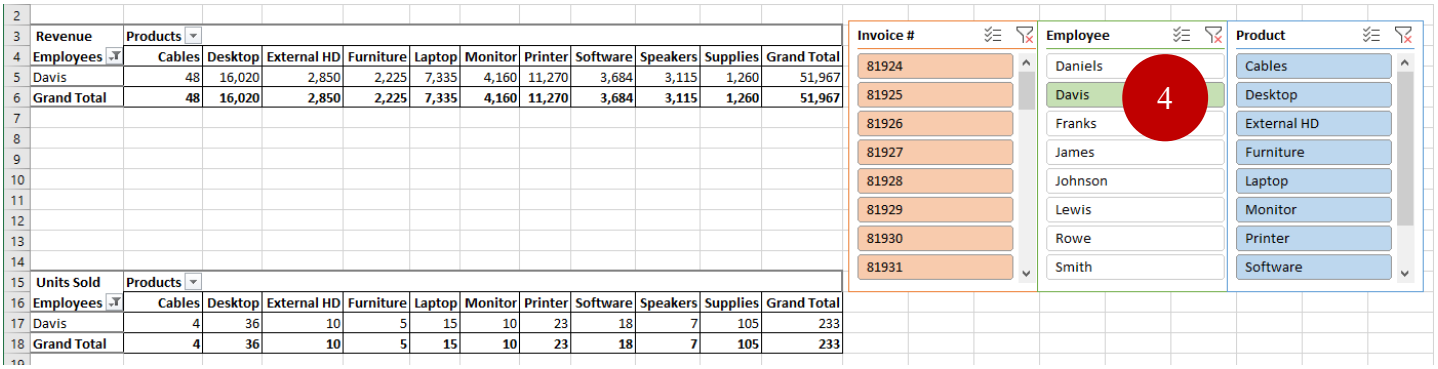
3. Click on Filter Connections from the Analyze tab (if you're using an older version of Excel, you may see a drop-down arrow on the Slicer button, which gives you the option to choose Slicer Connections). Check off all three Fields under Caption; click OK.



Printer	Software	Speakers	Supplies	Grand Total
490	782			14,950
11,270	3,684	3,115	1,260	51,967
	118			653
3,430	445	445	180	21,038
490	236			2,752
7,350	1,979			20,259
15,680				23,930
1,960				3,340
40,670	**7,244**	**3,560**	**1,440**	**138,889**

Printer	Software	Speakers	Supplie
1	18		
23	18		
	2		
7	1	1	15
1	4		
15	27		
32			
4			
83	**70**	**8**	**120**

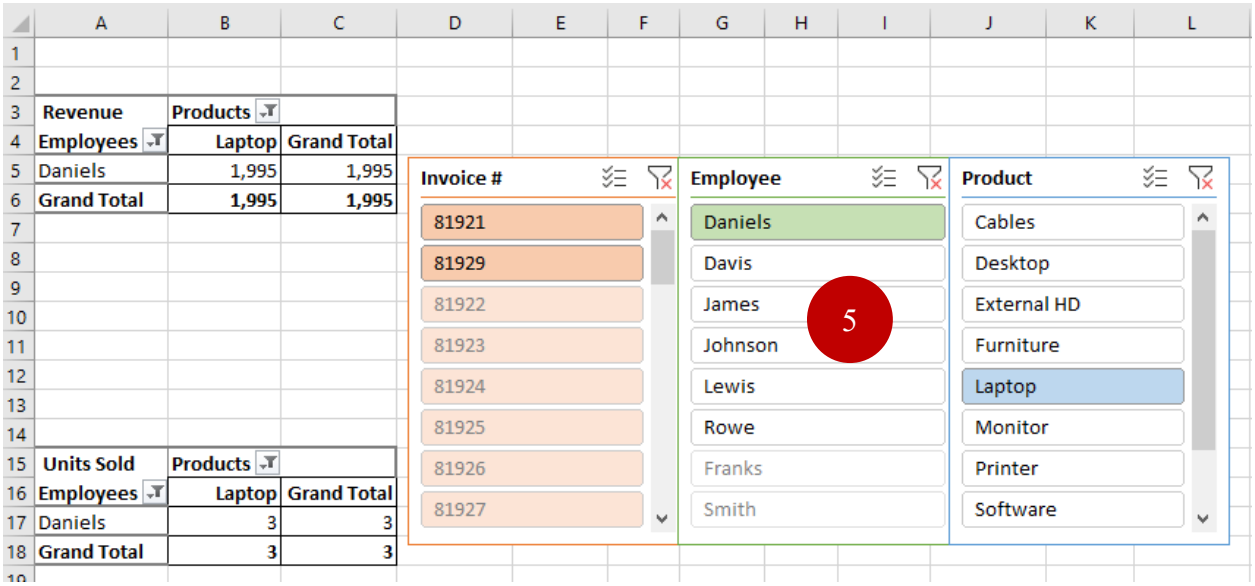
4. You can then filter both PivotTables by invoice number, employee or product. This shows you the PivotTables filtered by the name “Davis”.



Revenue	Products										
Employees	Cables	Desktop	External HD	Furniture	Laptop	Monitor	Printer	Software	Speakers	Supplies	Grand Total
Davis	48	16,020	2,850	2,225	7,335	4,160	11,270	3,684	3,115	1,260	51,967
Grand Total	48	16,020	2,850	2,225	7,335	4,160	11,270	3,684	3,115	1,260	51,967

Units Sold	Products										
Employees	Cables	Desktop	External HD	Furniture	Laptop	Monitor	Printer	Software	Speakers	Supplies	Grand Total
Davis	4	36	10	5	15	10	23	18	7	105	233
Grand Total	4	36	10	5	15	10	23	18	7	105	233

5. You can de-select the filters on the Slicers by clicking on the Filter button. To select multiple Slicers that are connected to another Slicer, you can click on the Multiselect button. Let’s click on the Slicers that show the number of desktop and laptop computers that were sold by Daniels, along with the sales revenue and invoice numbers:



Revenue	Products	
Employees	Laptop	Grand Total
Daniels	1,995	1,995
Grand Total	1,995	1,995

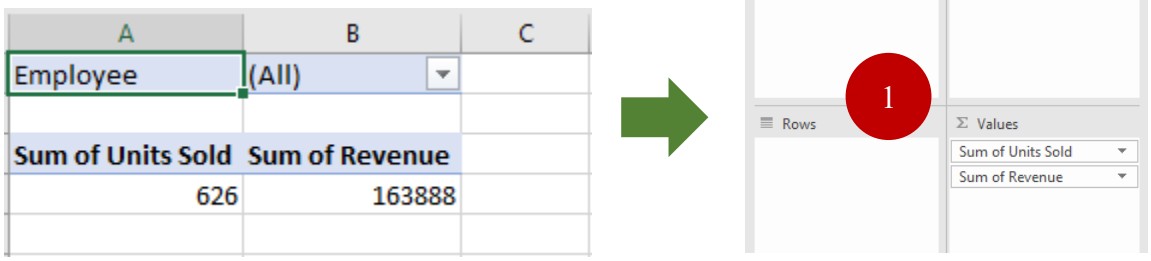
Units Sold	Products	
Employees	Laptop	Grand Total
Daniels	3	3
Grand Total	3	3

Report Filter Pages

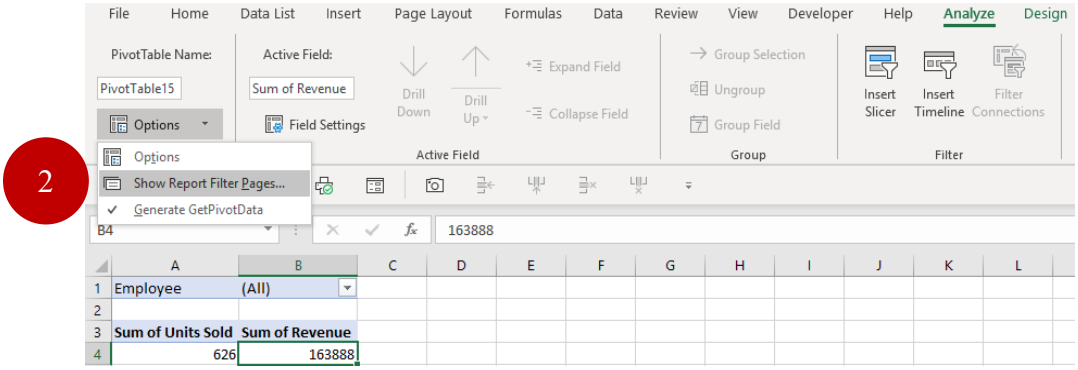
Objective: To create an individual worksheet for each employee, which shows the units sold and sales revenue numbers.

1. Create a PivotTable using the following Fields:

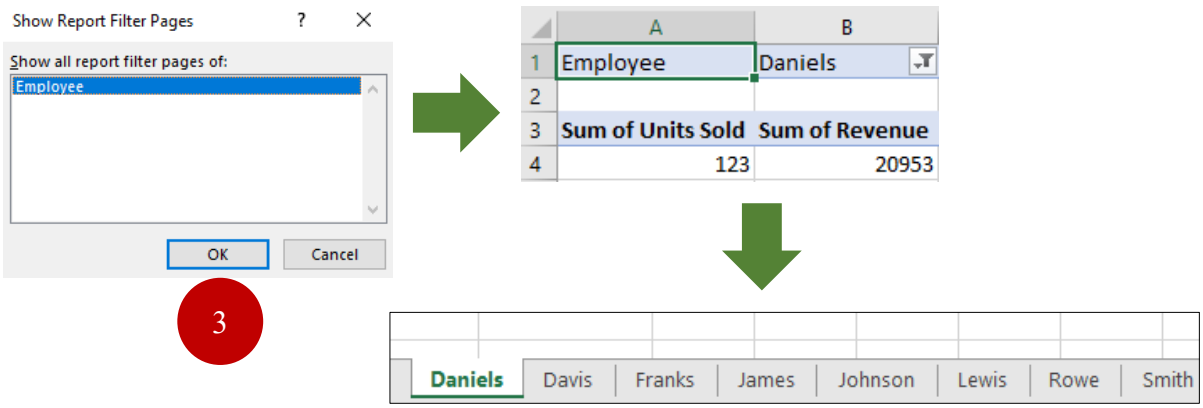
   Employee – Filters area
   Units Sold – Values area
   Revenue – Values area



2. Click on any cell within the PivotTable, then click on the Analyze tab. Click on the Options drop-down in the PivotTable group. Choose Show Report Filter Pages.



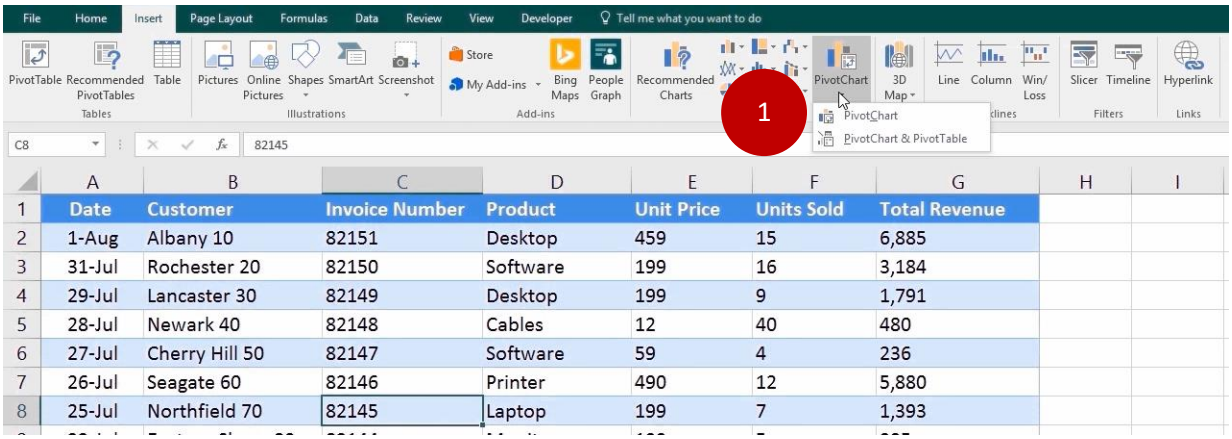
3. A dialog box will appear that displays the Field being used to create the reports; click OK. You will now see multiple worksheets with an employee name on each tab. If you double-click on cell A3 or B3, a new worksheet will be created that displays a summary of all the numbers used to calculate the total:



Create a PivotChart

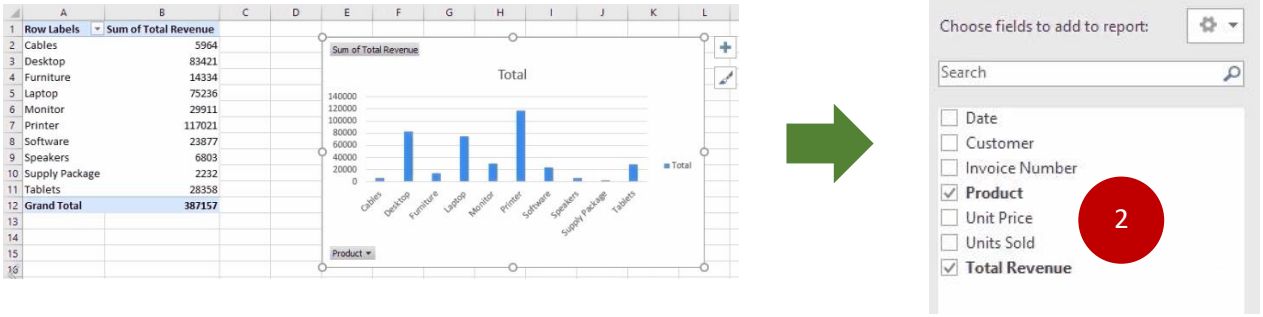
Objective: To create a chart using PivotTable data.

1. Click on the data, then click on Insert, Chart, PivotChart.

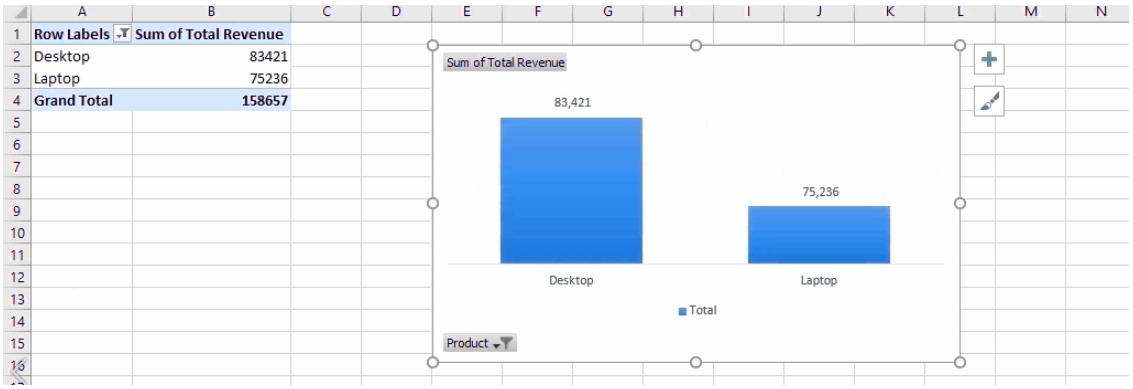


	A	B	C	D	E	F	G
1	Date	Customer	Invoice Number	Product	Unit Price	Units Sold	Total Revenue
2	1-Aug	Albany 10	82151	Desktop	459	15	6,885
3	31-Jul	Rochester 20	82150	Software	199	16	3,184
4	29-Jul	Lancaster 30	82149	Desktop	199	9	1,791
5	28-Jul	Newark 40	82148	Cables	12	40	480
6	27-Jul	Cherry Hill 50	82147	Software	59	4	236
7	26-Jul	Seagate 60	82146	Printer	490	12	5,880
8	25-Jul	Northfield 70	82145	Laptop	199	7	1,393

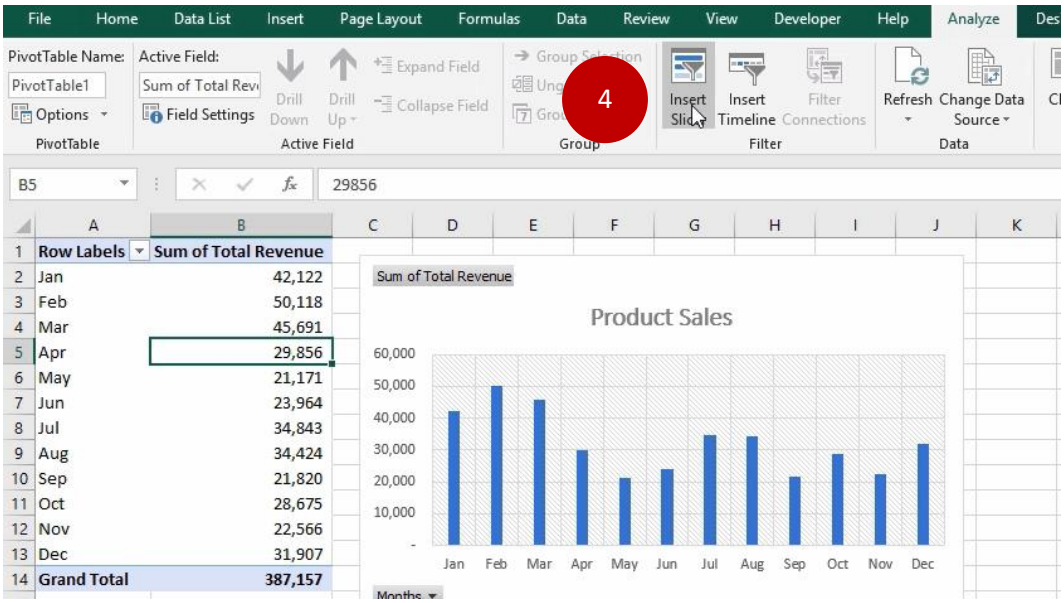
2. Check off Product and Total Revenue.



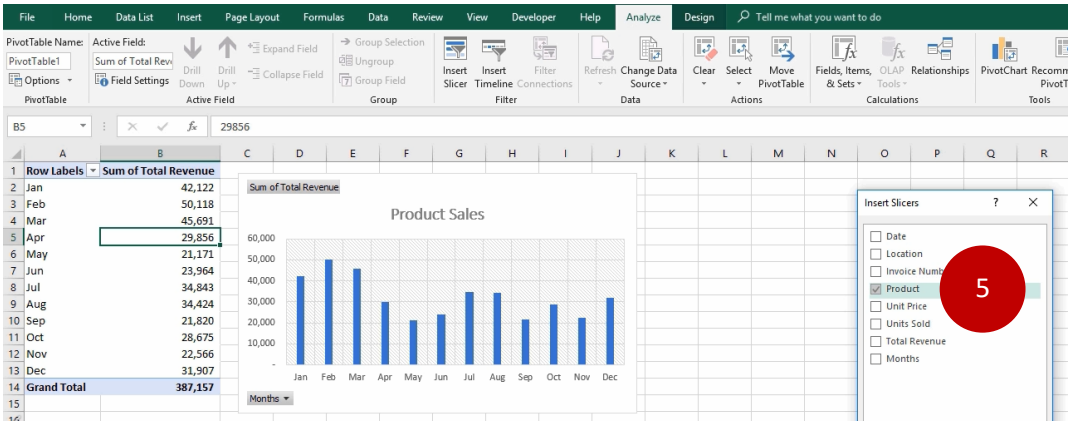
3. Click on the Design tab, then choose Layout 7 under Chart Styles; choose Layout 4 under Quick Layouts; then experiment with the formatting and date filter options (see example below).



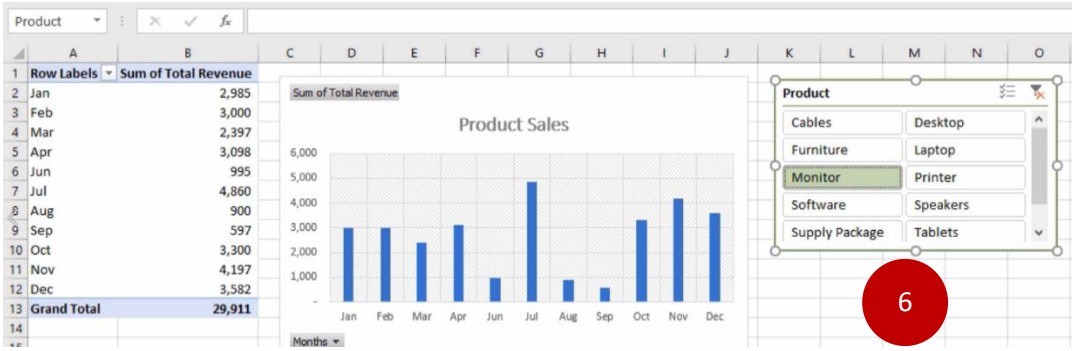
4. To make the PivotChart interactive, click on the PivotTable, then click on the Analyze tab; click on Insert Slicer.



5. Check off one of the PivotTable Fields (i.e. Product); click OK.



6. Click on the Slicer, then click on Options under Slicer Tools to change the number of columns, height or width. Click on the different products to see the changes to the PivotChart:



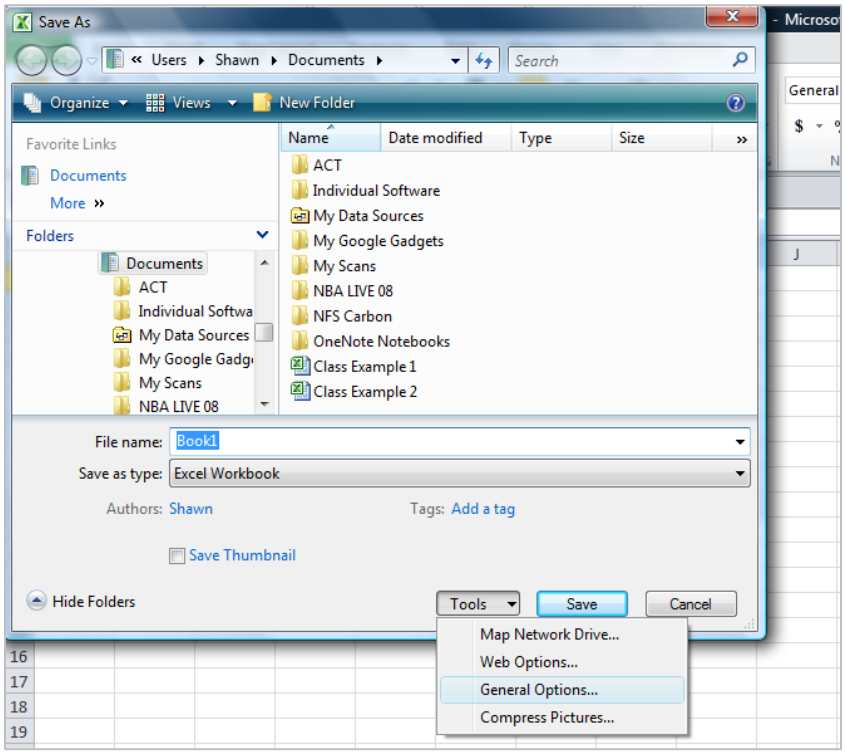
Chapter 10: Create Passwords and Protect Cells

One of the main reasons for using protection tools in Excel is so that your work cannot be accidentally or intentionally altered or deleted. This is especially important for worksheets that have confidential information, complex formatting or formulas.

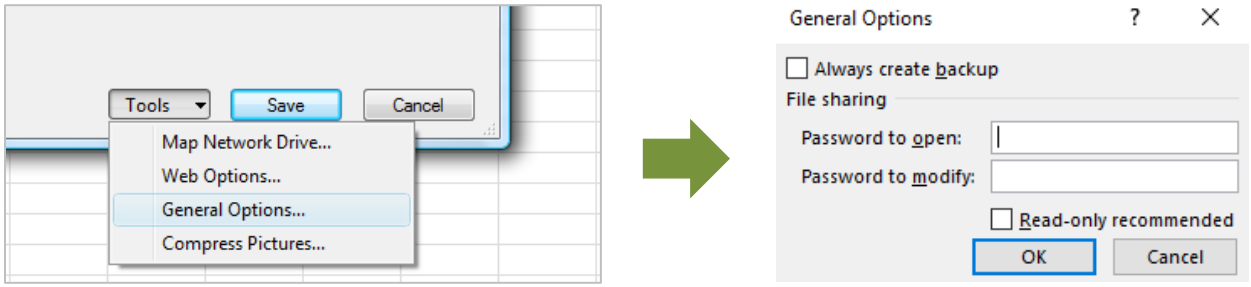
Password Protection

Using passwords will restrict the ability to open and make changes to a workbook to the person who created the workbook and others who have been given a password.

Click the File tab and choose Save As.



From the Save As dialog box, click Tools and choose General Options. Choose a password and enter it. You can also choose a separate password to modify the workbook.

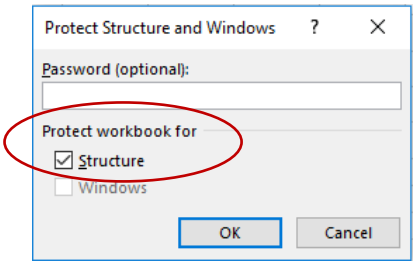


Protect the Workbook Structure

Click on the Review tab → Protect group → Protect Workbook button; the dialog box will appear.

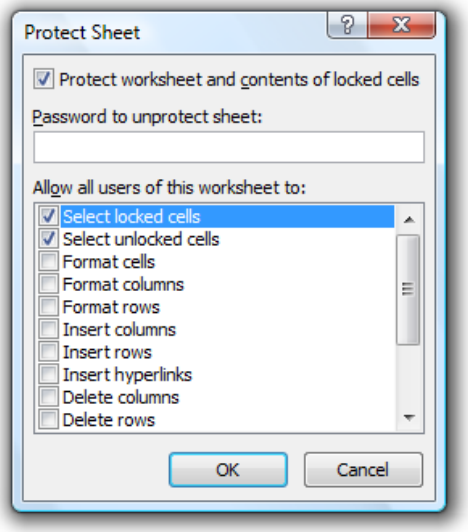
By checking off Structure you can

- Prevent users from inserting deleting or renaming worksheets.
- Prevent users from displaying hidden worksheets.



Protect an Entire Worksheet

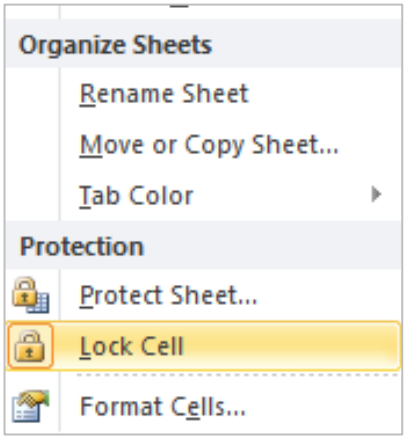
Review tab → Protect group → Protect Sheet button. The dialog box will appear. Use the scroll bar to check/uncheck the options that prevent certain changes from being made on the worksheet; click OK when finished.



Protect Cells Within the Worksheets

Protecting individual cells or a range of cells is a **two-step process**. The first step is to lock the cells that the user will be allowed to make changes to. Select cells that will be locked (cells B2 to B4). Click on the Home tab, then click on the Format drop-down in the Cells group. Under Protection, click on Lock Cell.

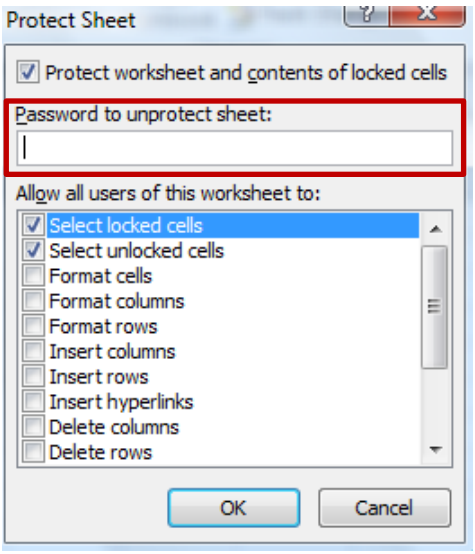
	A	B
1	**Monthly Expenses**	
2	Auto	$ 300
3	Travel	$ 323
4	Meals	$ 200
5	**Total**	$ 823



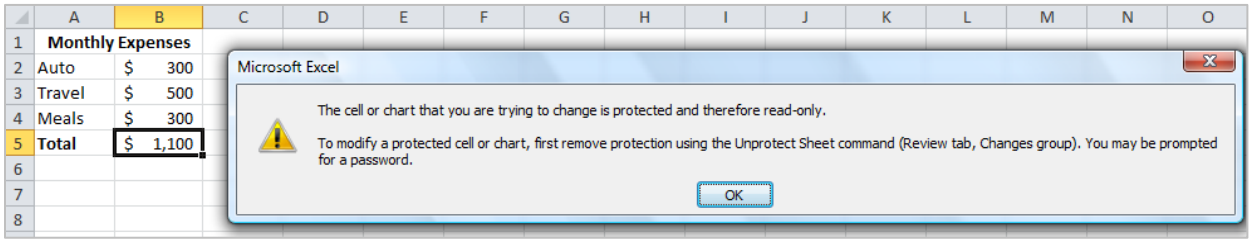
Step two is to protect the worksheet.

Click on the Review tab, click on the Protect Sheet button. in the Protect group. Enter a password (optional) click OK.

Make sure that the Select locked cells and the Select unlocked cells are both checked off. If these options are not selected the user will not be able to select any of the cells from the worksheet.



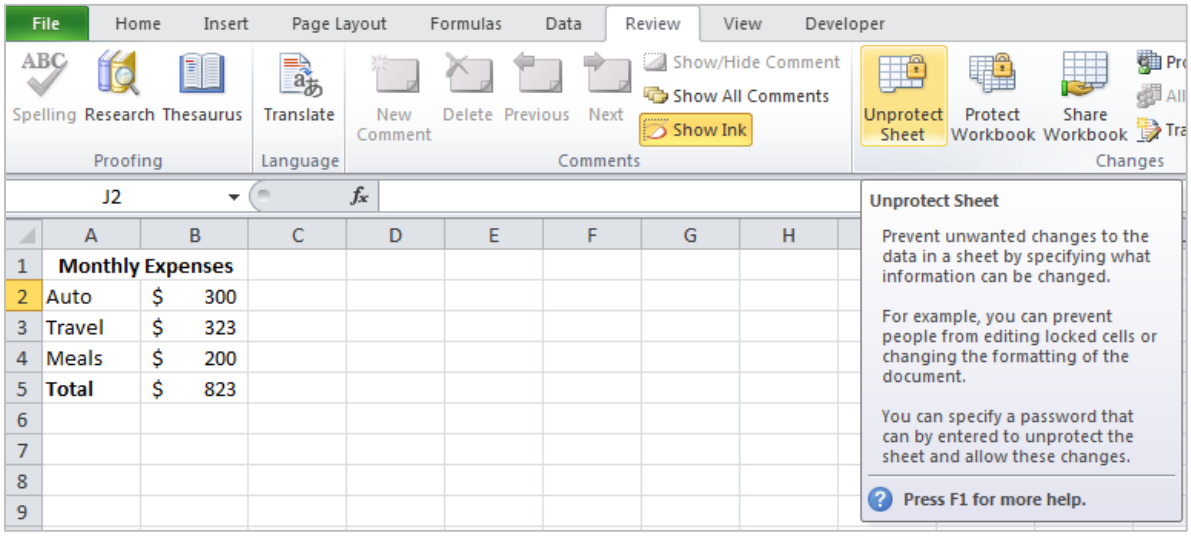
What happens when you attempt to change a protected cell?



The user tried to change cell D5, which contains a formula that adds the numbers within that column. An error message will appear anytime a user tries to type information into a protected cell.

Unprotect a Worksheet and Worksheet Cells

Home tab → Changes group → Unprotect Sheet:



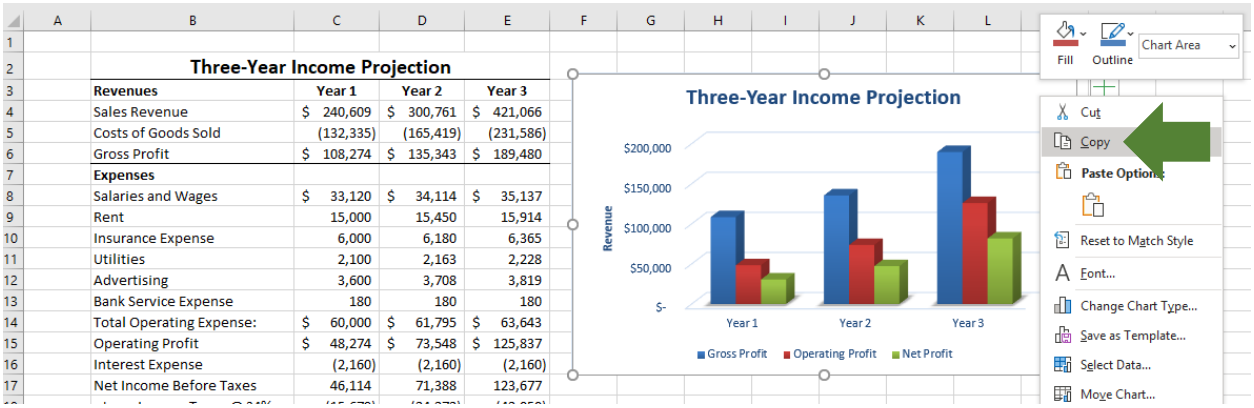
Chapter 11: Using Excel with Office Applications

In this chapter, we'll look at a few of the many ways that Excel data is used by other office applications. After reading this chapter, you should be able to:

- Copy and paste Excel data onto Word documents
- Copy and paste Excel data onto PowerPoint slides
- Embed worksheets into Word documents
- Create a link between worksheets and Word document
- Convert embedded worksheets into charts
- Paste Excel data onto PowerPoint slides
- Import Excel files into Access
- Export Access files to Excel

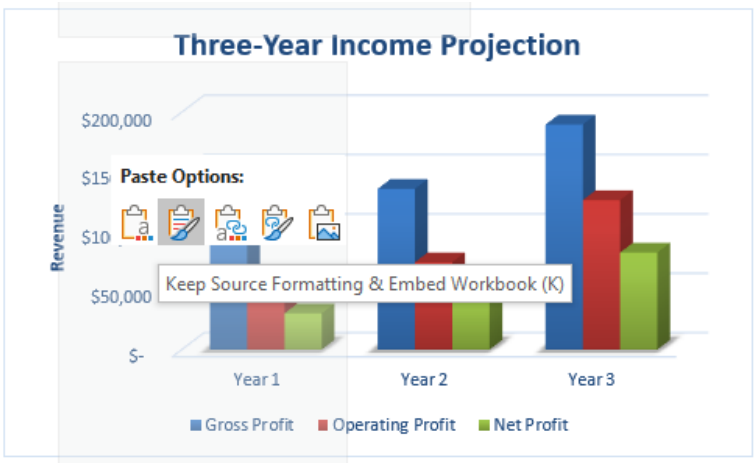
Copy and paste Excel data

Let's use the example of a worksheet that has both numbers and a chart. Start by right-clicking on the chart; click on Copy.

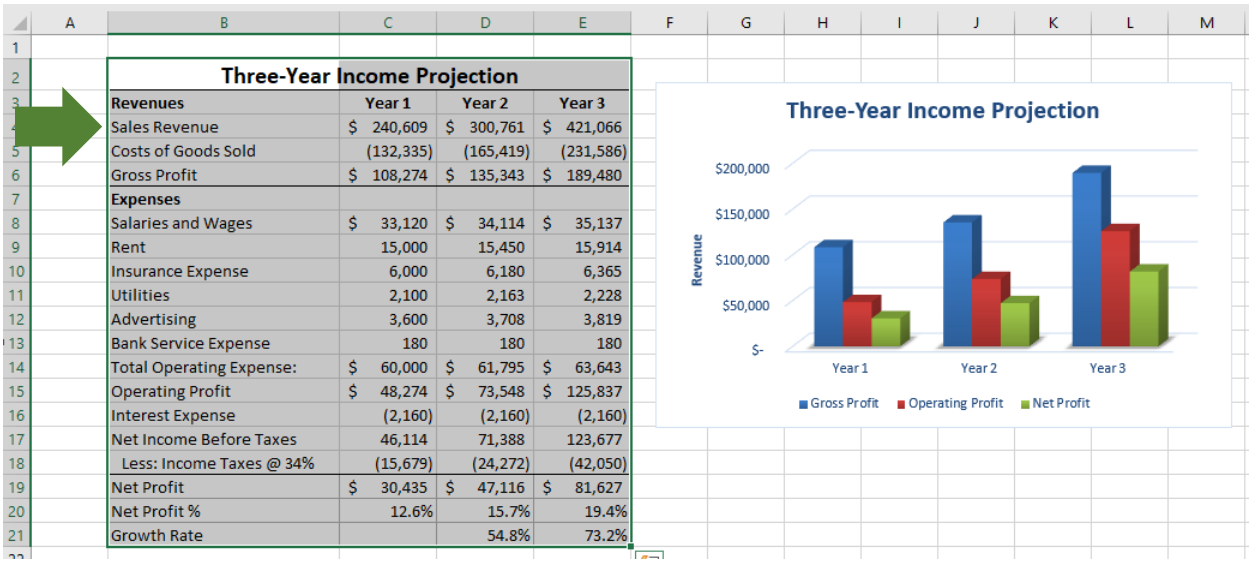


	Three-Year Income Projection			
	Revenues	**Year 1**	**Year 2**	**Year 3**
	Sales Revenue	$ 240,609	$ 300,761	$ 421,066
	Costs of Goods Sold	(132,335)	(165,419)	(231,586)
	Gross Profit	$ 108,274	$ 135,343	$ 189,480
	Expenses			
	Salaries and Wages	$ 33,120	$ 34,114	$ 35,137
	Rent	15,000	15,450	15,914
	Insurance Expense	6,000	6,180	6,365
	Utilities	2,100	2,163	2,228
	Advertising	3,600	3,708	3,819
	Bank Service Expense	180	180	180
	Total Operating Expense:	$ 60,000	$ 61,795	$ 63,643
	Operating Profit	$ 48,274	$ 73,548	$ 125,837
	Interest Expense	(2,160)	(2,160)	(2,160)
	Net Income Before Taxes	46,114	71,388	123,677

In this example, we'll paste the chart onto a new Word document by right-clicking in Word to view the different Paste Options. The first four options allow you to make changes to the chart after it's been pasted. The last Paste option is called Picture, which will paste the chart into Word exactly the way it appears in Excel.



To copy and paste the worksheet data into Word, use the mouse to select the data; press CTRL+C.



Three-Year Income Projection			
Revenues	**Year 1**	**Year 2**	**Year 3**
Sales Revenue	$ 240,609	$ 300,761	$ 421,066
Costs of Goods Sold	(132,335)	(165,419)	(231,586)
Gross Profit	$ 108,274	$ 135,343	$ 189,480
Expenses			
Salaries and Wages	$ 33,120	$ 34,114	$ 35,137
Rent	15,000	15,450	15,914
Insurance Expense	6,000	6,180	6,365
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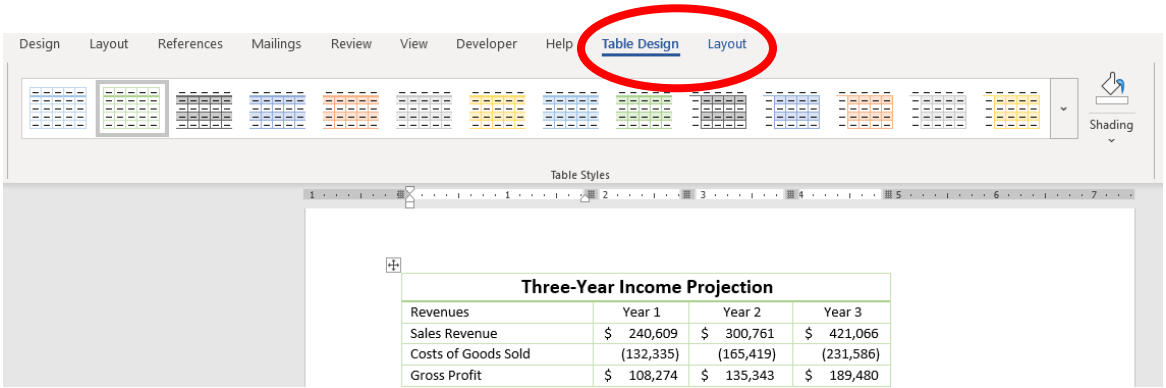
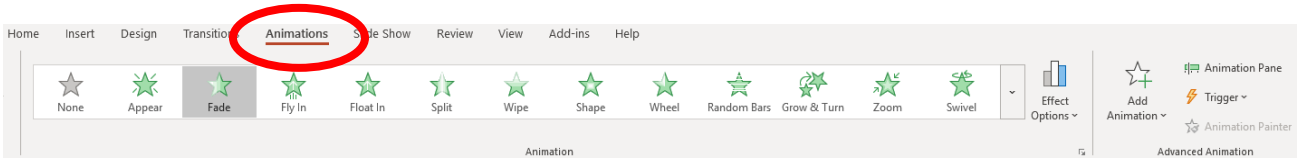
Bank Service Expense	180	180	180
Total Operating Expense:	$ 60,000	$ 61,795	$ 63,643
Operating Profit	$ 48,274	$ 73,548	$ 125,837
Interest Expense	(2,160)	(2,160)	(2,160)
Net Income Before Taxes	46,114	71,388	123,677
Less: Income Taxes @ 34%	(15,679)	(24,272)	(42,050)
Net Profit	$ 30,435	$ 47,116	$ 81,627
Net Profit %	12.6%	15.7%	19.4%
Growth Rate		54.8%	73.2%

You have the same options to use Destination Theme, Keep Source Formatting or paste the data as a picture. If you choose Keep Source Formatting, for example, you'll see that the data will be formatted inside of Word as a Table. This means that you can use different style and layout options to change the color and format of the data after it's been pasted.



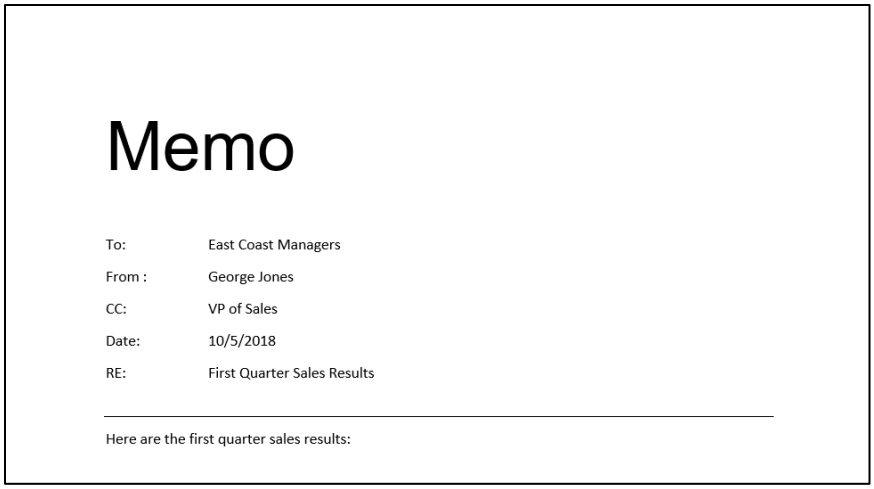
Three-Year Income Projection			
Revenues	Year 1	Year 2	Year 3
Sales Revenue	$ 240,609	$ 300,761	$ 421,066
Costs of Goods Sold	(132,335)	(165,419)	(231,586)
Gross Profit	$ 108,274	$ 135,343	$ 189,480

To copy and paste Excel data onto a PowerPoint slide, start by clicking on New Slide and choosing Blank. You'll notice that when you paste charts, you have the option of applying one or more Animations. This allows you to control how the elements of the chart appear during a slide presentation.



Embed a New Excel Worksheet into Word

Start by creating a new Word document:



Memo

To: East Coast Managers

From : George Jones

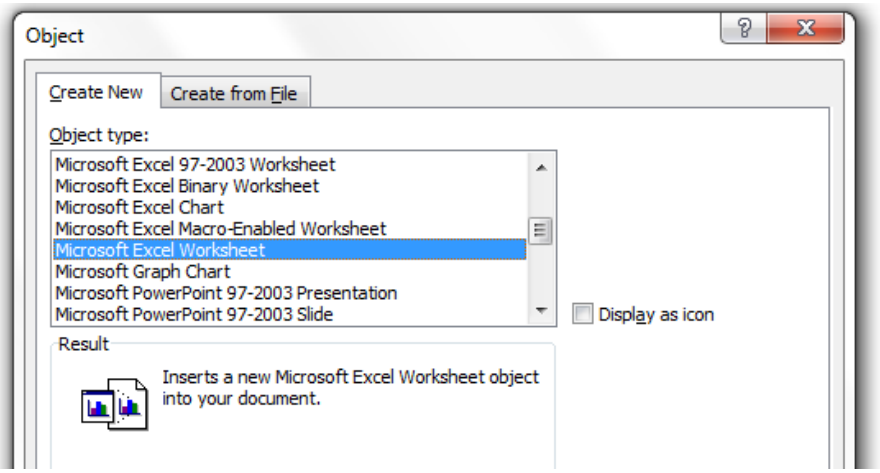
CC: VP of Sales

Date: 10/5/2018

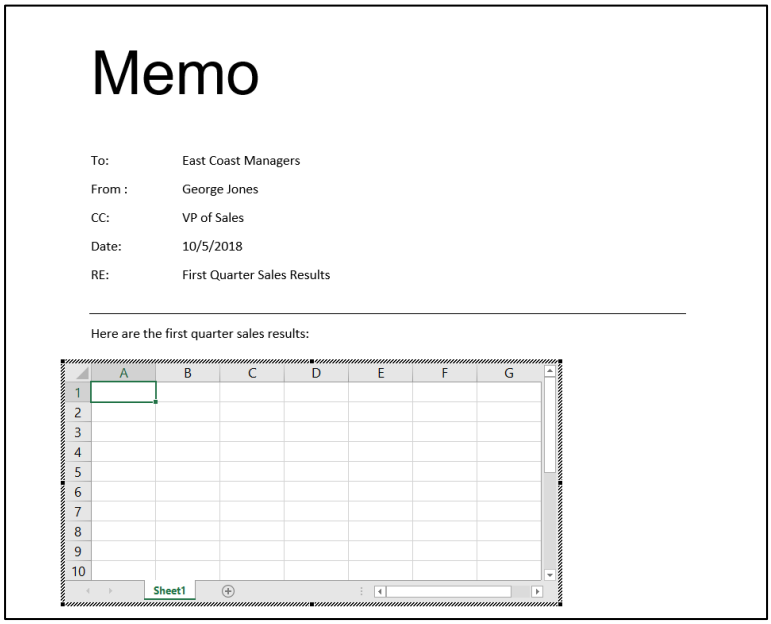
RE: First Quarter Sales Results

Here are the first quarter sales results:

We want to create a worksheet in Excel that describes the first quarter's net income results, which includes sales results for January, February and March. The first way we will do this is to create the new worksheet in Word. This can be done by choosing the Insert tab and choosing the right down arrow next to the Object button in the Text group; choose Insert object. Choose Microsoft Excel Worksheet; choose OK:



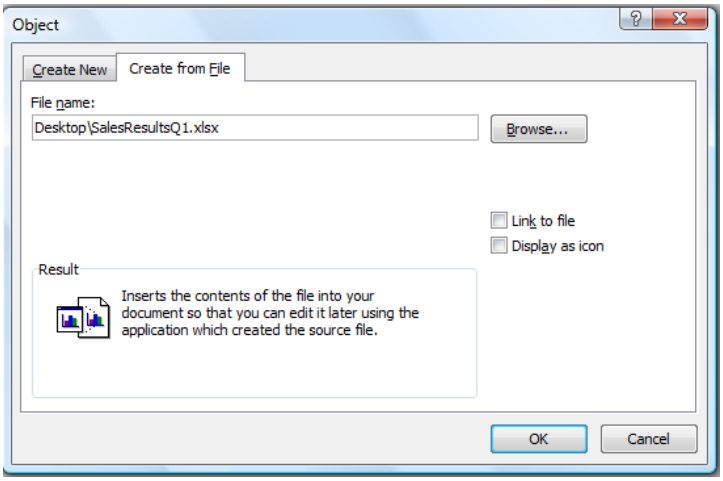
A worksheet will be inputted into the Word document:



When you double-click inside one of the cells, you can see where the rows, columns and cells are available for data to be entered. The Word ribbon will be temporarily replaced with an Excel ribbon. In this example, information regard sales performance for the first quarter will be typed into the worksheet cells. After entering the information, the size of the worksheet can be adjusted to only show the data that was entered. The Gridlines option from the View tab can be unchecked so that they do not appear on the memo.

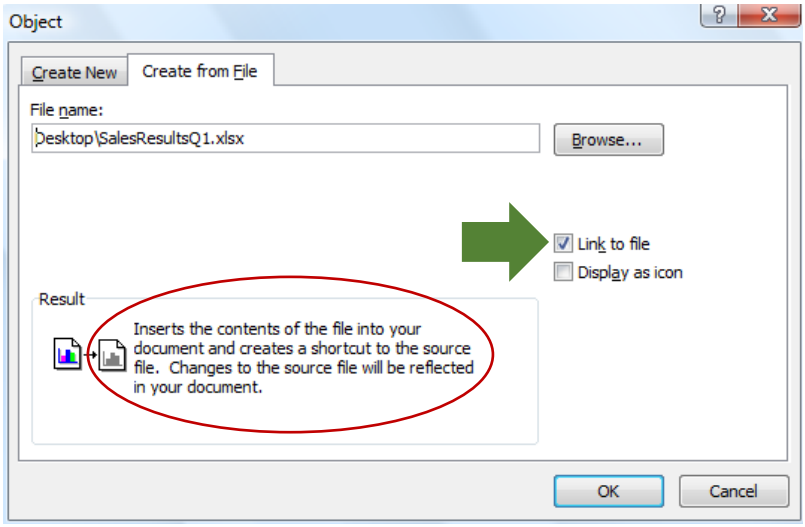
Embed an Existing Worksheet into Word

If you already have a workbook prepared with the information you want to embed into the Word document, you can use the same menu option we used to create the new worksheet, which is to choose the Object down arrow from the Insert menu. In this example, we entered the same information that we used to create a new worksheet in Excel and saved it on the desktop as SalesResultsQ1. Choose OK to embed the worksheet.



Link an Existing Worksheet to a Word Document

Excel files that are linked to Word documents will allow the user to make changes automatically be updated in the file. To see how this works, we can once again choose the Object down arrow from the Insert tab. Choose Create from File:



Notice that when the Link to file box is checked, the Result section of the dialog box will provide a description of what this feature does and how it works. Choose SalesResultsQ1 and click OK.

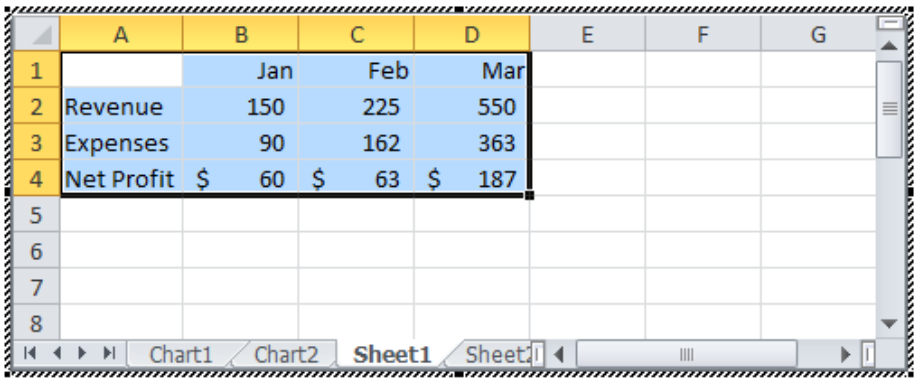
When you click on the one of the cells in the worksheet, the Excel application will open. After making the desired changes, save the Excel file. Right-click on the linked worksheet in Word and choose Update Link. You should now see the changes you made in Excel reflected in the linked worksheet displayed in Word.

Convert an Excel Worksheet into a Chart Object

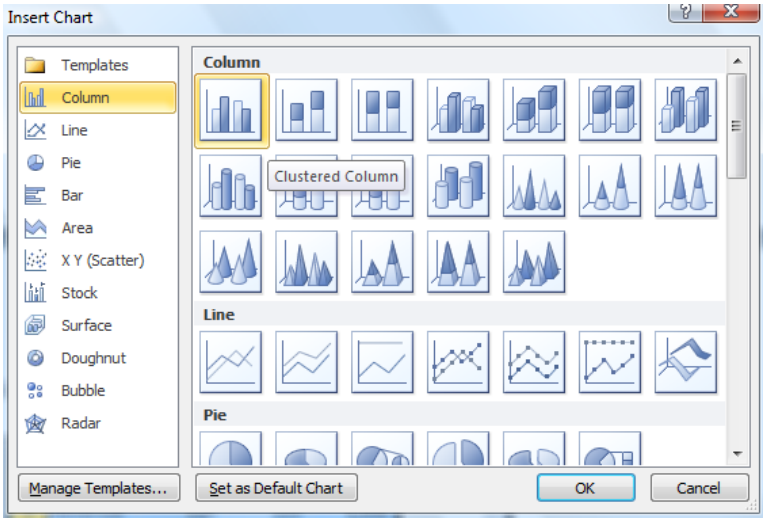
1. Start by choosing a worksheet to embed into the Word document by choosing the Object drop-down arrow from the Insert tab.

2. Choose Object, Create from File and double-click on the Excel file you want to use. In this example, we'll use a file called SalesResultsQ1.

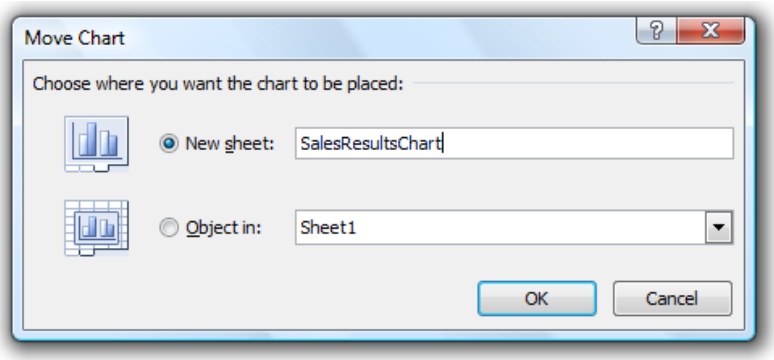
Select the data to be used in the chart object:



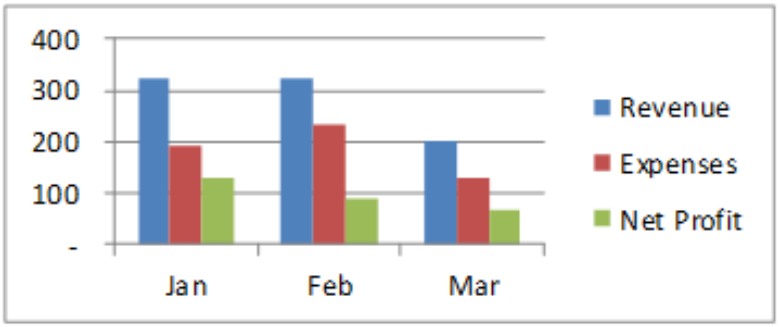
3. Let's create a column chart by clicking the Insert tab and then choosing the Chart button from the Illustrations group; choose the Clustered Column option and click OK.



4. To make the chart more presentable in a Word document, you will want to move the chart to a separate worksheet. You can do this by choosing the Move Chart button from the Design tab. Name the chart and click OK.



5. Resize the chart as needed to the desired size; click away from the chart to embed it into the Word document:



Embed or Link an Excel Workbook to PowerPoint

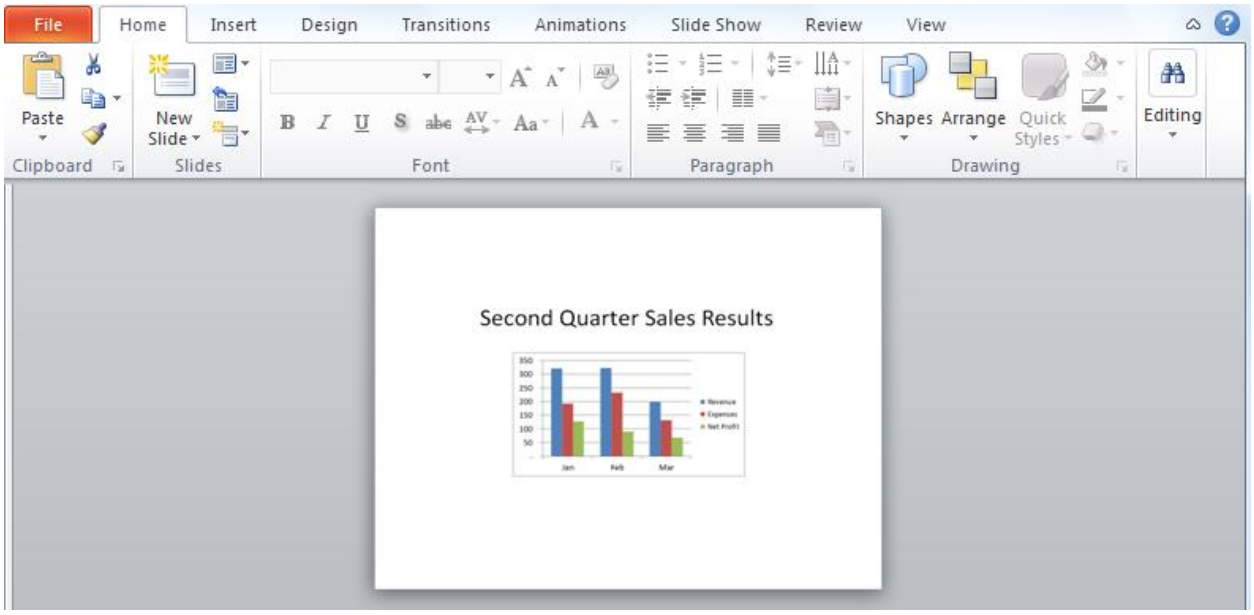
If you need to present Excel numbers on a PowerPoint slide, you can use the same methods used in Word to link or embed the data.

1. Open the Microsoft PowerPoint application and create a new slide.

2. Choose Create new or Create from file; click OK.

3. Just as with Microsoft Word, you can insert an existing worksheet to PowerPoint. We will again choose the SalesResultQ1 file using the Create from file option; click OK.

4. Since this worksheet will be presented to a large group, we can show the data using a chart instead of just numbers on a worksheet. Follow the same procedure we used to insert an embedded chart in Word.



Chapter 12: Introduction to Macros

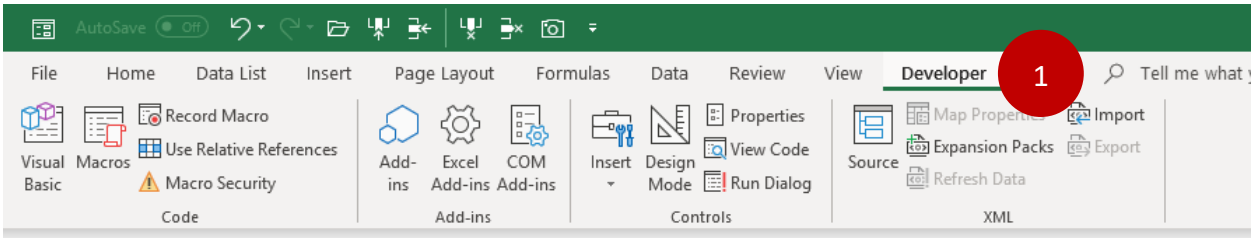
Recording macros can make working with Excel more efficiently because you are able to record the keystrokes and mouse clicks that are used to perform repetitive tasks. Some of the common tasks that can be recorded as macros include printing a worksheet, inputting formulas or functions and viewing filtered reports.

Record a Macro

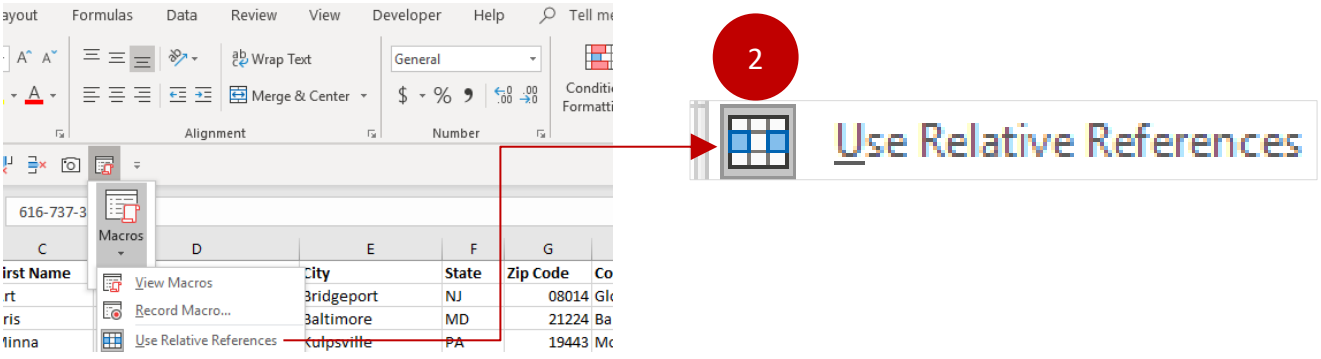
To record a macro, you must first make sure that the Developer tab is added to the ribbon.

1. Click on File, then click on Options. Click on Customize Ribbon, then check off the Developer tab; click OK.

The Developer tab now appears on the Ribbon. You may also want to add the Macros button to the Quick Access Toolbar (see page 11 for instructions on how to do this).

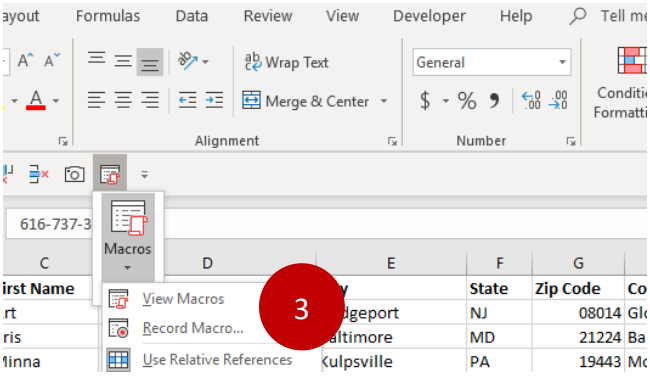


2. Click on the Macros button on the Quick Access Toolbar, then click on the down arrow; click on Use Relative Reverences. You can tell it is turned on if you see the Use Relative References button surrounded by a gray band.

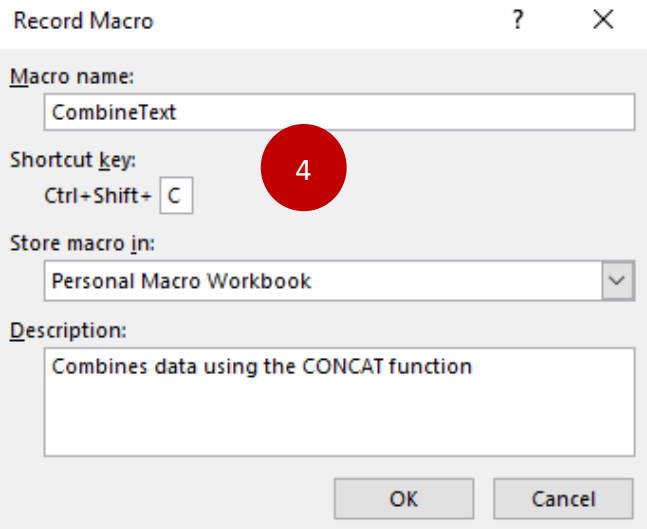


Use Macros to Input Functions

3. Click on the Record Macro button; a dialog box will appear:



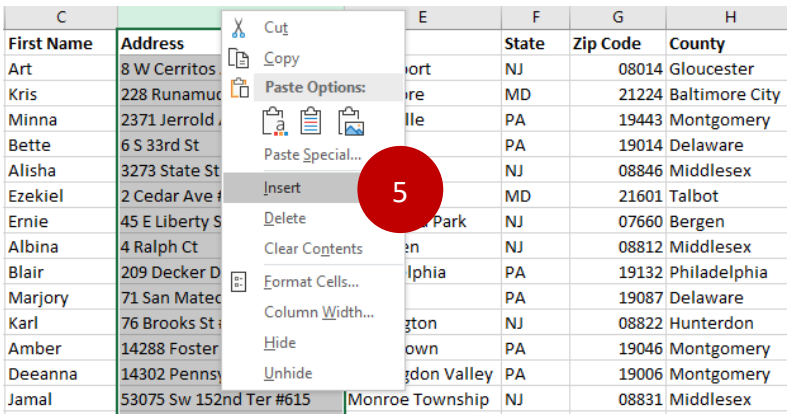
4. Enter the following information into the dialog box; click OK.



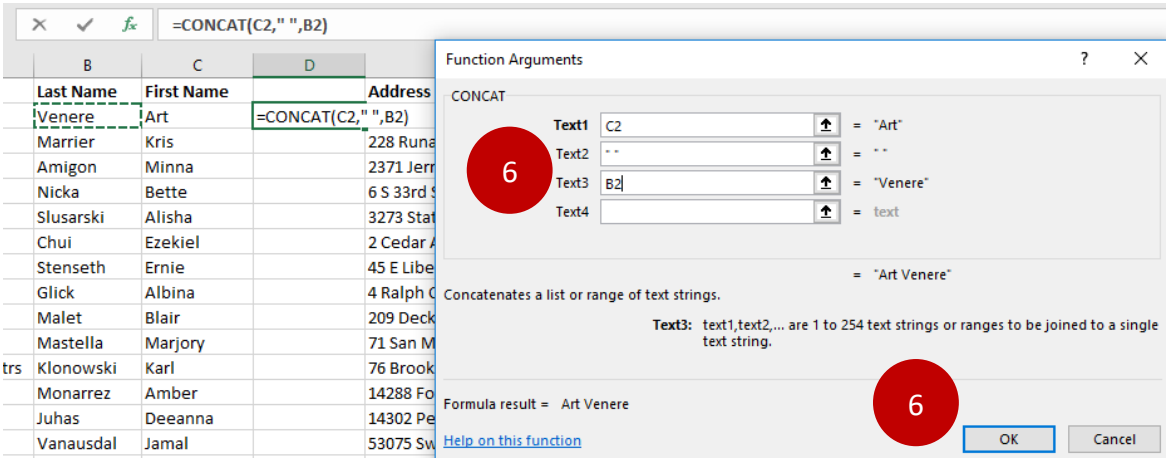
Macro storage options:

Personal Macro: Workbook is available whenever you use Excel
New Workbook: Will be stored in a new workbook
This Workbook: Macro can be saved in the workbook being used; this is the most common option to choose

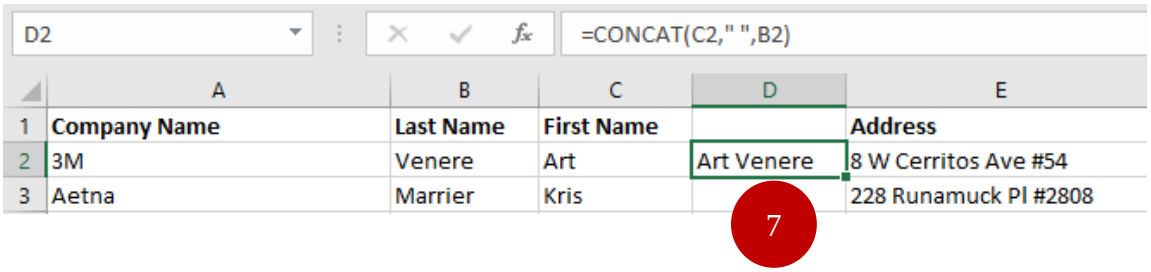
5. Click on the top of column D; click Insert.



6. Click on cell D2. Input the CONCAT function to combine the cells for first name and last name; click OK. Click on the Stop Recording button on the lower left side of the Status Bar.

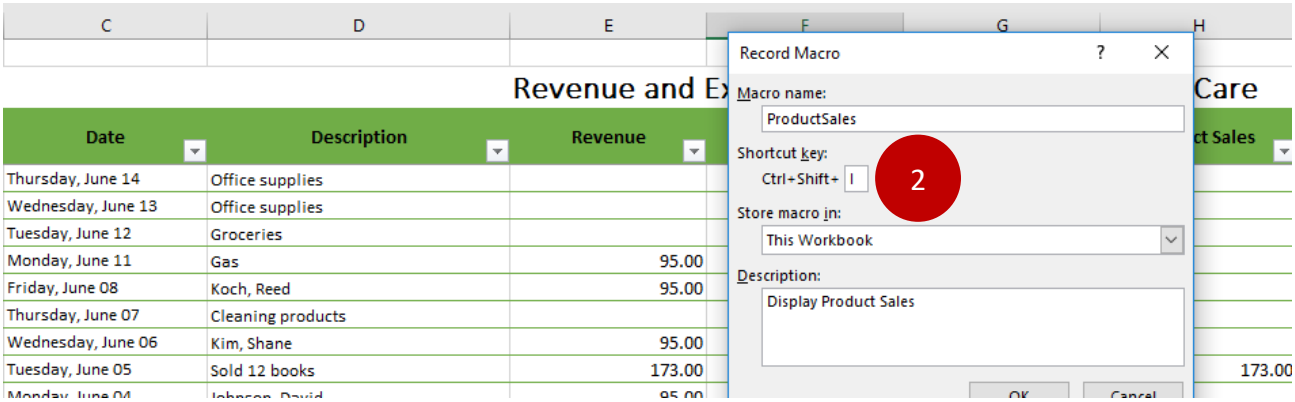


7. Click on cell D2, then press CTRL+SHIFT+C to input the results.

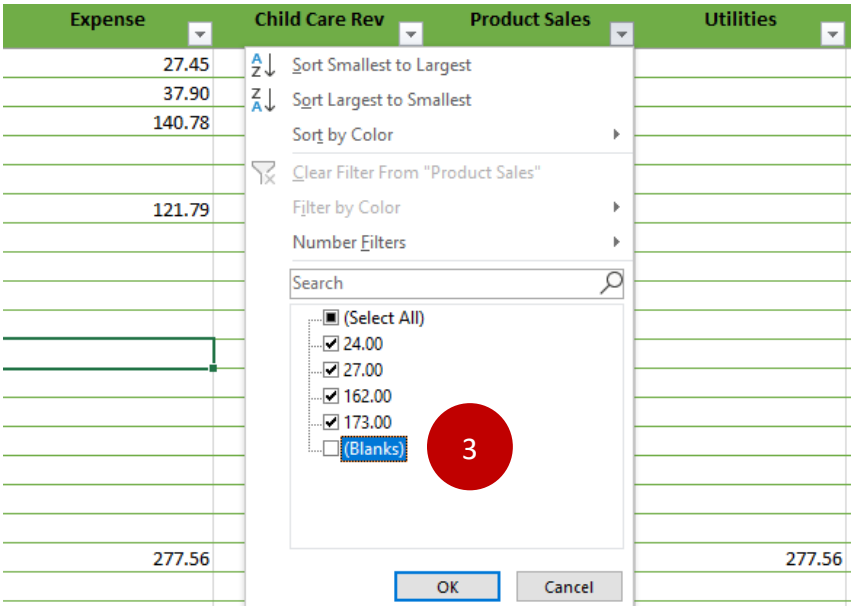


Use Macros to Display Filtered Data

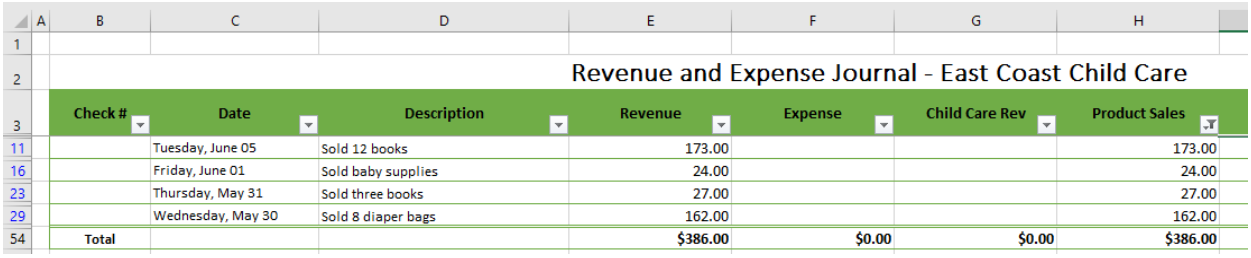
1. Click on the Macros button; choose Record Macros.
2. Enter the data shown into the Record Macro dialog box; click OK.



3. Click on the Product filter. Uncheck where is says “Blanks”; click OK and stop the recording.



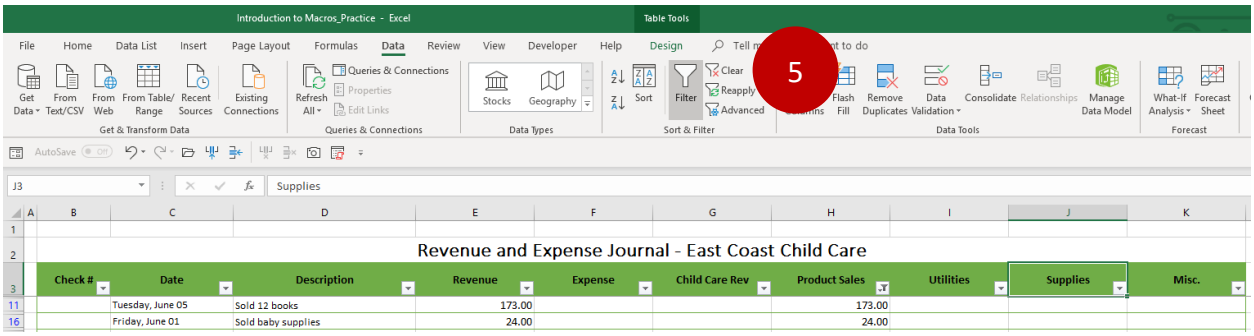
4. The worksheet will now display the Product Sales without any blank spaces.



Revenue and Expense Journal - East Coast Child Care

Check #	Date	Description	Revenue	Expense	Child Care Rev	Product Sales
	Tuesday, June 05	Sold 12 books	173.00			173.00
	Friday, June 01	Sold baby supplies	24.00			24.00
	Thursday, May 31	Sold three books	27.00			27.00
	Wednesday, May 30	Sold 8 diaper bags	162.00			162.00
Total			$386.00	$0.00	$0.00	$386.00

5. With the Data tab selected, click on the Clear button from the Sort and Filter group.

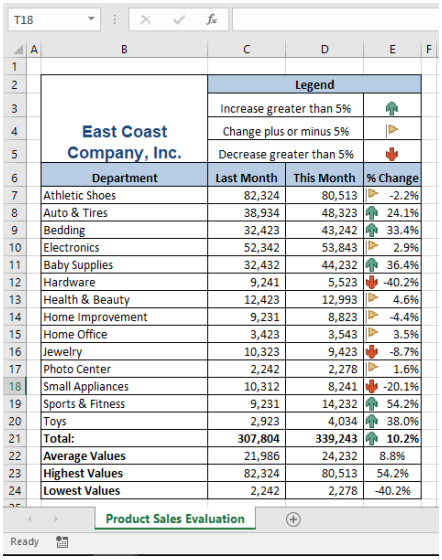


6. Repeat these steps to record Macros for the other two expenses .

Utilities use the shortcut key CTRL+SHIFT+Q
Supplies use the shortcut key CTRL+SHIFT+K

Run a Macro using Form Controls

1. Create a macro that prints a specific range of cells by selecting the section of the worksheet you want to print:



East Coast Company, Inc.

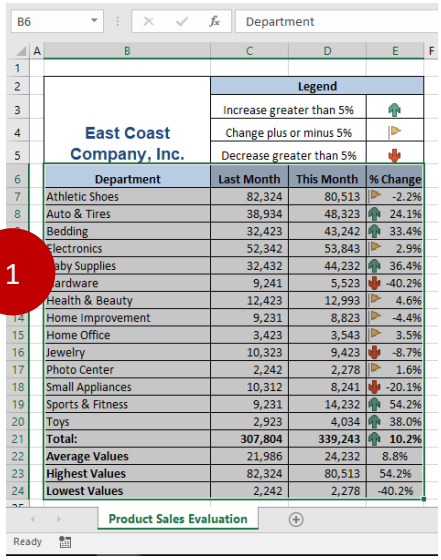
Legend	
Increase greater than 5%	
Change plus or minus 5%	
Decrease greater than 5%	

Department	Last Month	This Month	% Change
Athletic Shoes	82,324	80,513	-2.2%
Auto & Tires	38,934	48,323	24.1%
Bedding	32,423	43,242	33.4%
Electronics	52,342	53,843	2.9%
Baby Supplies	32,432	44,232	36.4%
Hardware	9,241	5,523	-40.2%
Health & Beauty	12,423	12,993	4.6%
Home Improvement	9,231	8,823	-4.4%
Home Office	3,423	3,543	3.5%
Jewelry	10,323	9,423	-8.7%
Photo Center	2,242	2,278	1.6%
Small Appliances	10,312	8,241	-20.1%
Sports & Fitness	9,231	14,232	54.2%
Toys	2,923	4,034	38.0%
Total:	**307,804**	**339,243**	**10.2%**
Average Values	21,986	24,232	8.8%
Highest Values	82,324	80,513	54.2%
Lowest Values	2,242	2,278	-40.2%

Product Sales Evaluation

Ready

1



East Coast Company, Inc.

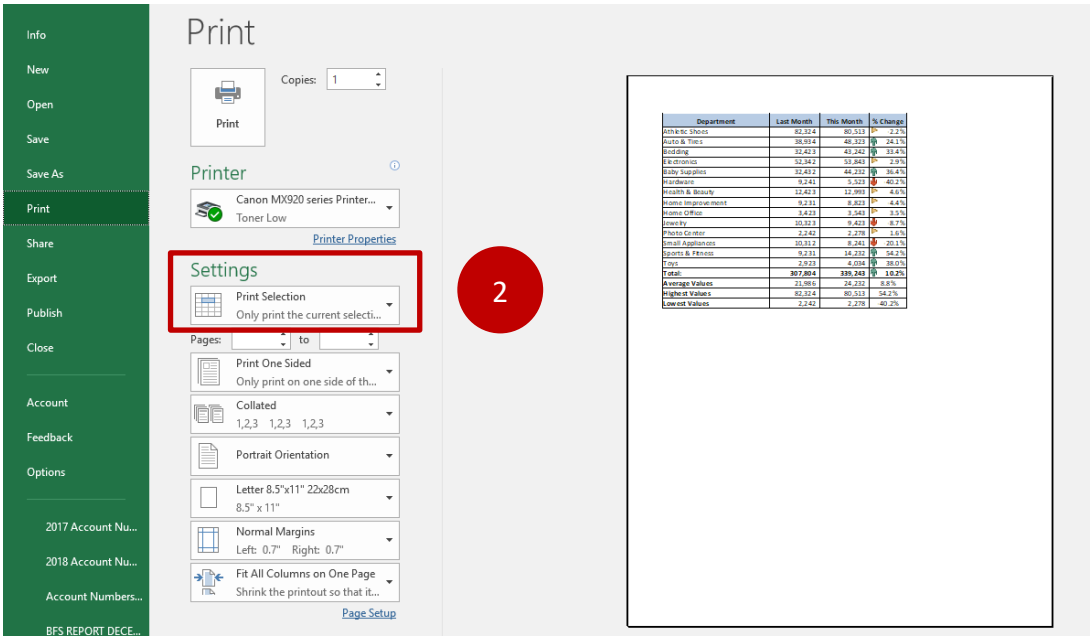
Legend	
Increase greater than 5%	
Change plus or minus 5%	
Decrease greater than 5%	

Department	Last Month	This Month	% Change
Athletic Shoes	82,324	80,513	-2.2%
Auto & Tires	38,934	48,323	24.1%
Bedding	32,423	43,242	33.4%
Electronics	52,342	53,843	2.9%
Baby Supplies	32,432	44,232	36.4%
Hardware	9,241	5,523	-40.2%
Health & Beauty	12,423	12,993	4.6%
Home Improvement	9,231	8,823	-4.4%
Home Office	3,423	3,543	3.5%
Jewelry	10,323	9,423	-8.7%
Photo Center	2,242	2,278	1.6%
Small Appliances	10,312	8,241	-20.1%
Sports & Fitness	9,231	14,232	54.2%
Toys	2,923	4,034	38.0%
Total:	**307,804**	**339,243**	**10.2%**
Average Values	21,986	24,232	8.8%
Highest Values	82,324	80,513	54.2%
Lowest Values	2,242	2,278	-40.2%

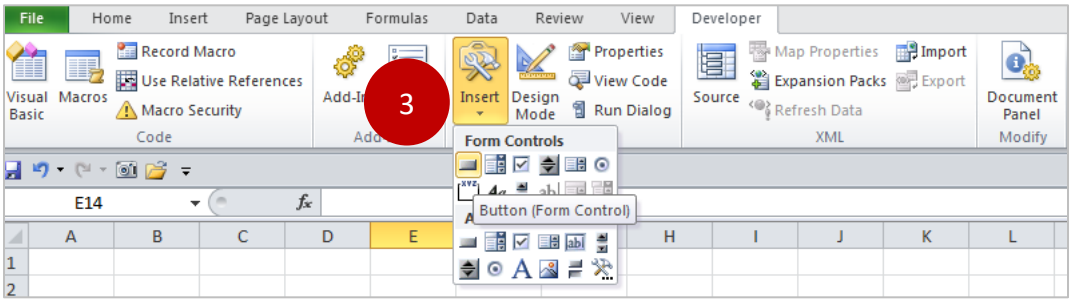
Product Sales Evaluation

Ready

2. Press CTRL+P and choose Print Selection under Settings. Click Print, then click the macro icon on the Status Bar to stop running the macro.

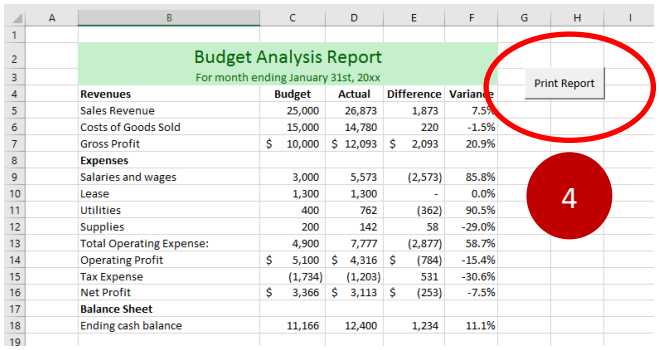


3. Click on the Developer tab, then click on the Button button from the Form Controls group.



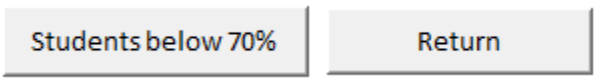
4. Assign a Macro to the button → click OK.

   Change the name of the button by highlighting the current name and typing the new name over it. Click anywhere outside the button.



Revenues	Budget	Actual	Difference	Variance
Sales Revenue	25,000	26,873	1,873	7.5%
Costs of Goods Sold	15,000	14,780	220	-1.5%
Gross Profit	$ 10,000	$ 12,093	$ 2,093	20.9%
Expenses				
Salaries and wages	3,000	5,573	(2,573)	85.8%
Lease	1,300	1,300	-	0.0%
Utilities	400	762	(362)	90.5%
Supplies	200	142	58	-29.0%
Total Operating Expense:	4,900	7,777	(2,877)	58.7%
Operating Profit	$ 5,100	$ 4,316	$ (784)	-15.4%
Tax Expense	(1,734)	(1,203)	531	-30.6%
Net Profit	$ 3,366	$ 3,113	$ (253)	-7.5%
Balance Sheet				
Ending cash balance	11,166	12,400	1,234	11.1%

Multiple Form Control buttons are often used to help users work more efficiently. This worksheet has a macro that creates a filtered report with one click of a button. A second Form Control button was created to clear the filter.



Pre-Calculus Class Performance Summary

Students below 70% | Return

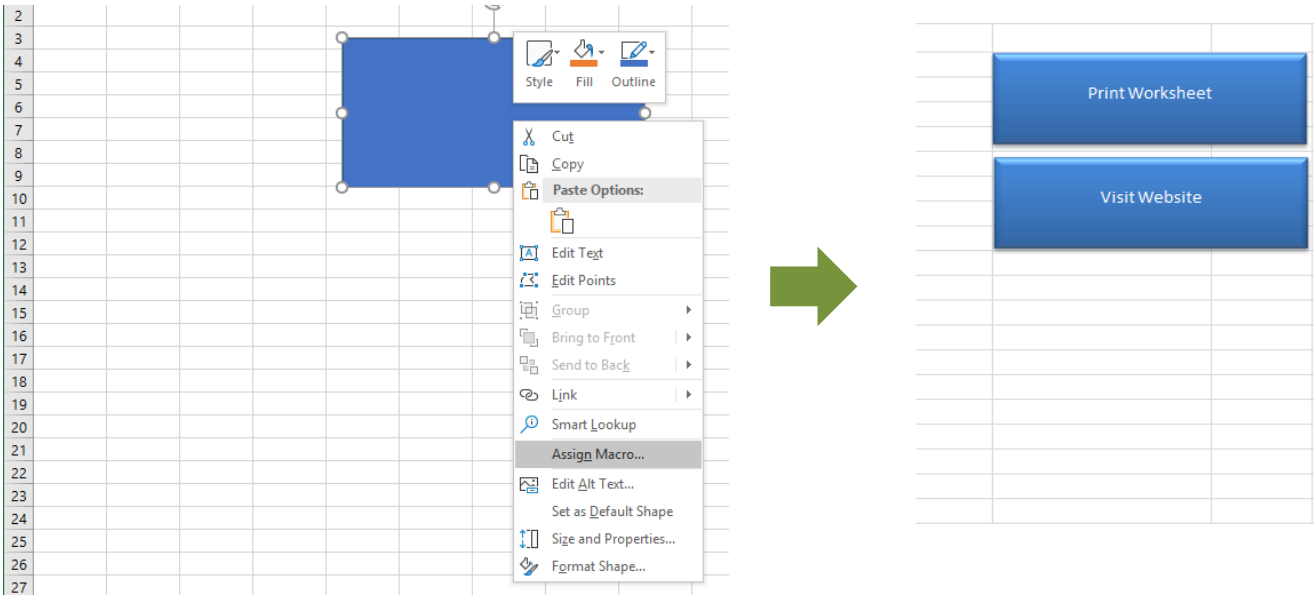
Name	Grade Level	Homework	Quiz	Class Part.	Final Exam	Final Grade
Carpenter, Brian	11th	75.0%	28.0%	40.0%	51.0%	57.3%
Bush, Ronnie	10th	65.0%	72.5%	72.5%	49.0%	64.1%
Smith, Rodney	11th	54.0%	52.0%	58.0%	65.0%	56.2%
Monroe, Charles	10th	49.8%	79.5%	95.0%	84.0%	67.1%
Farmer, Rebecca	10th	49.0%	88.0%	93.0%	91.0%	69.6%
Rowling, Ozzy	10th	61.5%	76.0%	73.0%	59.0%	65.1%
Class Averages		59.0%	66.0%	71.9%	66.5%	76.5%

You can change the name of a Form Control button by highlighting the current name and typing over it, then click anywhere outside the button.

Run a Macro using Shapes

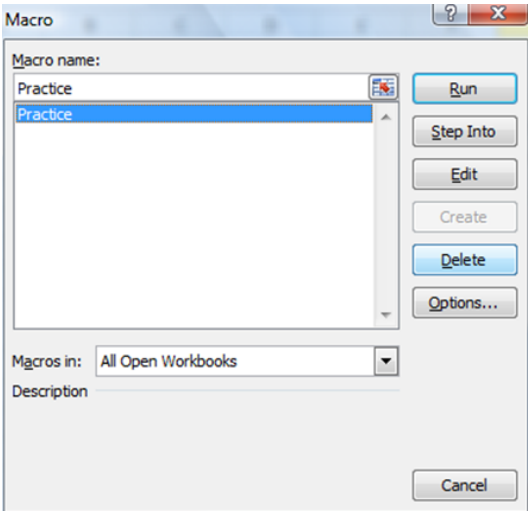
You can also run a macro by inserting a shape and assigning a macro to it. Click on the Insert tab, then click on the Shapes button from the Illustrations group. Choose a shape and use the small cross icon to insert it into the worksheet. Use the Shape Styles options to change its appearance. Right-click on the shape to copy and paste the shape if you want to create additional macros in the worksheet that will use a shape to run them.

Right-click on each shape and choose Edit Text to add names to the macros by typing the words into the shapes. You can also right-click on the shape to assign a hyperlink to a file or a website instead of a macro.



Delete a Macro

1. Use the shortcut key, ALT+F8 or click Developer tab → Code group → Macros button.
2. In the Macro dialog box, choose the macro you want to delete.
3. Click Delete → click Delete again to confirm.

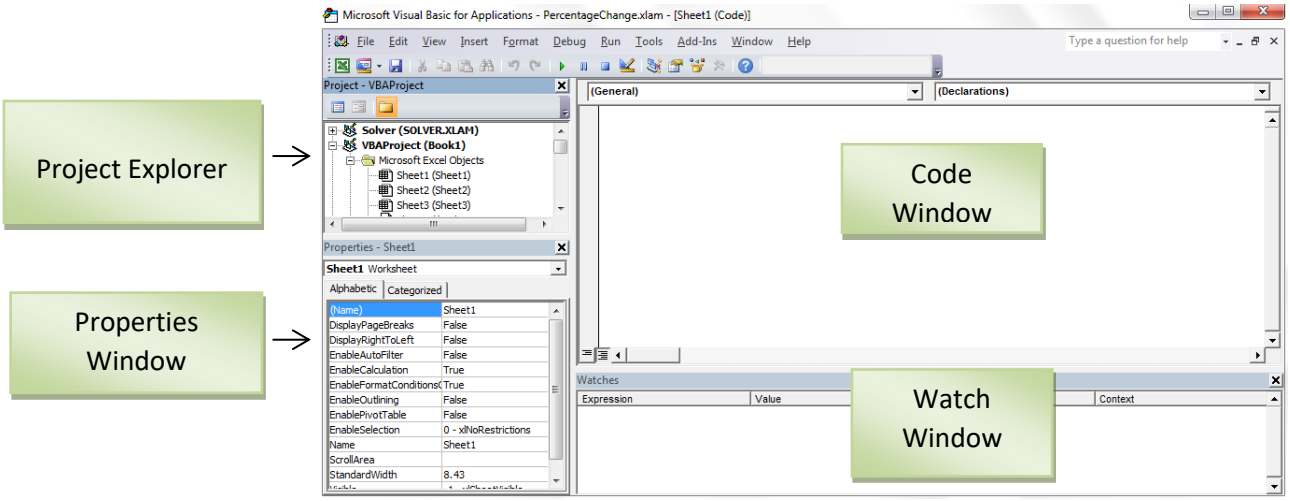


User-Defined Functions

User-defined functions can be created by using Visual Basic for Applications (VBA), which is a programming language within Microsoft Office that will allow you to replace complex formulas that would normally be inputted with **functions.**

Steps to Creating a User-Defined Function:

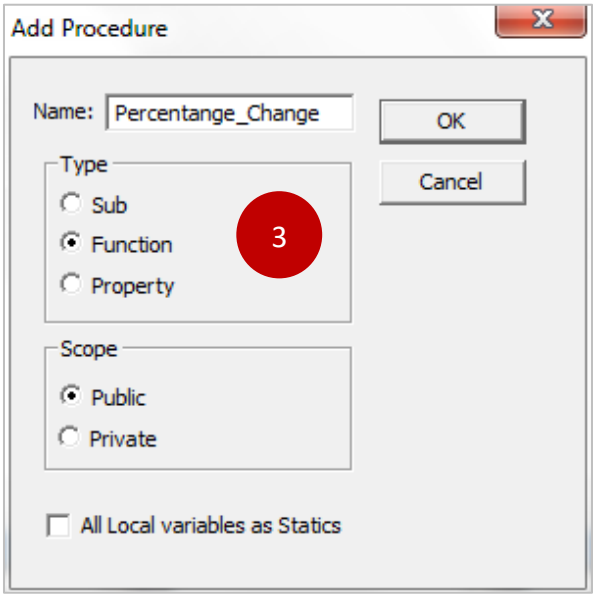
1. Open a blank worksheet and press ALT+F11; the Visual Basic Editor window will appear:



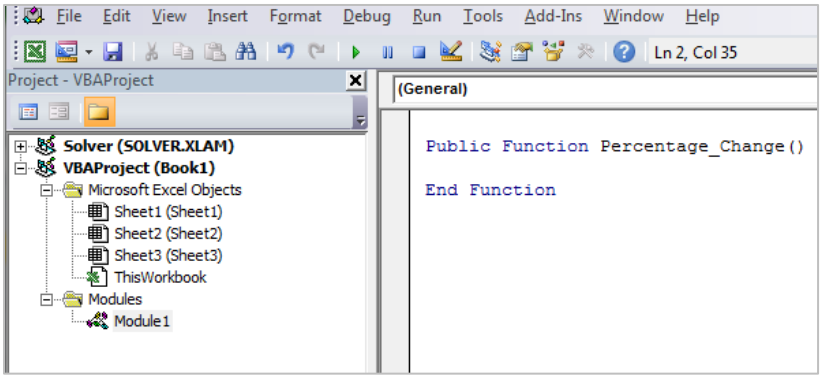
To create a user-defined function, we need the Project Explorer, Code Window, Properties Window and Watch Window to be open. If you do not see the Code Window, click on the View tab and choose Code.

2. In Project Explorer, right-click on VBA Project; choose Insert, Module.
3. Click on the Insert tab and choose Procedure. The Add Procedure dialog box will appear:

The Name box will be the name you create for the function; it cannot have any spaces. The Procedure name can be separated by an underscore or you can use mixed case, such as Percentage_Change. The type will be “Function” and the Scope will be “Public”; press OK.

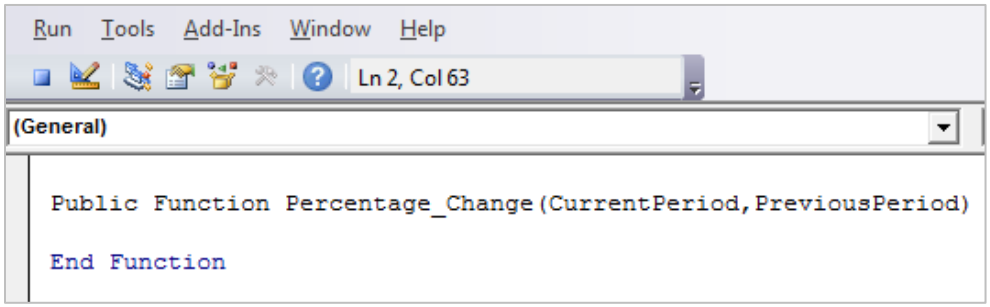


The Code Window will now show the text Public Function, End Function and the Procedure name you assigned, followed by a set of parentheses.

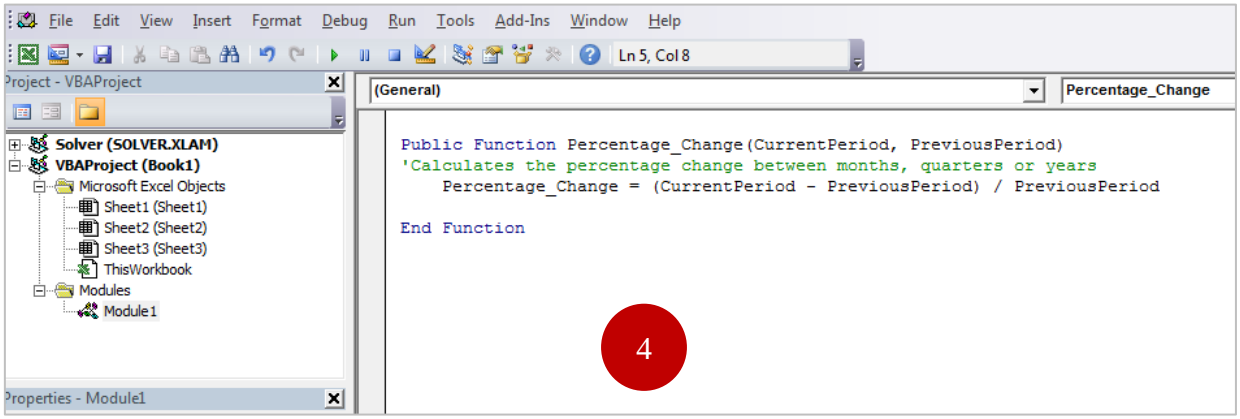


The parentheses provide the space for us to input the function argument names. In this example, we want to compare the difference between this year's sales results to last year. To see the difference as a dollar amount, we would simply subtract this year from last year. To see it as a variance percentage, we have to use this formula: (Current Period – Previous Period) ÷ Previous Period.

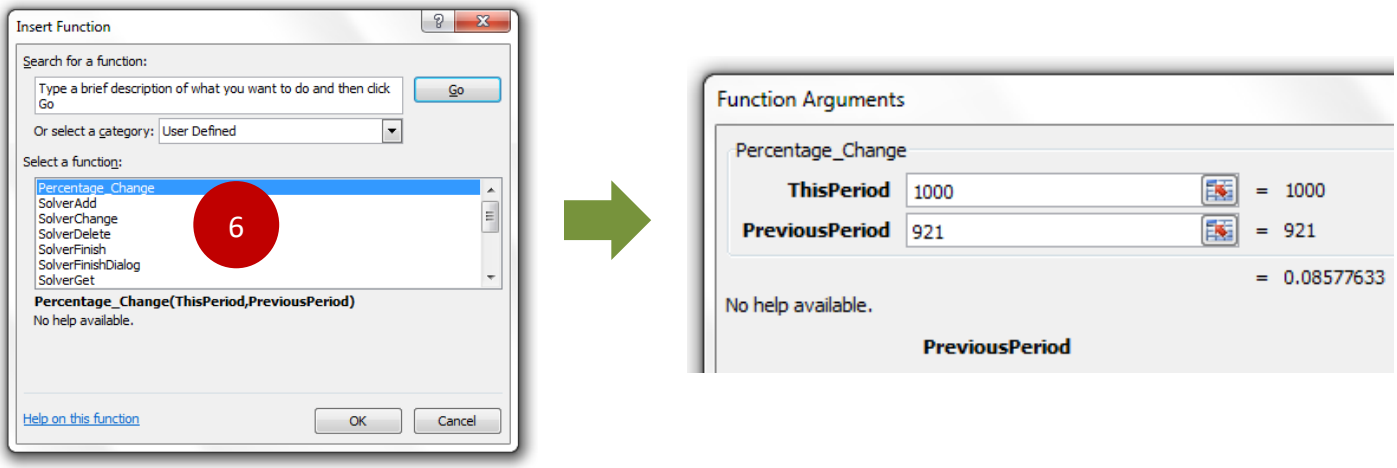
This is what we can use for the function names, so we will input them inside the parentheses:



4. So far, we have the function name and the names of the function arguments. We need to add a description of what's being calculated and the formula, using the names of the function arguments; make sure to add an apostrophe before adding the description.



5. The User-Defined function code is now complete. Press ALT+F11 to return to the worksheet.
6. We can now use the equal sign or the Insert Function dialog box to bring up the user-defined function; let's use the latter by clicking on the Insert Function button. In the Or section, select a category drop-down menu, choose User Defined. Look for the function name that was just created; click OK. The Function Arguments dialog box will appear.

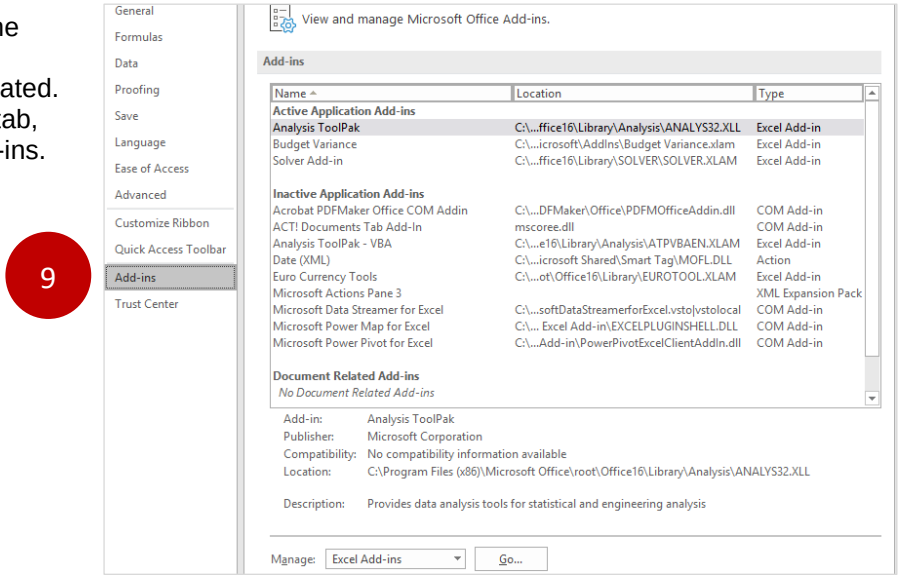


7. The number 1,000 is entered for the first argument and 921 is entered for the second argument, giving us a formula result of .08577633; click OK. As with other numbers in Excel, it can be reformatted as a percentage with one decimal point, which would be 8.5%.

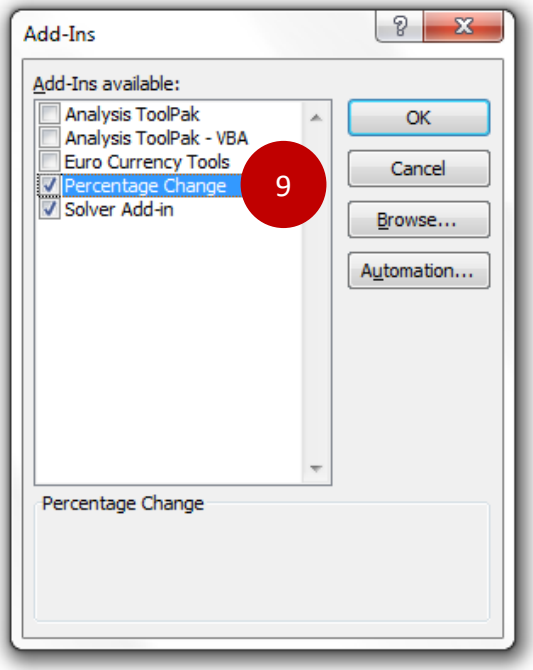
User-defined functions can be saved as an Excel add-in so that they can be used with any workbook and shared with others.

8. Go back to the original worksheet where you created the user-defined function. Click on the file or office button and choose Save As. Under Save as type choose Excel Add-in. Choose a file name, such as "Percentage Change" and save it to a file on the hard drive, a flash drive or the desktop; click Save.

9. To do calculations using the user-defined function, the Excel add-in must be activated. Click on the File or Office tab, choose Options, then Add-ins.



At the bottom of the screen you will see Manage: Excel-Add-ins. Click on the Go button; the Add-Ins dialog box will appear. Use the Browse button to locate the file, then click on it to add it to the Add-Ins Available list. Click OK.



MOS Study Guide: Exam MO-200

The study guide covers five **objective groups:** There is a list of objectives within each group:

Objective Group 1: Manage worksheets and workbooks

1.1 Import data into workbooks
1.2 Navigate within workbooks
1.3 Format worksheets and workbooks
1.4 Customize options and views
1.5 Configure content for collaboration

Objective Group 2: Manage data cells and ranges

2.1 Manipulate data in worksheets
2.2 Format cells and ranges
2.3 Define and reference named ranges
2.4 Summarize data visually

Objective Group 3: Create tables

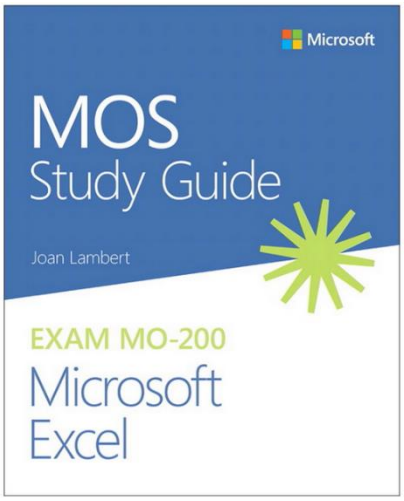
3.1 Create and format tables
3.2 Modify tables
3.3 Filter and sort table data

Objective Group 4: Perform operations by using formulas and functions

4.1 Insert references in formulas
4.2 Calculate and transform data by using functions
4.3 Format and modify text by using functions

Objective Group 5: Manage charts

5.1 Create charts
5.2 Modify charts
5.3 Format charts



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The content of the **MOS 2020 Study Guide** includes the following:

- Description of prerequisites
- Review information
- Practice tasks
- Step-by-step Instructions for how to complete tasks
- Screenshots
- Exam tips and strategies

The Excel practice files needed to compete the practice tasks can be downloaded from this website: https://www.microsoftpressstore.com/store/mos-study-guide-for-microsoft-excel-exam-mo-200-9780136627159

Appendix A: Excel for Small Business

This section will provide you with examples of worksheets that can be created to help manage a small business. A brief explanation is provided for each example without going into detailed explanations regarding the accounting and financial management concepts behind them.

Cash Flow Forecast

How much money will be coming in and out of your business each month? If you bill for services, how long will it take to get paid? A cash flow forecast will help to answer both of those questions. The lack of cash and cash flow is a major cause of business failure, which is why having one is an important part of managing a business.

A cash flow forecast starts with the beginning balance for the month (i.e., the checking account balance). You would then input formulas to do the following calculations:

Beginning Cash Balance	10,000
Add: Cash Collections	9,000
Total Cash Available	19,000
Less: Total Cash Paid Out	(5,070)
Add: Loan Deposits	
Add: Equity Deposits	
Less: Cash Withdraws	(4,000)
Ending Cash Balance	$ 9,930

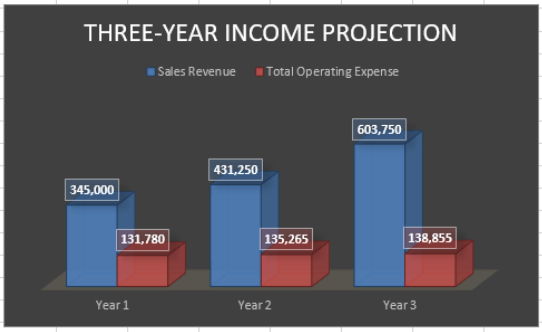
The Ending Cash Balance will then become the beginning cash balance for the next month.

B	C	D	E	F	G	H	I	J	K	L	M	N
					General Contractors USA							
					Cash Flow Forecast							
Fiscal Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Beginning Cash Balance	10,000	9,930	15,860	21,790	27,720	33,650	39,580	45,510	51,440	57,370	63,300	69,230
Sales Revenue	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Cash Collections												
This Month	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
Last Month		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Total Cash Collections	9,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Total Cash Available	**19,000**	**24,930**	**30,860**	**36,790**	**42,720**	**48,650**	**54,580**	**60,510**	**66,440**	**72,370**	**78,300**	**84,230**
Cash Payments												
Lease	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Salaries	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Utilities	400	400	400	400	400	400	400	400	400	400	400	400
Supplies	200	200	200	200	200	200	200	200	200	200	200	200
Credit Card Payments	120	120	120	120	120	120	120	120	120	120	120	120
Misc.	100	100	100	100	100	100	100	100	100	100	100	100
Tax Liabilities												
Federal Income Tax												
State & Local												
Total Cash Paid Out	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**	**5,070**
Loan Deposits												
Equity Deposits												
Cash Withdrawals	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Ending Cash Balance	**$ 9,930**	**$ 15,860**	**$ 21,790**	**$ 27,720**	**$ 33,650**	**$ 39,580**	**$ 45,510**	**$ 51,440**	**$ 57,370**	**$ 63,300**	**$ 69,230**	**$ 75,160**

Three Year Income Projection

Although it's sometimes difficult to predict what will happen in the future, an estimate of financial performance over the next three years is important as it relates to the decisions that a small business owner makes today. What is the projected growth rate? What is our current profit margin? Will our Sales Revenue grow faster than our expenses? A three-year income projection worksheet should be able to answer these questions.

	Three-Year Income Projection			
	Revenues	**Year 1**	**Year 2**	**Year 3**
	Sales Revenue	345,000	431,250	603,750
	Costs of Goods Sold	-189,750	-237,188	-332,063
	Gross Profit	155,250	194,063	271,688
	Fixed Expenses			
	Salaries	80,000	82,400	84,872
	Rent	30,000	30,900	31,827
	Insurance Expense	6,000	6,180	6,365
	Bank Service Expense	180	185	191
	Variable Expenses			
	Advertising	12,000	12,000	12,000
	Shipping Expense	3,600	3,600	3,600
	Total Operating Expense	131,780	135,265	138,855
	Operating Profit	23,470	58,797	132,832
	Less: Income Taxes @ 34%	-7,980	-19,991	-45,163
	Net Profit	15,490	38,806	87,669
	Net Profit %	4.5%	9.0%	14.5%
	Sales Growth Rate		25%	40%



Income Statements

The income statement will report your revenue and expenses at a point in time, typically a month, quarter or a year. It also provides the information needed to calculate financial ratios, which measure the financial health of a business. In this example, we want to evaluate the gross, operational and net income numbers, compared to the sales revenue for the month. An outline was also applied to this worksheet, so that the information could easily be collapsed and expanded.

	Income Statement			
	For Qtr. Ended March 31, 20xx			
+	Gross Profit	45,916	55,090	55,972
+	Operating Profit	29,614	37,941	40,404
+	Net Profit	19,545	25,041	26,667
	Financial Ratios:			
	Gross Profit Margin	42.5%	43.1%	42.2%
	Operating Margin	27.4%	29.7%	30.4%
	Net Profit Margin	18.1%	19.6%	20.1%

	Income Statement			
	For Qtr. Ended March 31, 20xx			
	Revenue	**Jan**	**Feb**	**March**
	Sales Revenue	107,932	127,843	132,698
	Service Revenue	2,743	3,953	2,893
	Costs of Goods Sold	(64,759)	(76,706)	(79,619)
	Gross Profit	45,916	55,090	55,972
	Expenses			
	Salaries and wages	12,834	13,834	12,224
	Lease	2,250	2,250	2,250
	Utilities	543	241	432
	Depreciation Expense	$500	$500	$500
	Supplies	175	324	162
	Total Operating Expense:	16,302	17,149	15,568
	Operating Profit	29,614	37,941	40,404
	Less: Income Taxes	(10,069)	(12,900)	(13,737)
	Net Profit	19,545	25,041	26,667
	Financial Ratios:			
	Gross Profit Margin	42.5%	43.1%	42.2%
	Operating Margin	27.4%	29.7%	30.4%
	Net Profit Margin	18.1%	19.6%	20.1%

Balance Sheets

As with the income statements, the balance sheet can also be used to create financial ratios that measure the financial health of the business as it relates to its assets compared to the amount of liabilities the company has.

Balance Sheet				
For the Month Ended March 31, 20xx				
Current Assets			**Current Liabilities**	
Cash	$ 17,324		Accounts Payable	$ 3,800
Accounts Receivable	$ 9,175		Current Notes Payable	450
Allowance for Doubful Accounts	$ (175)		Total Current Liabilities	4,833
Inventory	$ 2,300		Long Term:	
Prepaid Insurance	$ 1,000		SBA Loan Balance	18,750
Total Current Assets	$ 29,624		Total Liabilities	$ 23,583
Long Term Assets			**Owner's Equity:**	
Trucks	$ 22,922		Retained Earnings	42,255
Office Equipment	13,292			
Total Long-Term Assets	$ 36,214		Owner's Equity	42,255
Total Assets	$ 65,838		Total Liabilities and Owner's Equity	$ 65,838
Financial Ratios				
Cash Ratio	3.6		Debt-to-Equity	0.56
Current Ratio	6.1		Working Capital	$24,791
Quick Ratio	5.7		Debt Ratio	0.36

Owner's Equity Statement

Rob's Discount Furniture			
Owner's Equity Statement			
For the Month Ended March 31, 20xx			
R. Smith Beginning Capital			20,000
Equity Deposits		400	
Net Income		10,000	10,400
			30,400
Less: Owner's Drawings			3,000
Owner's Capital			27,400

This statement gives a summary of the owner's money invested into the company. At the end of each month or quarter, the net income for the month is added to the statement, along with any cash withdraws. A **Partner's Capital Statement** can be used when there is more than one owner.

Rob's Discount Furniture				
Partner's Capital Statement				
For the Month Ended March 31, 20xx	**Rob Smith**	**Bob Jones**	**Total**	
Beginning Capital	20,000	5,000	25,000	
Equity Deposits	400			
Net Income	7,500	2,500	10,000	
	27,900	7,500	35,400	
Less: Owner's Drawings	3,000		3,000	
Owner's Capital	24,900	7,500	32,400	

Accounts Receivable Aging Report

If a company extends credit to its customers, it will want to keep track of how long it takes to receive cash. Money tied up in accounts receivables is not available to pay monthly operating expenses and can cause major problems if it is out of control. An aging report will calculate estimates as to how much money will be converted into cash each month.

	A	B	C	D	E	F	G	H	I
1									
2		**Accounts Receivable Aging Report**		Totals:	Not Yet Due	1 - 30 days due	31-60 days past due	61 - 90 days past due	Over 90 days past due
3		Account balance		$ 10,000	$ 5,000	$ 2,200	$ 1,800	$ 700	$ 300
4		Total % chance of default		n/a	2%	4%	10%	20%	40%
5		Total estimate of bad debt		=SUM(E5:I5)	=E3*E4	=F3*F4	=G3*G4	=H3*H4	=I3*I4

The formulas here will multiply the account balance in each accounts receivable category by the percentage chance of default. The totals are summarized in cell D5.

	A	B	C	D	E	F	G	H	I
1									
2		**Accounts Receivable Aging Report**		Totals:	Not Yet Due	1 - 30 days due	31-60 days past due	61 - 90 days past due	Over 90 days past due
3		Account balance		$ 10,000	$ 5,000	$ 2,200	$ 1,800	$ 700	$ 300
4		Total % chance of default		n/a	2%	4%	10%	20%	40%
5		Total estimate of bad debt		$ 628	$ 100	$ 88	$ 180	$ 140	$ 120

Quarterly Budget Analysis

This report will take the information from an income statement, balance sheet, owner's equity statement and cash flow forecast and use them to do a comparative analysis. How did the company do, compared to what they predicted?

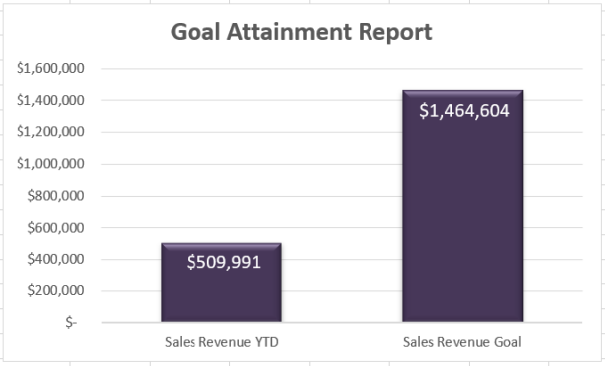
The analysis worksheet is divided into three sections. The first is the comparison based on information from the income statement. the second section, Non-Income Statement items comes from the balance sheet and owner's equity statements. The third section provides a summary of the deviations found in column E.

	A	B	C	D	E
1					
2		**Quarterly Budget Analysis**			
3		**For the Quarter Ending: March 31, 20xx**			
4		**Revenues**	**Budget**	**Actual**	**Deviation**
5		Sales Revenue	$ 367,000	$368,473	1,473
6		Service Revenue	7,500	9,589	2,089
7		Costs of Goods Sold	(220,200)	(221,084)	(884)
8		**Gross Profit**	$ 154,300	$156,978	$ 3,562
9		**Expenses**			
10		Salaries and wages	37,500	38,892	(1,392)
11		Lease	6,750	6,750	-
12		Utilities	1,200	1,216	(16)
13		Supplies	600	661	(61)
14		Total Operating Expense:	46,050	47,519	(1,469)
15		**Operating Profit**	$ 108,250	$109,459	$ 1,209
16		Tax Expense	(36,805)	(36,706)	99
17		**Net Profit**	$ 71,445	$ 72,753	$ 1,308
18					
19		**Non-Income Statement Items**			
20		Ending cash balance	$ 16,537	$ 17,324	$ 787
21		Owner drawings	$ 15,000	$ 12,950	$ 2,050
22					
23		**Budget Deviations**			
24		Income Statement	$ 1,308		
25		Nonincome statement items	$ 2,050		
26		Total deviation	$ 3,358		

Goal Attainment Report

This report looks at monthly sales revenue numbers from an income statement and compares them to a sale revenue goal for the year. The columns in the chart will change dynamically as the values in the chart change. You can also use Goal Seek to run different scenarios but remember that the value in "To set" needs to refer to a cell that has a formula in it. In this example, it would be cell B17 or B19.

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3		**Goal Attainment Report**									
4		**Gross Revenue**									
5		January	117,923								
6		February	127,843								
7		March	132,698								
8		April	131,527								
9		May									
10		June									
11		July									
12		August									
13		September									
14		October									
15		November									
16		December									
17		Sales Revenue YTD	$ 509,991								
18		Sales Revenue Goal	$ 1,464,604								
19		% Achieved	34.8%								



Product Sales Comparisons

A company that sells multiple products or services might benefit from knowing how the current month's sales compare to the previous month. Refer to chapter xx regarding the conditional formatting and how to create a legend.

The Average, High and Low values were calculated using the following functions:

Average values	=AVERAGE (C7:C20)
Highest values	=MAX(C7:C20)
Lowest Values	=MIN(C7:C20)

You can use AutoFill to calculate the remaining cells.

	A	B	C	D	E
1					
2		**East Coast Retail**			
3		**Legend**			
4		Sales increase greater than 5%			
5		Sales change plus or minus 5%			
6		Sales decrease greater than 5%			
7		**Product Category**	**Quarter 1**	**Quarter 2**	**% Change**
8		Athletic Shoes	$ 82,324	$ 80,513	-2.2%
9		Auto & Tires	$ 38,934	$ 48,323	24.1%
10		Bedding	$ 32,423	$ 43,242	33.4%
11		Electronics	$ 52,342	$ 53,843	2.9%
12		Baby Supplies	$ 32,432	$ 44,232	36.4%
13		Hardware	$ 9,241	$ 5,523	-40.2%
14		Health & Beauty	$ 12,423	$ 12,993	4.6%
15		Home Improvement	$ 9,231	$ 8,823	-4.4%
16		Home Office	$ 3,423	$ 3,543	3.5%
17		Jewelry	$ 10,323	$ 9,423	-8.7%
18		Photo Center	$ 2,242	$ 2,278	1.6%
19		Small Appliances	$ 10,312	$ 8,241	-20.1%
20		Sports & Fitness	$ 9,231	$ 14,232	54.2%
21		Toys	$ 2,923	$ 4,034	38.0%
22		**Total:**	**$ 307,804**	**$ 339,243**	**10.2%**
23		**Average Values**	$ 21,986	$ 24,232	8.8%
24		**Highest Values**	$ 82,324	$ 80,513	54.2%
25		**Lowest Values**	$ 2,242	$ 2,278	-40.2%

Annual Sales Evaluation

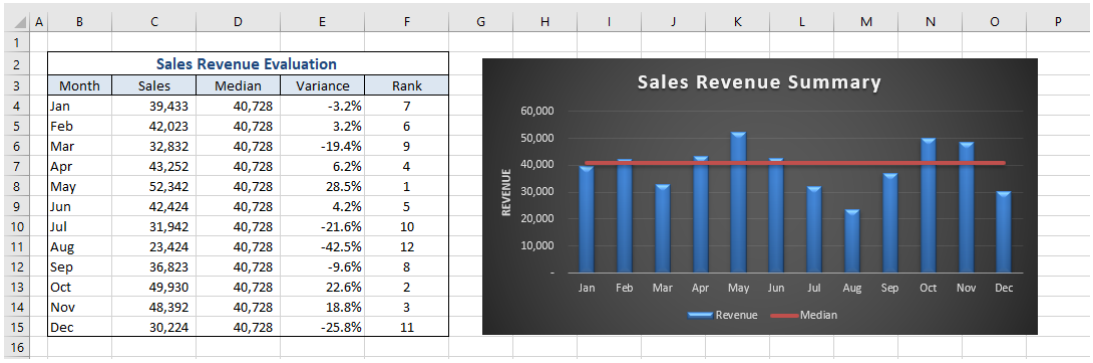
This report will summarize monthly sales data and help to identify trends during the year. A comparison between each month's revenue and the median revenue number for the year can be done by calculating the variance as a percentage, which would be (Sales – Median) ÷ Median, as opposed to one number from another.

	A	B	C	D	E	F
1						
2		Sales Revenue Evaluation				
3		Month	Sales	Median	Variance	Rank
4		Jan	39,433	40,728	-3.2%	7
5		Feb	42,023	40,728	3.2%	6
6		Mar	32,832	40,728	-19.4%	9
7		Apr	43,252	40,728	6.2%	4
8		May	52,342	40,728	28.5%	1
9		Jun	42,424	40,728	4.2%	5
10		Jul	31,942	40,728	-21.6%	10
11		Aug	23,424	40,728	-42.5%	12
12		Sep	36,823	40,728	-9.6%	8
13		Oct	49,930	40,728	22.6%	2
14		Nov	48,392	40,728	18.8%	3
15		Dec	30,224	40,728	-25.8%	11

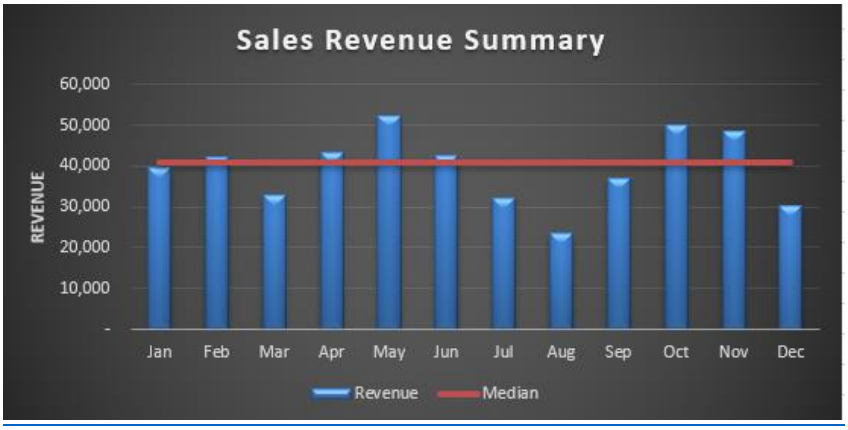
This worksheet has three columns that need calculations. The Median column uses the MEDIAN function, the variance has a formula calculation and the Rank column uses the RANK.AVG calculation.

	A	B	C	D	E	F
1						
2		Month	Sales	Median	Variance	Rank
3		Jan	39433	=MEDIAN($C$3:$C$14)	=(C3-D3)/D3	=RANK.AVG(C3,$C$3:$C$14)
4		Feb	42023	=MEDIAN($C$3:$C$14)	=(C4-D4)/D4	=RANK.AVG(C4,$C$3:$C$14)
5		Mar	32832	=MEDIAN($C$3:$C$14)	=(C5-D5)/D5	=RANK.AVG(C5,$C$3:$C$14)
6		Apr	43252	=MEDIAN($C$3:$C$14)	=(C6-D6)/D6	=RANK.AVG(C6,$C$3:$C$14)
7		May	52342	=MEDIAN($C$3:$C$14)	=(C7-D7)/D7	=RANK.AVG(C7,$C$3:$C$14)
8		Jun	42424	=MEDIAN($C$3:$C$14)	=(C8-D8)/D8	=RANK.AVG(C8,$C$3:$C$14)
9		Jul	31942	=MEDIAN($C$3:$C$14)	=(C9-D9)/D9	=RANK.AVG(C9,$C$3:$C$14)
10		Aug	23424	=MEDIAN($C$3:$C$14)	=(C10-D10)/D10	=RANK.AVG(C10,$C$3:$C$14)
11		Sep	36823	=MEDIAN($C$3:$C$14)	=(C11-D11)/D11	=RANK.AVG(C11,$C$3:$C$14)
12		Oct	49930	=MEDIAN($C$3:$C$14)	=(C12-D12)/D12	=RANK.AVG(C12,$C$3:$C$14)
13		Nov	48392	=MEDIAN($C$3:$C$14)	=(C13-D13)/D13	=RANK.AVG(C13,$C$3:$C$14)
14		Dec	30224	=MEDIAN($C$3:$C$14)	=(C14-D14)/D14	=RANK.AVG(C14,$C$3:$C$14)

The Sales Revenue Evaluation data can also be displayed by creating a combination chart:

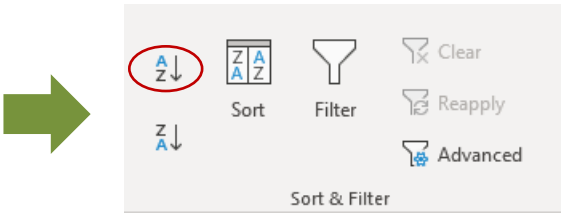


By creating this type of chart, you can identify the high and low trends during the year. Are the low sales months in July and August typical, or should the company expect this every year? Where the high sales months in May and October due to an aggressive marketing campaign?

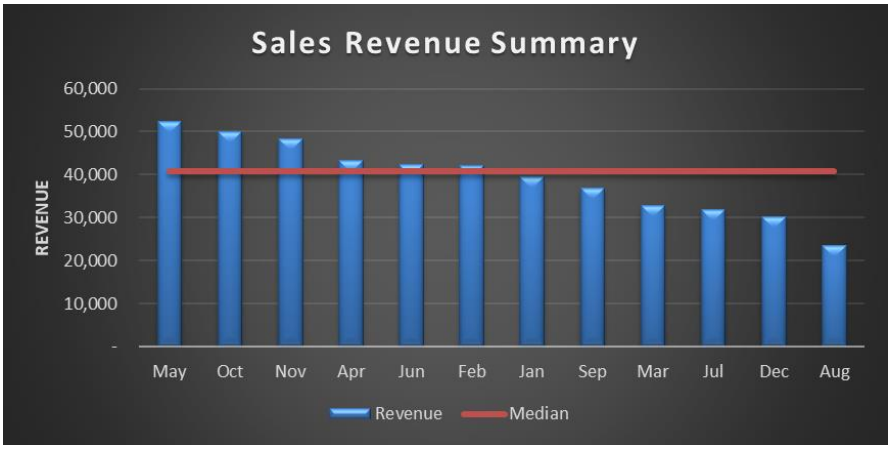


You can click on the Rank column heading (cell F3), then click on the A-Z button in the Sort & Filter group to rank the Month column from to change way the data is displayed and rank the months of the year from highest to lowest…

	A	B	C	D	E	F
1						
2		Sales Revenue Evaluation				
3		Month	Sales	Median	Variance	Rank
4		May	52,342	40,728	28.5%	1
5		Oct	49,930	40,728	22.6%	2
6		Nov	48,392	40,728	18.8%	3
7		Apr	43,252	40,728	6.2%	4
8		Jun	42,424	40,728	4.2%	5
9		Feb	42,023	40,728	3.2%	6
10		Jan	39,433	40,728	-3.2%	7
11		Sep	36,823	40,728	-9.6%	8
12		Mar	32,832	40,728	-19.4%	9
13		Jul	31,942	40,728	-21.6%	10
14		Dec	30,224	40,728	-25.8%	11
15		Aug	23,424	40,728	-42.5%	12



…and this change will also be reflected in the chart:



Case Study: Cost-Volume-Profit Analysis

East Coast Software Solutions is a fictitious start-up company that used a combination of personal savings, family contributions and a second mortgage to fund the business. The owners found a building with reasonable monthly lease payment and worked out good deal with a wholesale company to supply them with the products they will buy and resell at a profit.

East Coast Software Solutions wants to know how many of the customized software packages they will need to sell each month in order to pay their monthly expenses. To do this, they will need to calculate their break-even point, which can be **described as the point at which the money coming in (revenue) is equal to the money going out (expenses).** To do this, they will need to input the following numbers into a worksheet

- Sale Price per Unit
- Cost per Unit
- Total Monthly Fixed Costs

Let's open a new spreadsheet and type in the following information:

	A	B	C	D	E	F	G
1							
2		Cost-Volume-Profit Analysis					
3		**Number of Units**	**1**	**20**	**30**	**40**	
4		Sales Revenue					
5		Variable Costs					
6		Contribution Margin					
7		Fixed Costs					
8		Operating Income					
9		Contribution Margin %					
10		Breakeven in units					
11		Breakeven revenues					
12							

Enter the following inputs:

C4 = $400
C5 = $250
C7 = $3,000

The first calculation will be the **contribution margin,** which is simply the sale price per unit less the cost per unit, so input C4-C5 into cell C6, which gives you a result of $150.

Now we are ready to determine the break-even number **in units**. To calculate this number, we need to divide the **Fixed Costs** by the **Contribution Margin.** Click on cell C11 and input =C7/C6, giving you a result of 20.

The worksheet should now look like this:

	A	B	C	D	E	F	G
1							
2		Cost-Volume-Profit Analysis					
3		**Number of Units**	**1**	**20**	**30**	**40**	
4		Sales Revenue	400				
5		Cost per Unit	250				
6		Contribution Margin	150				
7		Fixed Costs	3,000				
8		Operating Income					
9		Contribution Margin %					
10		Breakeven in units	20				
11		Breakeven revenues					
12							

East Coast Software Solutions knows that it will need to sell at least 20 units per month to reach its break-even point. They also want to know what their break-even point will be in terms of revenue. Let's first calculate the Contribution Margin percentage, which the contribution margin divided by the sales revenue in units, so in cell C9 type =C6/C9, giving you a result of 37.5%.

The second calculation will be to divide the fixed costs by the contribution margin. In cell C11 type =C7/C9, resulting in a break-even revenue amount of $8,000. Your worksheet should now look like this:

	A	B	C	D	E	F	G
1							
2		Cost-Volume-Profit Analysis					
3		**Number of Units**	**1**	**20**	**30**	**40**	
4		Sales Revenue	400				
5		Cost per Unit	250				
6		Contribution Margin	150				
7		Fixed Costs	3,000				
8		Operating Income					
9		Contribution Margin %	37.5%				
10		Breakeven in units	20				
11		Breakeven revenues	$ 8,000				
12							

This is just a starting point. Since most (if not all) businesses are in business to make a profit, we can create some scenarios and get an idea of how much operating income is generated at different sales revenue amounts; this is referred to as **What-If Analysis.**

Let's first determine what the operating income would be for each sales revenue amount by subtracting the fixed costs by the contribution margin. In cell C8, input =C6-C7, which will give you a result of -2,850. In cell D4 type =C4*D3, resulting in a sales revenue amount of 8,000.

Let's now AutoFill the rest of the cells.

1. Select cell C4 and change it to an **Absolute Reference.** To do this you would move the flashing curser in front of the C4 in the formula bar and change it by pressing the F4 key.

2. You can now move the mouse pointer to the lower left-hand corner of cell D4 and drag it across to cells E4 and F4. By using an Absolute Reference, you created a calculation where the dollar amount of $400 is consistently multiplied by the amounts in cells D4, E4 and F4.

3. Select cell C5, change to an absolute reference and fill in the values for rows D5 to F5.

4. Select cell C6. Move the cursor to the lower left corner until you see the solid black cross; auto-fill cells D6 to cell F6. Repeat these steps starting with the values in cells C7 and C8. Make sure you do not try to auto-fill both cells at the same time or you will come up with the wrong answers

Your completed worksheet should now look like this:

	A	B	C	D	E	F	G
1							
2		Cost-Volume-Profit Analysis					
3		**Number of Units**	**1**	**20**	**30**	**40**	
4		Sales Revenue	400	8,000	12,000	16,000	
5		Cost per Unit	250	5,000	7,500	10,000	
6		Contribution Margin	150	3,000	4,500	6,000	
7		Fixed Costs	3,000	3,000	3,000	3,000	
8		Operating Income	-2,850	0	1,500	3,000	
9		Contribution Margin %	37.5%				
10		Breakeven in units	20				
11		Breakeven revenues	$ 8,000				
12							

Since the worksheet will perform all the calculations automatically it will be easy to experiment with different scenarios.

Margin of Safety

Being able to clearly understand sales projections is critical to making decisions about advertising, hiring new employees and a multitude of other decisions about operating a business. The **margin of safety** is a way of showing the difference between forecast numbers break-even numbers. For example, East Coast Software Solutions estimates that it will be able to sell 32 units in July. They estimate that August will be a slow month, only being able to sell about 21 units but business will pick up again in September and will be able to sell about 38 units.

Going back to our original example, we can add some more calculations to come up with three different ways of explaining margin of safety calculations:

1. Sale Revenue – Break-even dollars = Margin of Safety in Dollars
2. Number of units Sold – Break-even units = Margin of Safety in Units
3. Margin of Safety in Dollars ÷ Sales Revenue = Margin of Safety as a Percentage

Let's go back to the original spreadsheet and make some changes. In cell D3 enter 32, E3 enter 21 and F3 enter 38.

We can now add some row labels to cells B12 to B15 and make changes to the formatting, so that it now looks like this:

	A	B	C	D	E	F	G
1							
2		**Cost-Volume-Profit Analysis**					
3		**Number of Units**	**1**	**32**	**21**	**38**	
4		Sales Revenue	400	12,800	8,400	15,200	
5		Cost per Unit	250	8,000	5,250	9,500	
6		Contribution Margin	150	4,800	3,150	5,700	
7		Fixed Costs	3,000	3,000	3,000	3,000	
8		Operating Income	-2,850	1,800	150	2,700	
9		Contribution Margin %	37.5%				
10		Breakeven in units	20				
11		Breakeven revenues	$ 8,000				
12		**Margin of Safety**					
13		Dollars					
14		Units					
15		Percentage					
16							

Enter the margin of safety calculations:

In D13, enter =D4-$C$11; press Enter then AutoFill across to F13

In D14, enter =D3-$C$10; press Enter then AutoFill across to F14

In D15, enter =C13/D4; press Enter then AutoFill across to F15

The worksheet should now look like this:

	A	B	C	D	E	F	G
1							
2		**Cost-Volume-Profit Analysis**					
3		**Number of Units**	**1**	**32**	**22**	**38**	
4		Sales Revenue	400	12,800	8,800	15,200	
5		Cost per Unit	250	8,000	5,500	9,500	
6		Contribution Margin	150	4,800	3,300	5,700	
7		Fixed Costs	3,000	3,000	3,000	3,000	
8		Operating Income	-2,850	1,800	300	2,700	
9		Contribution Margin %	37.5%				
10		Breakeven in units	20				
11		Breakeven revenues	$ 8,000				
12		**Margin of Safety**					
13		Dollars		$ 4,800	$ 800	$ 7,200	
14		Units		12	2	18	
15		Percentage		38%	9%	47%	
16							

Create a Profit Volume Graph

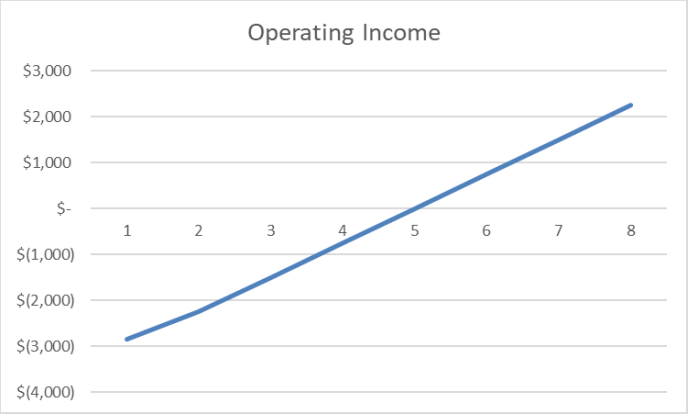
You may find it useful to create a visual that communicates your break-even and target profit analysis information to other employees, potential lenders and business partners. The profit volume graph allows you to show a quadrant that illustrates profit, loss and break-even points.

Let's start a new worksheet that provides more information but only includes the details regarding revenue and expenses. Enter information into the worksheet as follows. We don't have to worry about the calculations since our focus this time is going to be on creating the chart,

	A	B	C	D	E	F	G	H	I	J
1										
2		Profit-Volume Analysis								
3		**Number of Units Sold**	**1**	**5**	**10**	**15**	**20**	**25**	**30**	**35**
4		Sales Revenue	400	2,000	4,000	6,000	8,000	10,000	12,000	14,000
5		Variable Costs	250	1,250	2,500	3,750	5,000	6,250	7,500	8,750
6		Contribution Margin	150	750	1,500	2,250	3,000	3,750	4,500	5,250
7		Fixed Costs	3,000	3,000	3,000	3,000	3,000	3,001	3,002	3,003
8		Operating Income	(2,850)	(2,250)	(1,500)	(750)	0	749	1,498	2,247
9		Tax @ 34%						(255)	(509)	(764)
10		Net Income						494	989	1,483
11										

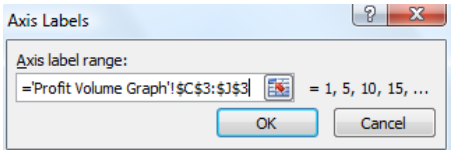
Use the following steps to create the profit volume graph:

1. Select cells B3 to J3. **Hold down** the CTRL key and select cells B8 to J8.
2. Go to Insert tab, Charts group and choose Line chart. Choose the first option, 2D.



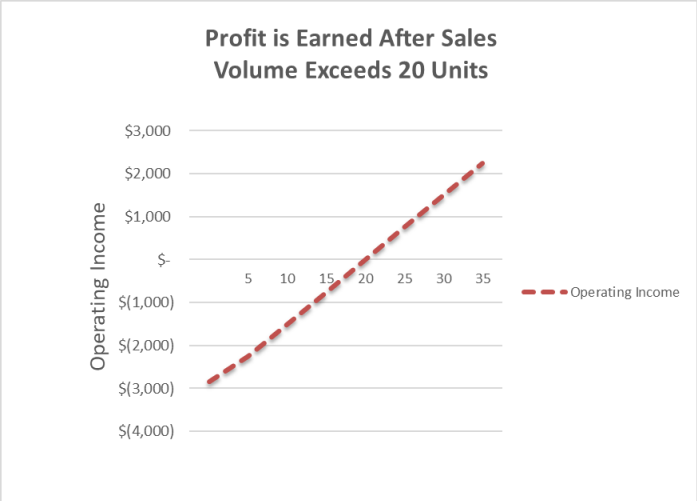
Some adjustments will be needed to make the chart easier to understand:

1. Right click on the chart and choose Select Data
2. Click on the Edit button under Horizontal (Category) Axis Labels



3. Under the Axis label range choose cells C3 through J3; click OK

You will now see that the vertical line in the middle accurately reflects the number of units sold. You can also make the chart more descriptive by changing the chart title and adding a Vertical Axis title.



Appendix B: Excel and Personal Finances

This section gives an overview of worksheets that can be created to evaluate and make decisions about investing, borrowing money and major purchase decisions.

Auto Purchase Decisions

There are generally three financial factors that are considered when purchasing a car; the monthly payment, the length of time the loan is taken out and the interest rate. The financial functions in Excel are either used alone or in combination with other operators. You can input them once and then input different values or use Goal Seek to experiment with different scenarios.

	A	B	C	D	E	F	G
1			Auto Purchase Decisions				
2		PMT	Loan Amount	$ 15,000			
3			Interest Rate	9%			
4			Number of Payments	60			
5			Monthly Payment		=PMT(C3/12,C4,C2)		
6							
7		NPER	Loan Amount	$ 22,000			
8			Interest Rate	9%			
9			Number of Payments		=NPER(C8/12,C10,C7)		
10			Monthly Payment	($425.00)			
11							
12		RATE	Loan Amount	$ 20,000			
13			Interest Rate		=RATE(D14*12,D15,D12)*12		
14			Length of Loan	5 years			
15			Monthly Payment	($400.00)			

Here's an example of how a worksheet can be created to find the best scenario that will fit into a monthly budget. The inputs would produce the results in the shaded cells. Remember to use Goal Seek to change the loan to change the outcomes based on the cell that has the formula in it.

	A	B	C	D
1		Auto Purchase Decisions		
2		PMT	Loan Amount	$ 15,000
3			Interest Rate	9%
4			Number of Payments	60
5			Monthly Payment	($311.38)
6				
7		NPER	Loan Amount	$ 22,500
8			Interest Rate	9%
9			Number of Payments	68
10			Monthly Payment	($425.00)
11				
12		RATE	Loan Amount	$ 20,000
13			Interest Rate	7.4%
14			Length of Loan	5 years
15			Monthly Payment	($400.00)

New Home Purchase

In this worksheet we will calculate both the monthly payment and the amount of annual income required to make the house affordable. The 28% rule is a standard that says that your monthly mortgage payment should be no more than 28% of your monthly gross income.

	A	B	C	D	E	F
1						
2		New Home Calculator				
3						
4		Home Sale Price:	$ 220,000		Interest Rate	5.5%
5		10% Incentive Discount	22,000		Type of Mortgage:	30 Year Fixed
6		Total Purchase Price:	$ 198,000		Number of Payments:	360
7		**Cash Investment Summary:**			Mortgage Value	$158,400
8		20% Down Payment	$ 39,600		Monthly Payments:	($899.38)
9		Cost to Purchase	5,952			
10		Repairs or Improvements	1,000			
11		Cash Investment Required:	46,552		Annual Gross	$38,544.76
12		Mortgage Amount Required:	$ 158,400		Income Required:	

This worksheet uses a combination of custom formats, logical functions and financial functions:

	A	B	C	D	E	F	G	H
1								
2		**New Home Calculator**						
3								
4		Home Sale Price:	$220,000		Interest Rate	5.5%		
5		10% Incentive Discount	=C4*B5		Type of Mortgage:	30 Year Fixed		
6		Total Purchase Price:	=C4-C5		Number of Payments:	=IF(F5=30,360,IF(F5=15,240,IF(F5=40,480,"")))		
7		**Cash Investment Summary:**			Mortgage Value	=C12		
8		20% Down Payment	=C6*B8		Monthly Payments:	=PMT(F4/12,F6,F7)		
9		Cost to Purchase	5,952					
10		Repairs or Improvements	1,000					
11		Cash Investment Required:	=SUM(C8:C10)		Annual Gross	=(-F8/0.28)*12		
12		Mortgage Amount Required:	$158,400		Income Required:			

Debt-to-Income Ratio

This worksheet measures the amount of monthly income compared to the total amount of the monthly payments towards revolving debt and installment loans. An acceptable debt-to-income ratio should not be higher than 30%.

	A	B	C	D	E	F
1						
2		**Debt-to-Income Ratio**				
3						
4		**Monthly Debt Payments**			**Monthly Income**	
5		Monthly mortgage payment	$ 1,750		Salaries	$ 8,169
6		Monthly car payments	624		Overtime and bonuses	300
7		Department store credit cards	120			
8		Credit card minimums x 2	160			
10		**Total Monthly Debt Payments:**	$ 2,654		**Total Monthly Income:**	$ 8,469
11						
12		**Debt-to-Income Ratio:**	**31.3%**			

Monthly Budget

In this personal budget notice that the charitable giving, before tax investing and after-tax investing are all accounted for prior to the net spendable income amount being calculated. This will help to make sure that tax savings and investment goals stay on track.

	A	B	C	D	E	F
1						
2		**Personal Finance Monthly Budget**				
3		**Fixed Expenses:**			**Income:**	
4		Mortgage Payments	$ 2,250		Salary 1	$ 5,440
5		Auto 1	325		Salary 2	2,524
6		Auto 2	425		Owner drawings from business	2,000
7		Utilities	25		Rental property income	345
8		Medical and Dental Expenses	140		Less: 401K Plans	(996)
9		Groceries	475		**Gross Income:**	$ 9,313
10		Cell phone 1	45		Taxes and deductions	(3,166)
11		Cell phone 2	60		**Net Income:**	$ 6,146
12		Gas	355		Less: Charity contribution	(615)
13		**Flexible Expenses:**			Less: Saving account deposit	(300)
14		Personal allowances	200		Less: Investment account deposit	(250)
15		Dining out	100			
16		Clothing	100			
17		**Total Expenses:**	**$ 4,500**		**Net Spendable Income:**	**$ 4,982**
18		**Surplus/Deficit:**	**$ 482**			

Personal Balance Sheet

This worksheet will provide a summary of assets, liabilities and net worth. It is an important tool for goal setting, so that things such as excessive debt or lack of monetary assets can be addressed.

	A	B	C	D	E	F
1		Personal Finance Balance Sheet				
2		Assets			Liabilities	
3		**Monetary Assets**			**Current Liabilities**	
4		Checking	14,233		Utilities	350
5		Savings	1,872		Credit Cards	4,610
6		Money market funds	1,100		Total current liabilities	4,960
7		Total monetary assets	17,205		**Housing Loans**	
8		**Investments**			First mortgage	211,932
9		Mutual Funds	5,600		Home equity line of credit	9,000
10		Investment property	22,000		Total housing loans	220,932
11		Real estate investment trusts	5,430		**Auto Loans**	
12		Total investments	33,030		Auto 1	10,223
13		**Retirement Plans**			Auto 2	19,023
14		401K	139,995		Total auto loans	29,246
15		Roth IRA	74,323		**Other Debt**	
16		Total retirement plans	214,318		College loans	4,000
17		**Primary Residence**	302,324		Installment loans	1,000
18		**Automobiles**			Total other debt	5,000
19		Auto 1	18,243		Net worth	
20		Auto 2	22,032		Total Assets	575,377
21		Total Automobiles	40,275		Total Liabilities	260,138
22		Personal Property	8,500		**Net Worth**	**315,239**

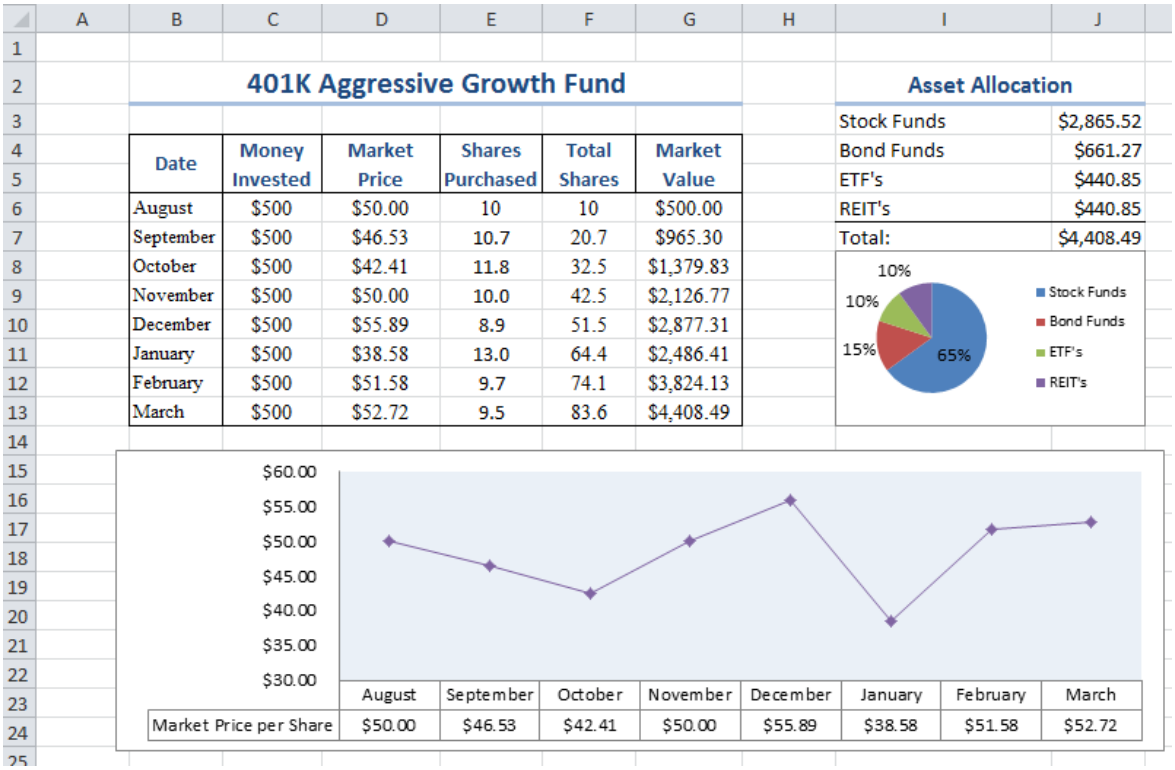
Personal Income Statement

Although it looks like a monthly budget, a personal finance income statement looks at income and expenses on an annual basis by taking the monthly budget amounts and multiplying them by twelve. Is there enough income for vacations or unexpected expenses? Will saving and investment goals be achieved? It will give you a “big picture” view of where you are and what, if any changes need to be made regarding career decisions, cutting expenses or increasing income.

	A	B	C
1		Personal Finance Income Statement	
2		Income	
3		Wages and salaries	112,897
4		Owner drawings from business	12,032
5		Investment property income	4,140
6		Total Gross Income	129,069
7		Tax Liabilities	
8		Federal Income and Social Security	43,884
9		State Tax	9,035
10		Total Income Tax	52,918
11		After-tax Income Available	76,151
12		Expenses	
13		Mortgage Payments	26,400
14		Auto 1	4,800
15		Auto 2	3,588
16		Utilities	10,380
17		Medical and Dental Expenses	4,260
18		Groceries	4,800
19		Cell phone 1	540
20		Cell phone 2	720
21		Gas	2,040
22		Personal allowances	2,400
23		Dining out	1,200
24		Clothing	1,200
25		Total Expenses:	62,328
26		Income Available for Saving and Investing	13,823

Investment Performance

At the end of each month, the dollar amount per share of a stock or mutual fund can be recorded in order to track the investment's performance over time. Trends can be identified and decisions about buying, selling or changing the asset allocation can be made.



401K Aggressive Growth Fund

Date	Money Invested	Market Price	Shares Purchased	Total Shares	Market Value
August	$500	$50.00	10	10	$500.00
September	$500	$46.53	10.7	20.7	$965.30
October	$500	$42.41	11.8	32.5	$1,379.83
November	$500	$50.00	10.0	42.5	$2,126.77
December	$500	$55.89	8.9	51.5	$2,877.31
January	$500	$38.58	13.0	64.4	$2,486.41
February	$500	$51.58	9.7	74.1	$3,824.13
March	$500	$52.72	9.5	83.6	$4,408.49

Asset Allocation

Stock Funds	$2,865.52
Bond Funds	$661.27
ETF's	$440.85
REIT's	$440.85
Total:	$4,408.49

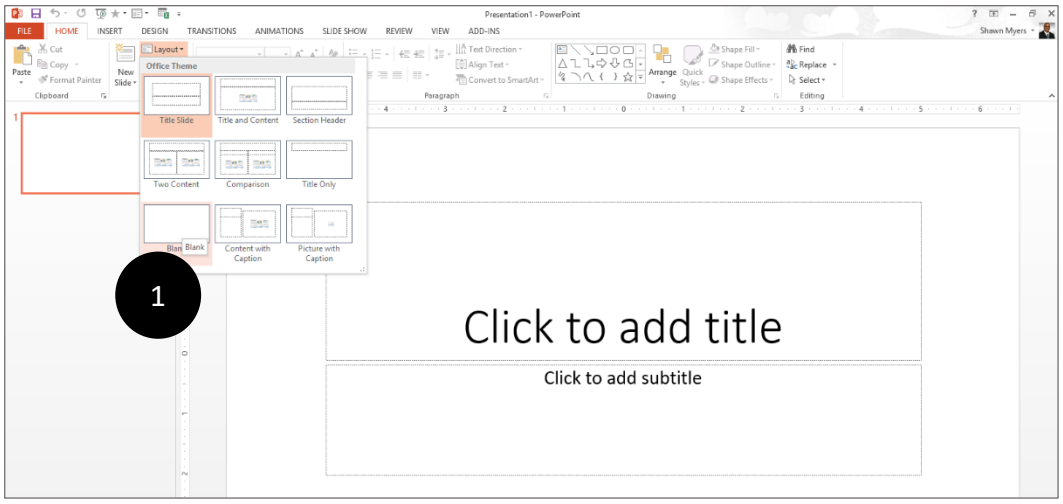
PowerPoint Fundamentals

Topics Covered

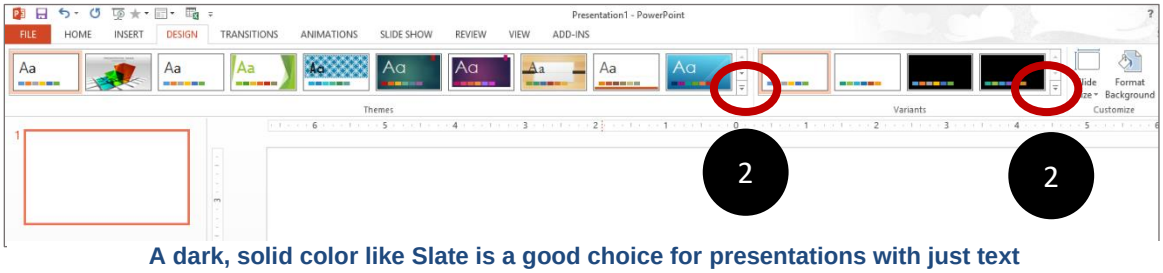
- Designs and Layouts
- Insert Text Boxes
- Insert and Design Tables
- SmartArt Graphics and Shapes
- Create Charts and Apply Animations
- Pictures and Screenshots
- Motion Path Animations
- Doing the Slide Presentation

Lesson 1: Designs and Layouts

1. Open PowerPoint. From the Home tab, click on the Layout button from the Slides group; choose Blank.



2. From the Design tab, choose Slate from the Themes group. Then choose Green Yellow from the Variant group.



A dark, solid color like Slate is a good choice for presentations with just text

3. Click on the Home tab, then click on the Layout button from the Slides group and choose Two Content.

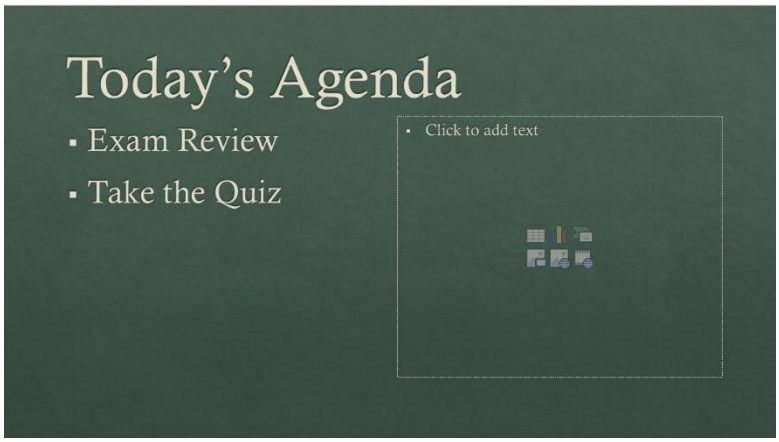
4. Go to the Title text box and type “Today’s Agenda”. Press CTRL+A to select the text; from the Home tab, change the font size to 72.

5. Click on the left side of the text, then press CTRL+L to align the text to the left side of the text box.

6. Click inside the text box on the left, next to the bullet. With the Home tab selected, click on the Bullets down arrow and choose Filled Square bullets; from the Paragraph group choose a 40 Font size.

7. Type the words “Exam Review”; press the Enter key to move to the next bullet; type the words “Take the Quiz”.

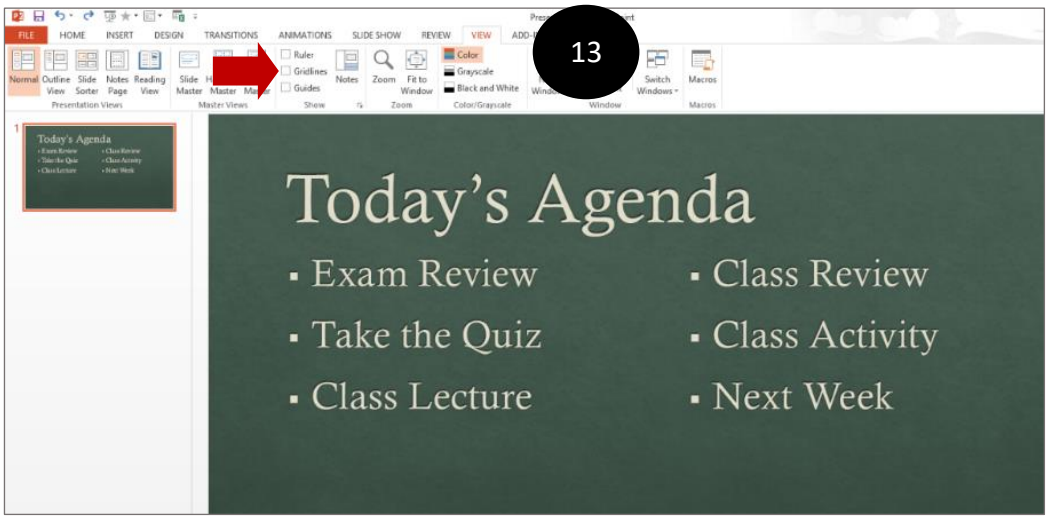
The slide should now look like this:



8. Press the Enter button, then type the words “Class Lecture”.
9. Click on the text box on the right; click next to the bullet.
10. Type the words “Class Review”, then change the font size to 40 and the Bullet Style to Filled Square Bullets.
11. Press the Enter button and type the words “Class Activity”.
12. Press Enter again and type the words “Next Week”.

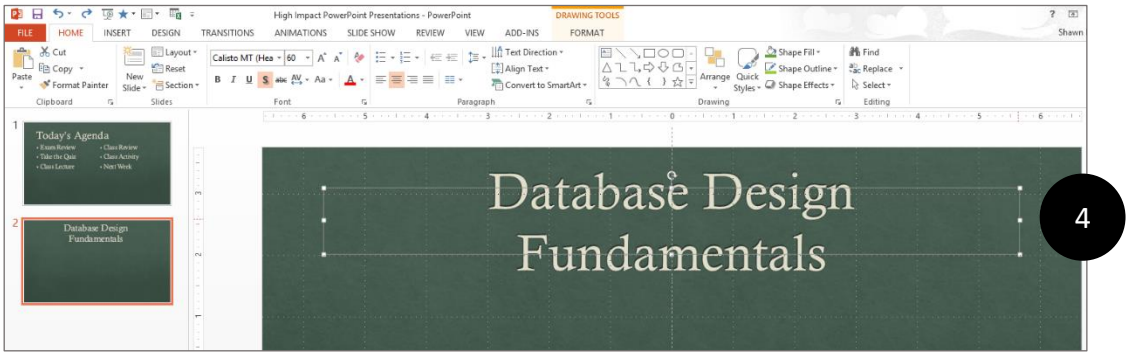
You will often want to adjust the position of your text and other objects in your slide so that they are perfectly positioned within the slide.

13. Click on the View tab, then check off the Gridlines, Guide and Ruler options, to help you do this:

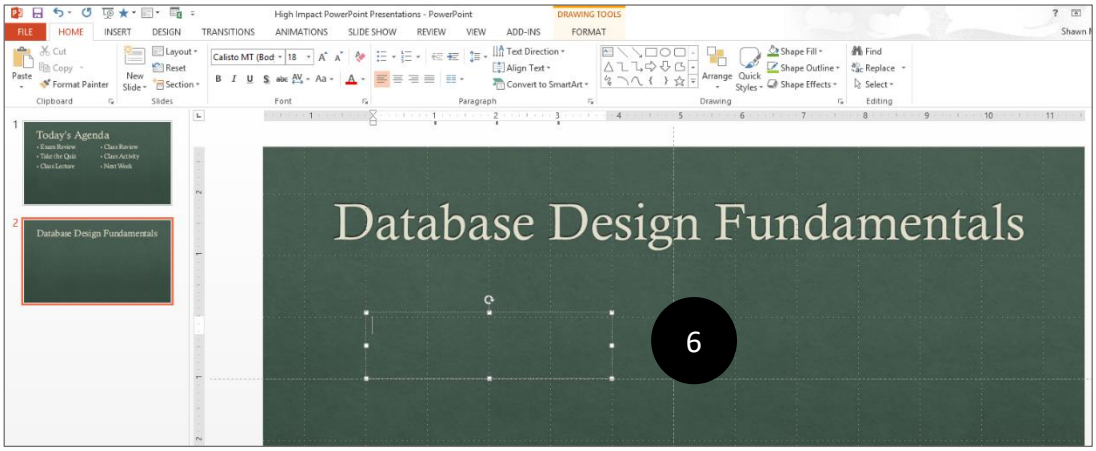


Lesson 2: Insert Text Boxes

1. Press CTRL+M to add a new slide. Change the Layout to “Title Only”.
2. Click on the Text Box, then type in the words Database Design Fundamentals.
3. Press CTRL+A. With the Home tab selected, change the font size to 60.
4. Move the cursor to the right side of the Text box, with the two arrows displayed, make the Text Box wider.



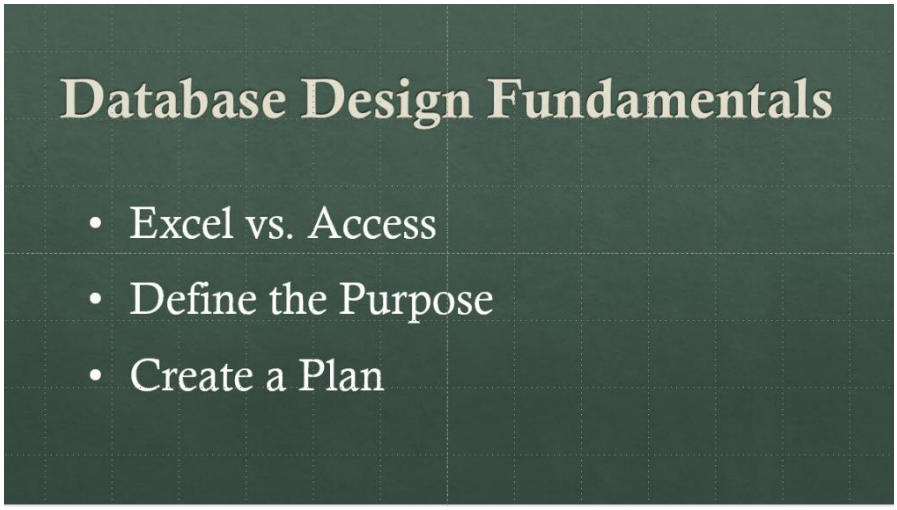
5. Click on the Insert tab, then click on the Text Box button from the Text group.
6. Hold down the left click button on the mouse and draw a text box onto the slide that is approximately 1 inch high and 4 inches wide (use the ruler as a guide).



7. Type the words “Excel vs. Access” inside the Text Box. Click on the Home tab, then press CTRL+A. Change the font size to 48.
8. Click on the Text Box. Press CTRL+C to copy it; press CTRL+V twice to paste two copies of the text box onto the slide.

9. Align the three text boxes onto the left side of the screen. Type the following words into each text box: Excel vs. Access (first textbox), Define the Purpose (second textbox), Create a Plan (third textbox).

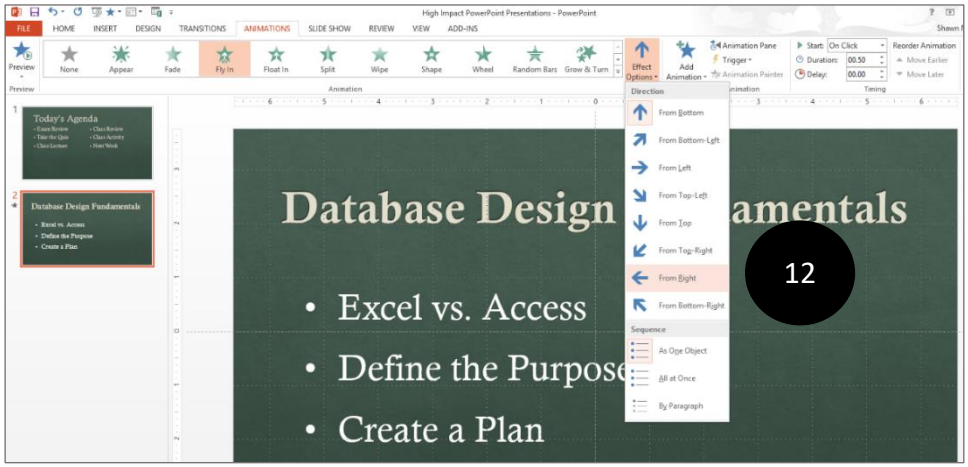
10. The slide should now look like this:



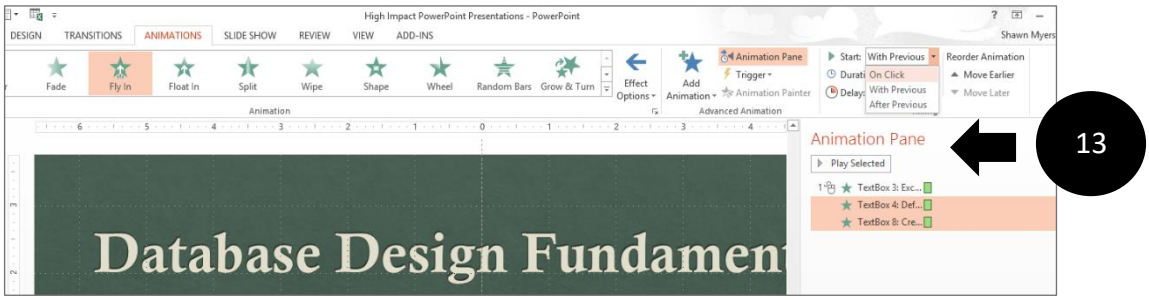
Apply a Single Animation to a Text Box

11. Click on the first text box, **hold down the Shift key,** then click on the other two text boxes.

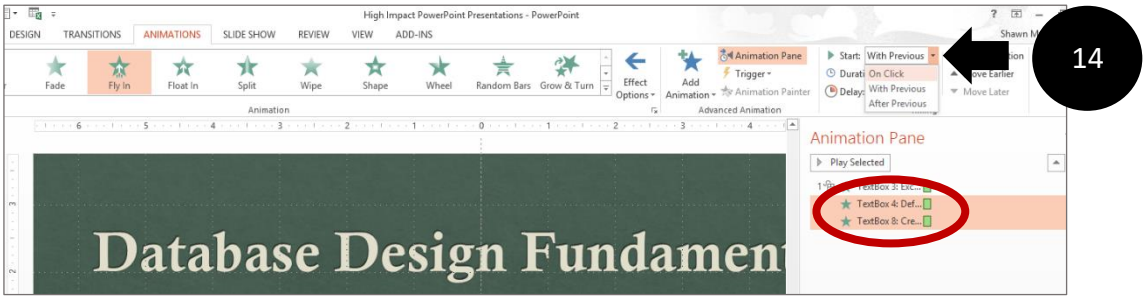
12. Click on the Animations tab, then click on the Fly In animation from the Entrance group. Click on the Effect Options button and choose From Right.



13. With the Animations tab still selected, click on the Animations Pane button. Hold down the Shift key and click on the second and third animations from the Animations Pane dialog box to select them.

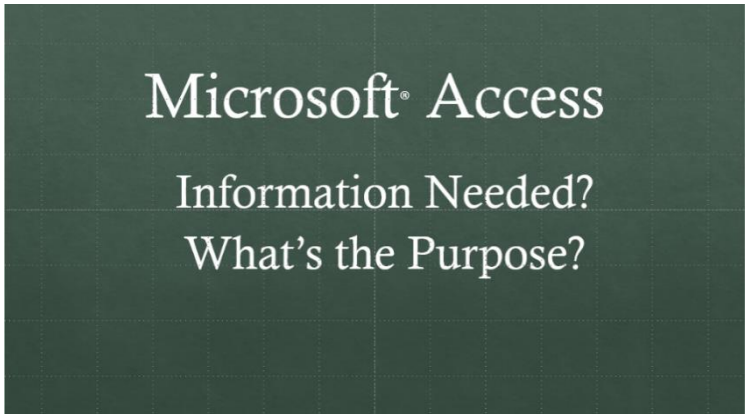


14. Change the Start option from the Timing group to With Previous; close the Animation Pane.

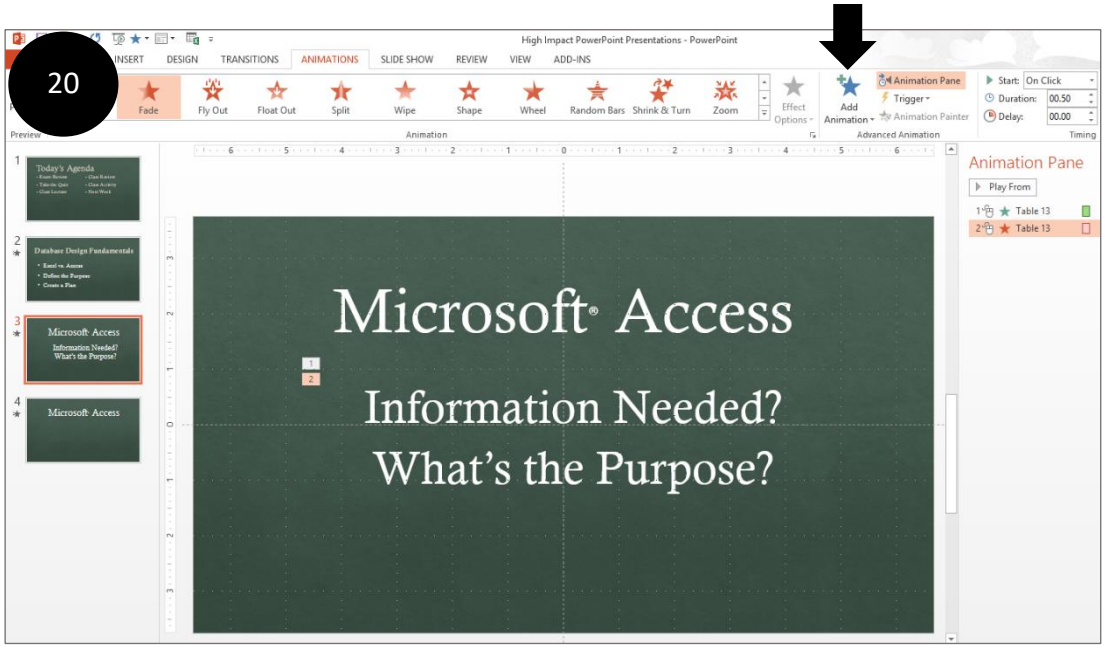


Apply Multiple Animations to a Text Box

15. Press CTRL+M to add a new slide. Choose the Title Only slide layout.
16. Type the words “Microsoft Access” into the text box with a size 80 font.
17. Insert a text box into the slide; type “Information Needed” and “What’s the Purpose into the text box.
18. Align the text box in the center of the slide and change the font size to 60.



19. Click on the Animations pane and choose Fade from the **Entrance** group.
20. Click Add Animation and choose Fade from the **Exit** group.



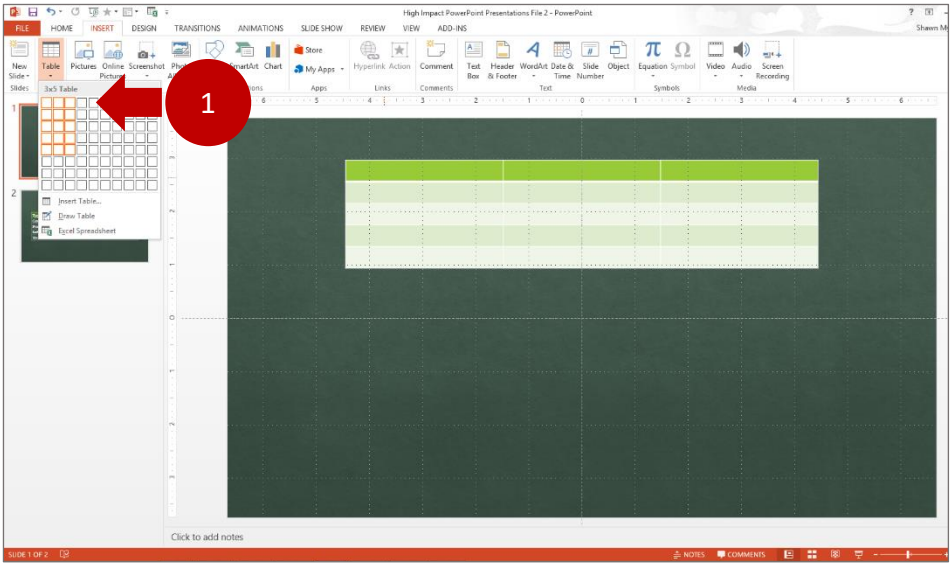
21. Click on the Home tab, then click on the drop-down arrow on the New Slide button.
22. Click on Duplicate Selected Slides.
23. Click on the text box on the duplicated slide; press CTRL+A, press the Delete button on your keyboard.
24. Type “97 Clients”, “14 Employees” and “32 Vendors” inside the text box.

25. Click on the text box and press CTRL+X to cut the text box from the slide. Click on slide #3 and press CTRL+V paste the text box onto the slide. Align the text box so it is directly over the first one:

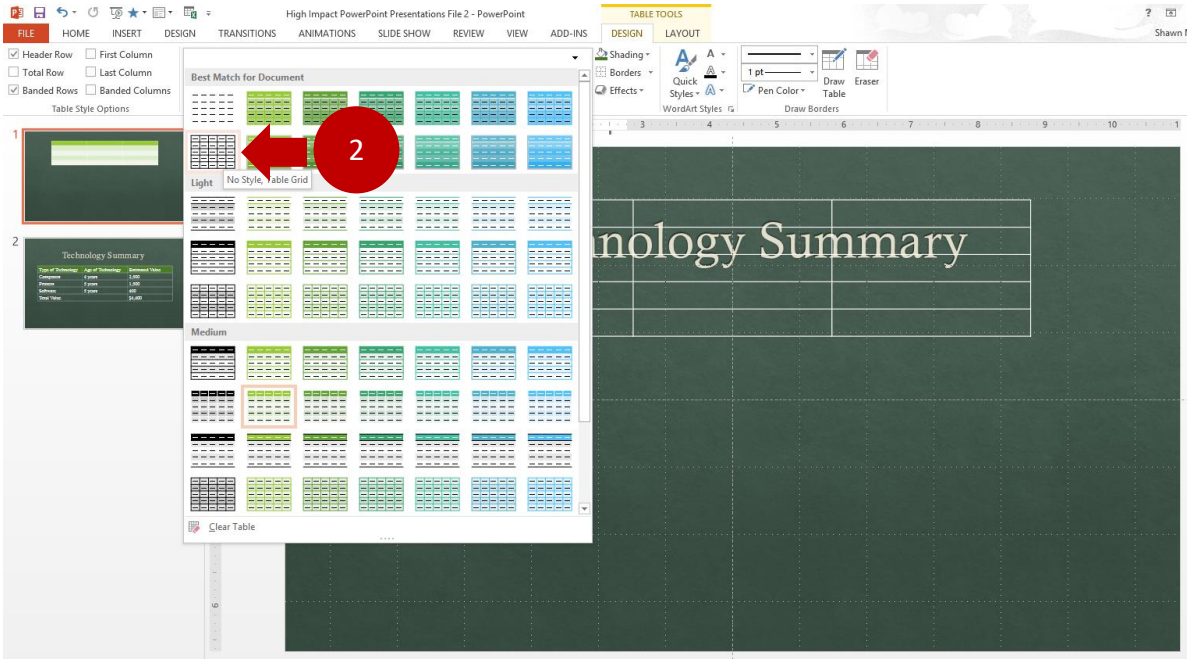
26. Click on Slide #4 and delete it. Go to the Animation Pane and preview the slide. The Entrance and Exit Animations should all have the "On Click" Timing option selected.

Lesson 3: Insert and Design Tables

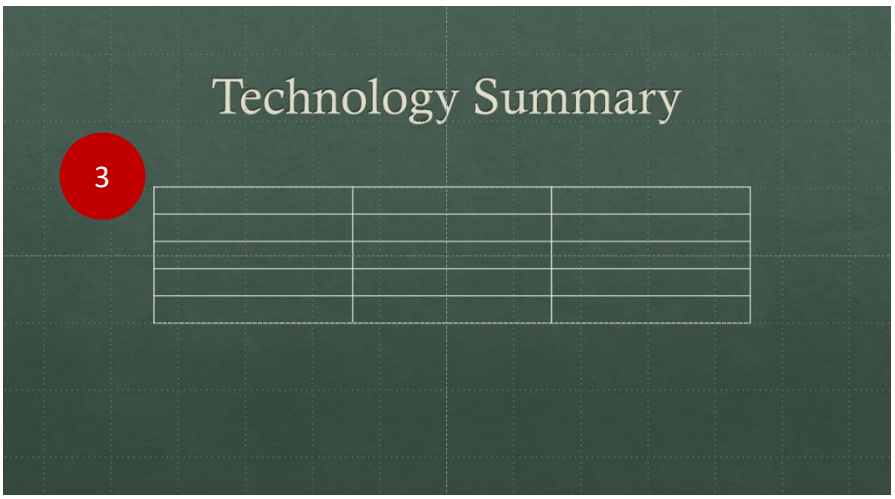
1. Click on the Insert tab, then click on the Table button down arrow from the Tables group; choose a 3 x 5 table.



2. Click Design under the Tab Tools tab, under Best Match for Document, choose No Style, Table Grid.



3. Position the Table so that it is just underneath the slide title.

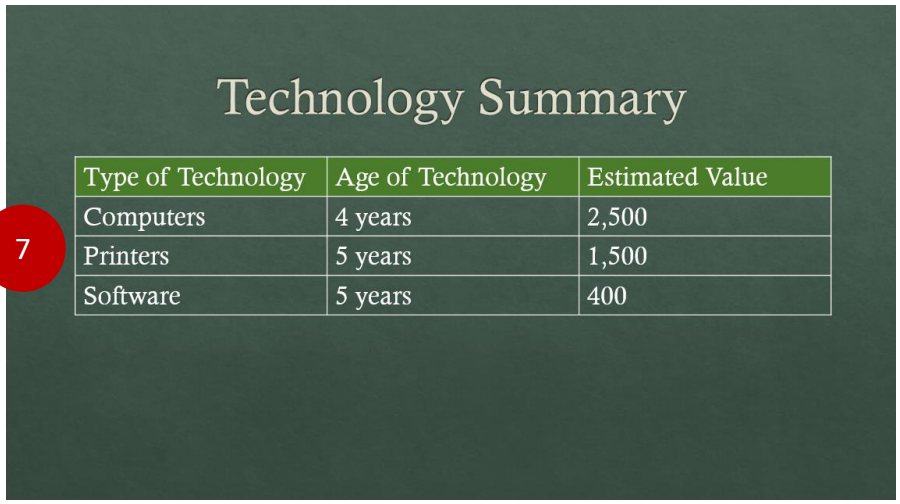


4. In the first cell in the **first row,** type the word “Type of Technology”, then press the Tab key, type the words “Age of Technology” press the Tab key, then type “Estimated Value”.

5. Select the first row in the Table and press CTRL+B to bold the text.

6. Click on the Design tab, then click on the Shading button and select Lime, Accent 1, Darker 25%.

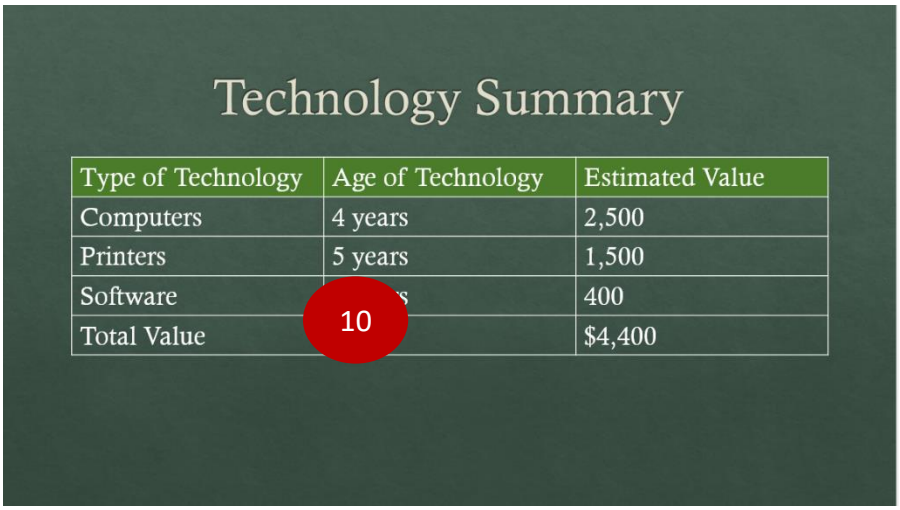
7. Type the follow information into the second, third and fourth rows.



8. Click on the Table, then from the Layout tab, choose Insert Below from the Rows and Columns group.

9. Select the last two columns in the last row. With the Layout tab selected, choose Merge Cells.

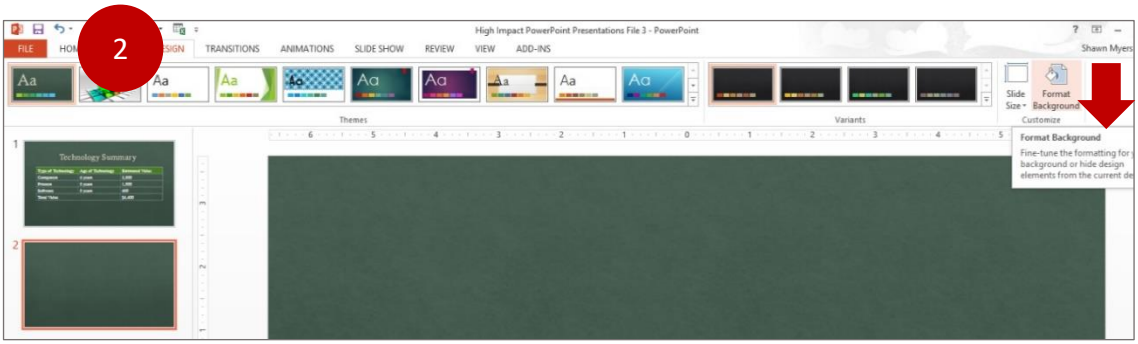
10. Type the words “Total Value” into the last column of the first row; Type $4,400 into the last cell in the last row.



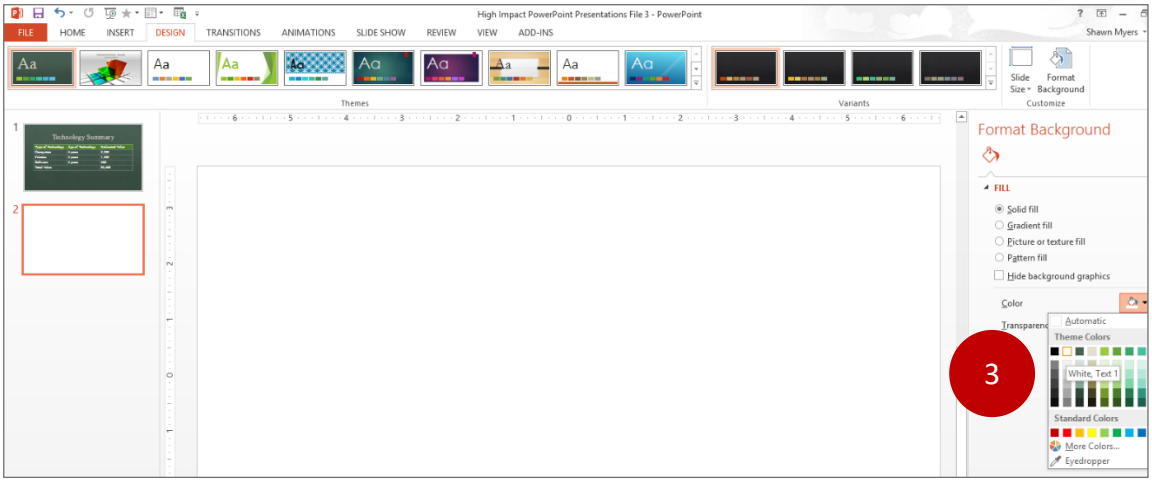
Lesson 4: SmartArt Graphics and Shapes

1. Click just below the last slide; press CTRL+M to add a new slide, then click on the text box to delete it.

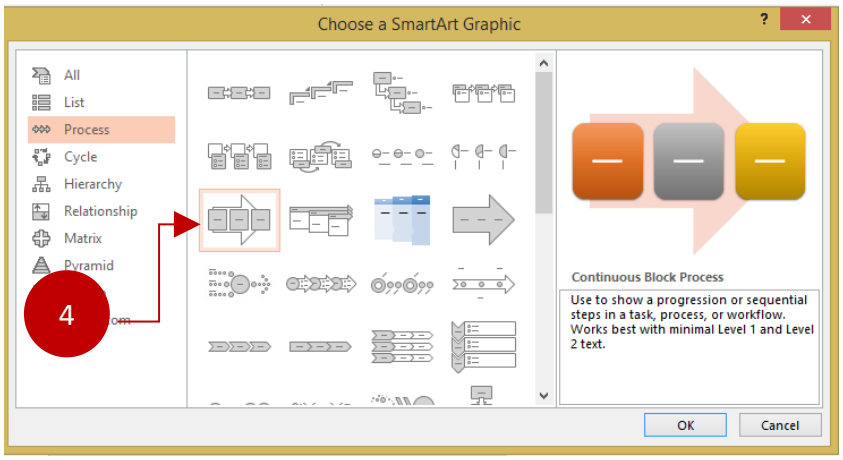
2. Click on the Design tab, click on the Format Background button from the Customize group.



3. Under Fill choose Solid, then choose White, Text 1 as the background color:

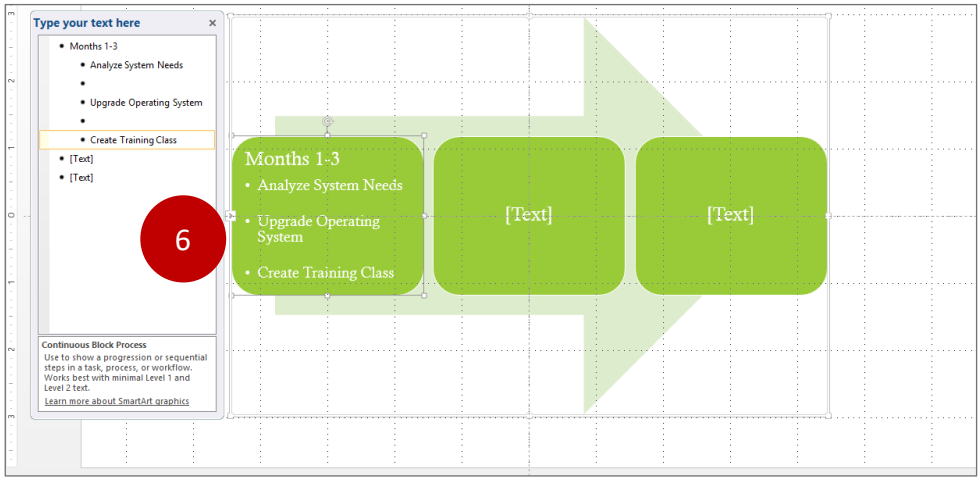


4. Click on the Insert tab, SmartArt. Choose Process Group and select the Control Block Process option.



5. In the first bullet point, type “Months 1-3”; press the Down arrow on your keyboard, then press the Tab button to insert a bullet point. Press Enter.

6. Type the following list, pressing the Enter button twice after each entry: Analyze System Needs, Upgrade Operating Systems, Create Training Class.

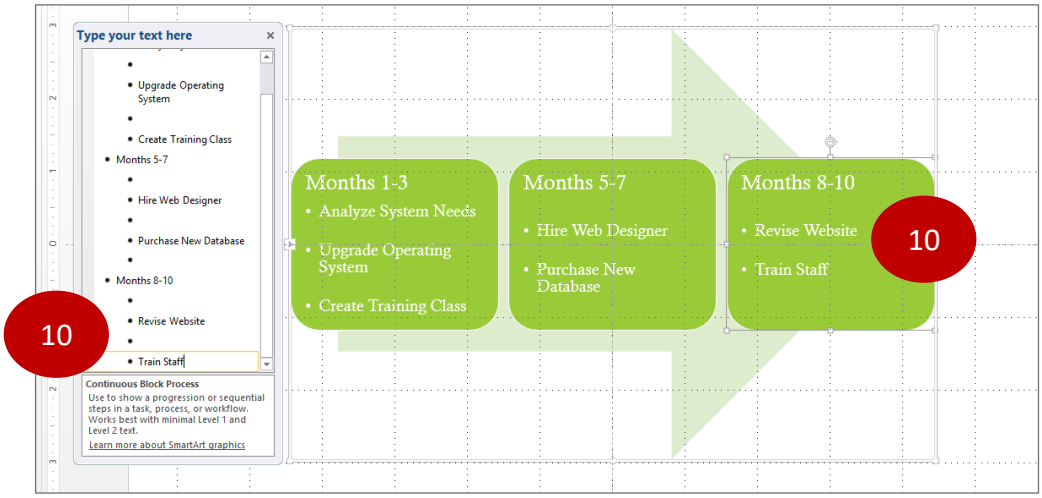


7. Press the Down arrow to select the next shape. Type “Months 4-5”; press Enter, the Tab key, press Enter again.

8. Type “Hire Web Designer”, press the Enter key twice, then type “Purchase New Database”.

9. Press the Down arrow button to select the next shape. Type “Months 6-7”. Press Enter, the Tab key and press Enter again.

10. Type “Revise Web Site”, press the Enter key twice, then type “Train Staff”.

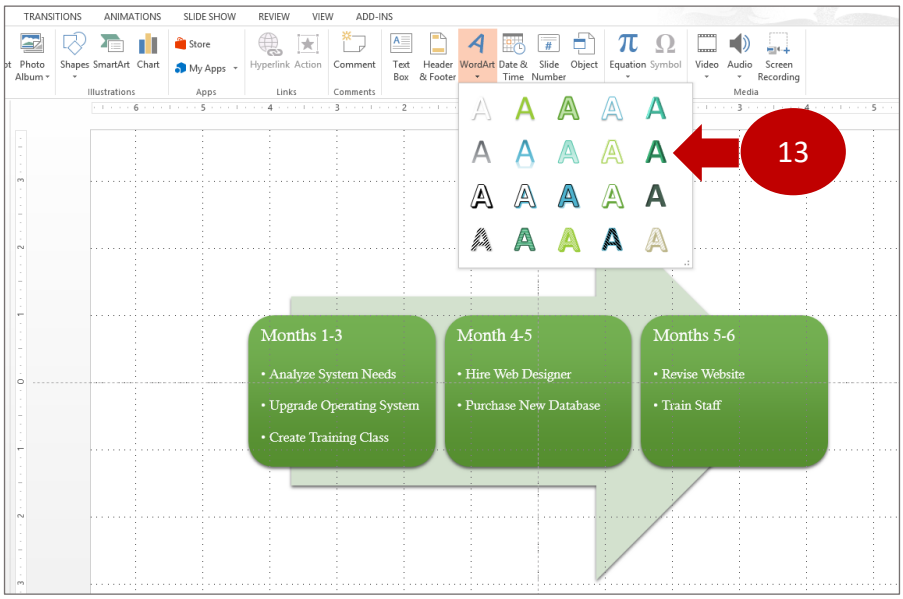


11. With the SmartArt graphic selected, click on the Design tab. Under Change Colors, change the color to Accent 2, Color Filled; Under SmartArt Styles, choose Moderate Effect.

Apply Animations to SmartArt graphics

12. From the View tab check off Show Ruler and Gridlines.

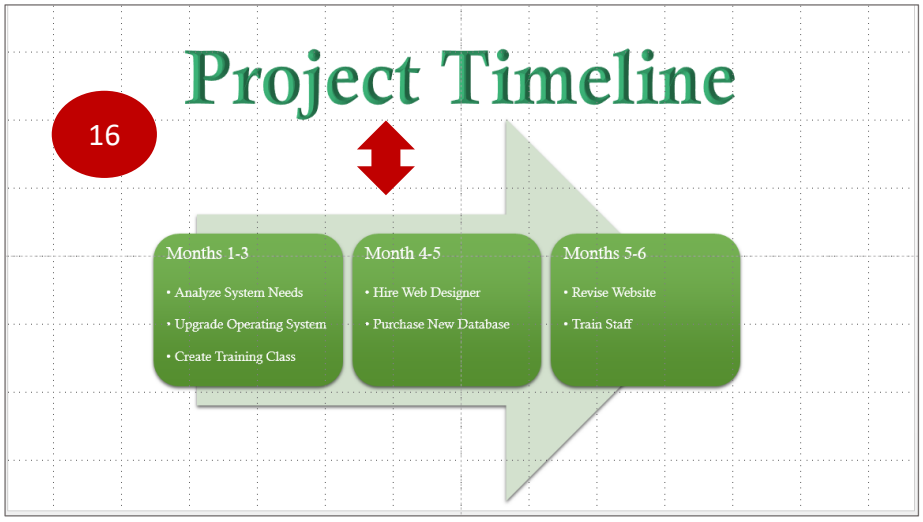
13. From the Insert tab click on WordArt. Choose Green Accent, Sharp Bevel.



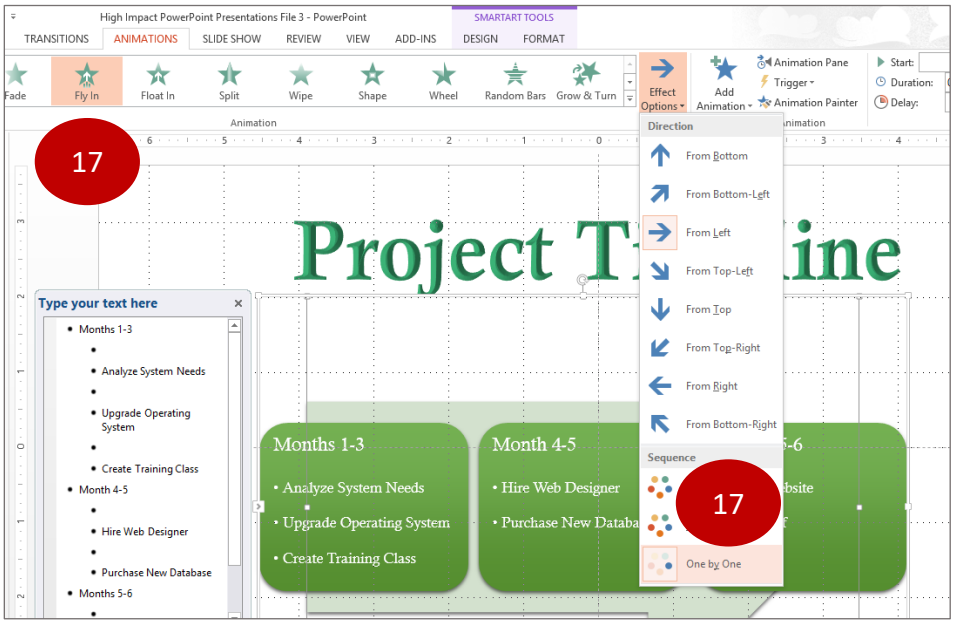
14. Move WordArt graphic to the top of the slide so it is easier to see. Click inside the box and press CTRL+A to select the text.

15. Type the words “Project Timeline”. Click on the Home tab and change the font size to 80.

16. Position the WordArt and SmartArt graphics in the center of the slide. Make sure there is enough spacing between the graphics.

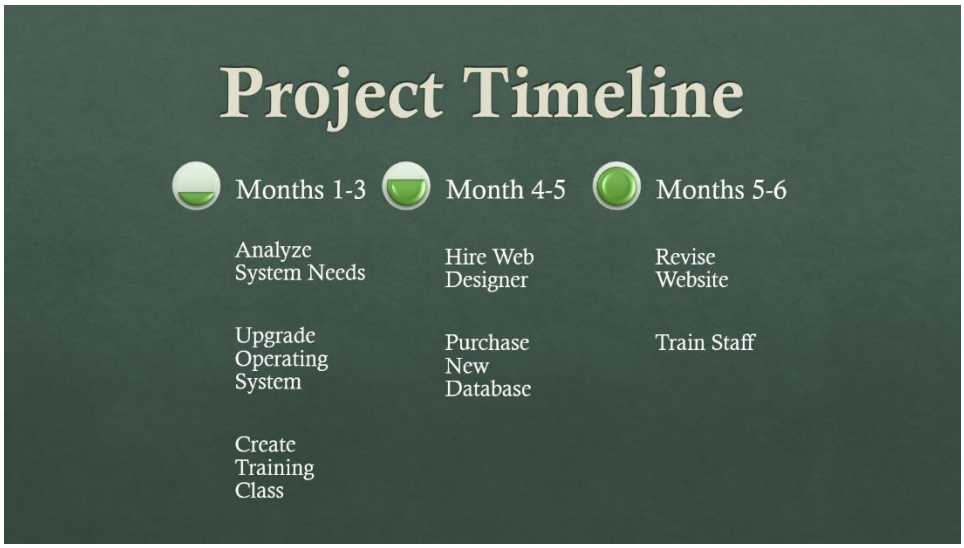


17. Click on the SmartArt graphic, then click on the Animation tab and choose Fly-In, From Left, One by One.



18. With the Animation tab selected, click on the Animation Pane. Click on the down arrow to expand. Click on the first animation and choose None from the Animation group.

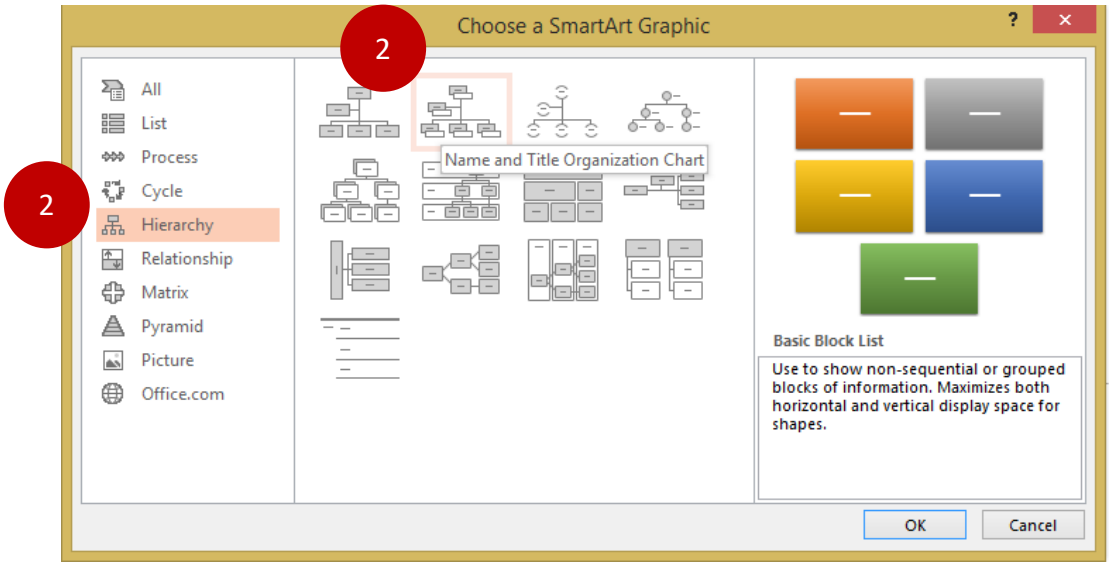
Once you've created a SmartArt graphic, you can experiment with other designs by simply moving the cursor over the design options. Recall that you can also add Animations so that only one month on the timeline is show at a time. Here's another example of what a Timeline graphic might look like:



Create an Organization Chart

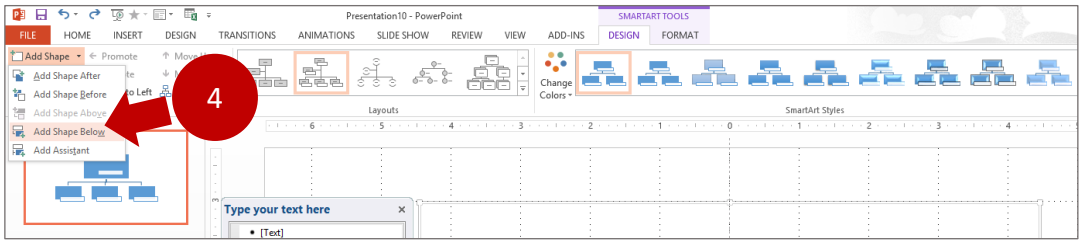
1. Open a new Slide presentation with no layout (Blank).

2. Click Insert, SmartArt. Choose the Hierarchy option and choose the Name and Title Organization Chart.

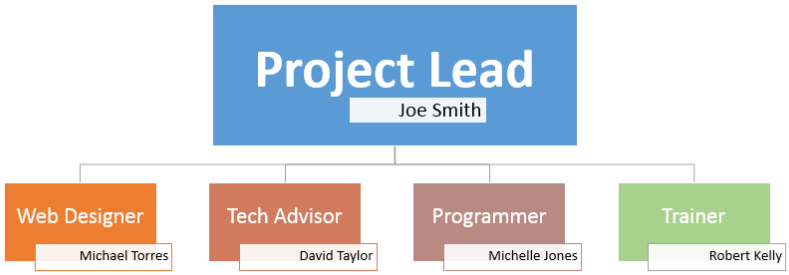


3. Delete the shape in the center of the graphic; enlarge the shape at the top of graphic.

4. With the shape on top of the graphic still selected, click on the Add Shape down arrow in the Create Graphic group. Choose Add Shape Below.



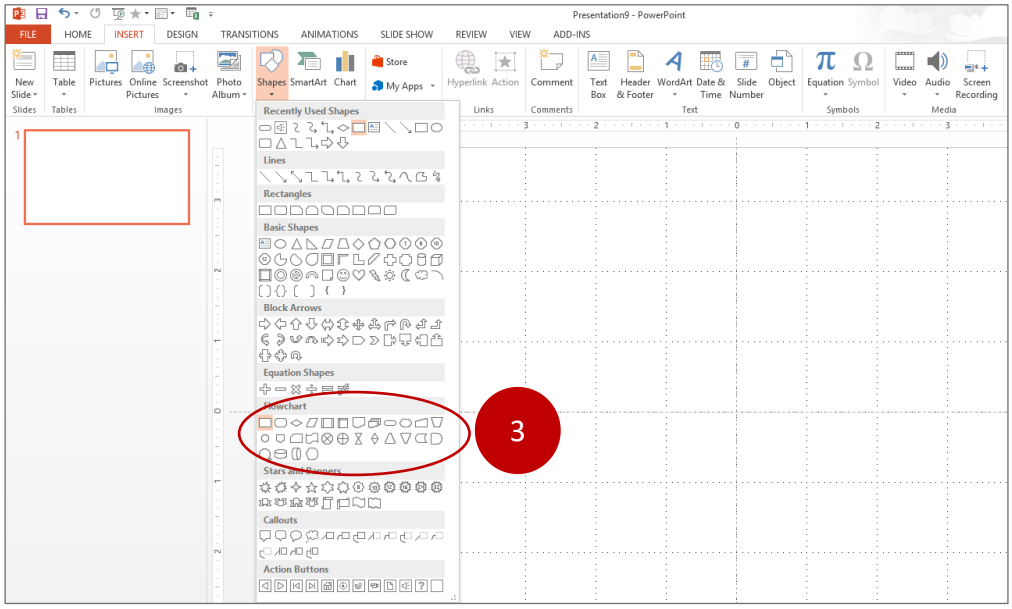
5. From the Design tab, choose a Change Colors and a SmartArt style. Add names and tiles to the graphic:



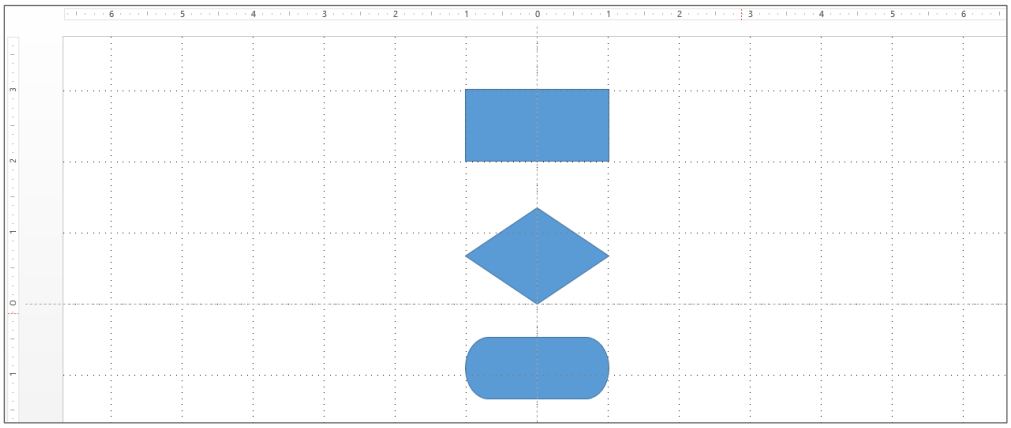
Create a Flowchart using Shapes

Flowcharts are useful when you need to create a document that describes a process for doing things, such as interviewing job candidates, how to handle payments to vendors and sales order fulfillment. In this example, we will create a flowchart that describes a process for making payments to vendors.

1. Open PowerPoint and insert a new Blank slide.
2. Click on the View tab; check off the Ruler, Gridline and Guides options from the Show group.
3. Click on the Insert tab, click on the Shapes button from the Illustrations group. Select the Process, Decision and Terminator shapes.



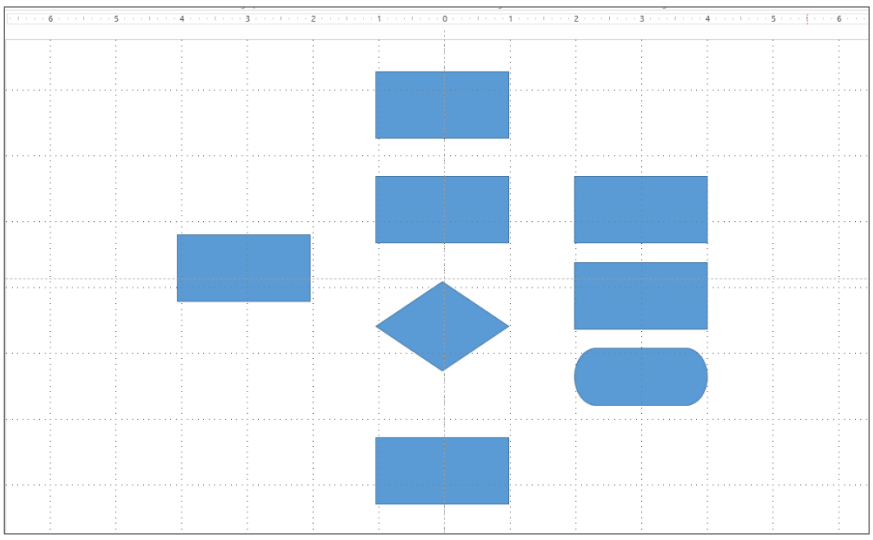
4. Click on each shape and align it in the center of the slide. Use the alignment guides to adjust the size of each shape so that they all have the same width.



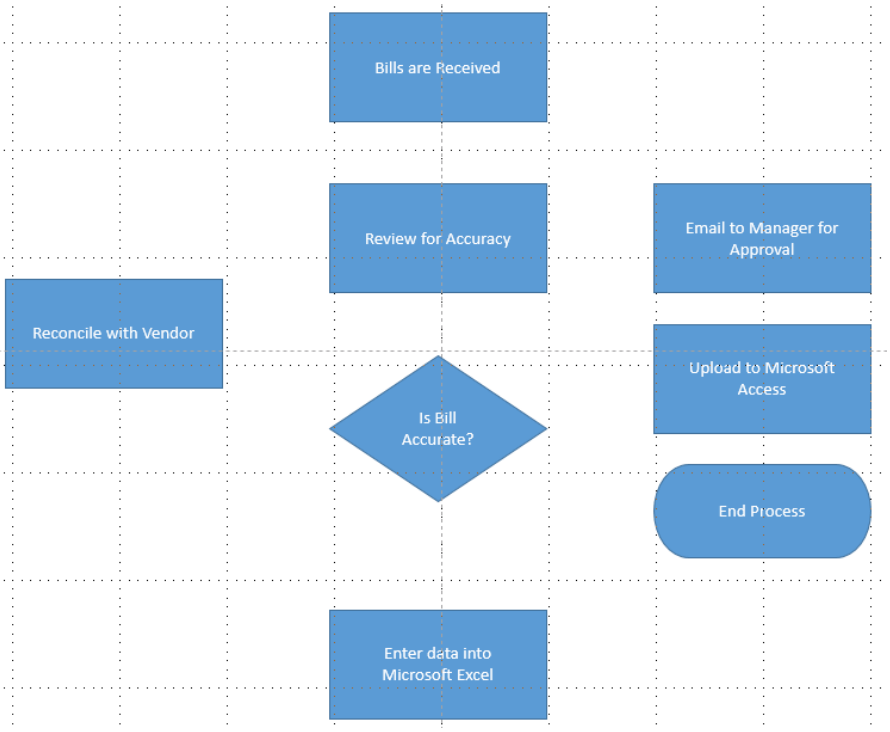
Click on the Process shape; press CTRL+C, then press CTRL+V *five times* to make copies of the shape.

5. Move one Process shape to the left of the slide, then move the Terminator shape and two of the Process shapes to the right side of the slide. Position the remaining shapes in the center of the slide.

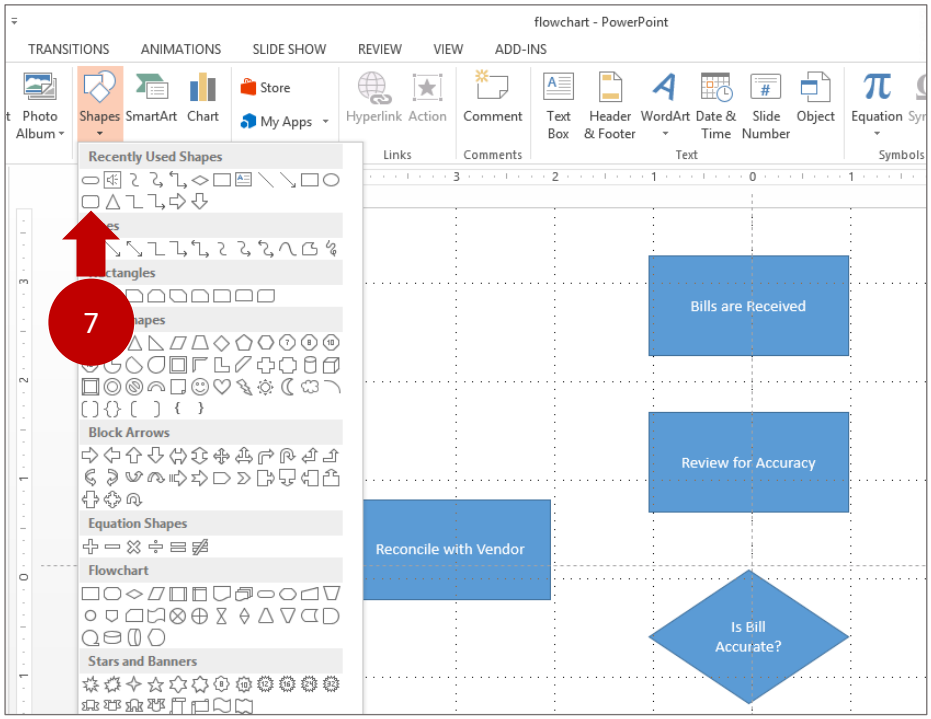
The layout for the flowchart should now look like this:



6. Click on the Home tab and choose 12 as the Font size. Click on each shape and enter the text as shown:

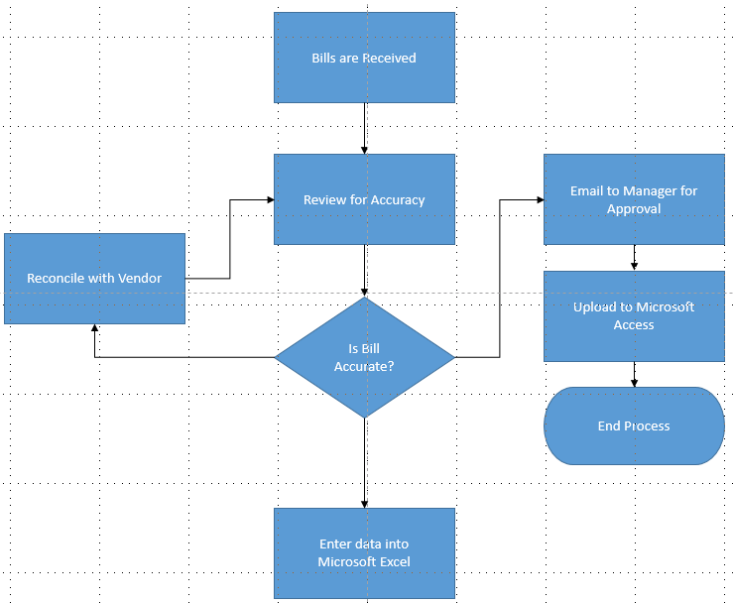


7. Click on the Process shape at the top of the slide; click on Shapes button from the Illustrations group. Choose Arrow from the Lines group



8. Position the cursor over the small black circle at the bottom of the Process shape to the small black circle at the top of the Process shape just below it.

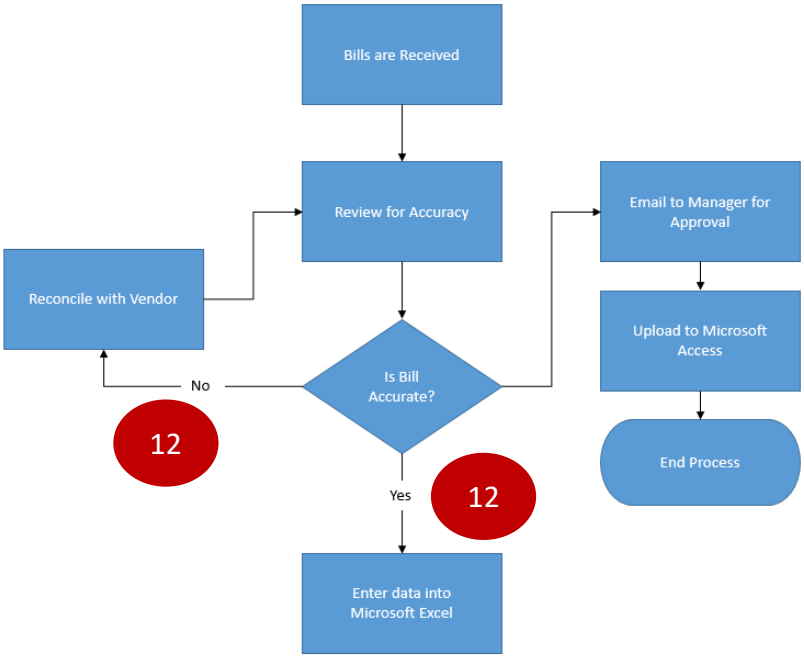
9. Use a combination of Arrow and Elbow Arrow Connector shapes to connect the shapes together



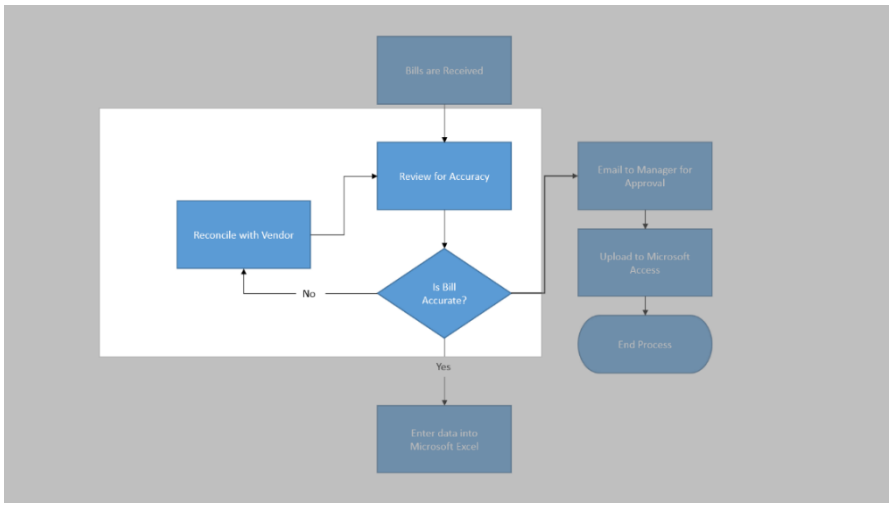
10. Click on the Insert tab and choose Text Box; draw a text box onto the slide. Press CTRL+C and CTRL+V to create a copy

11. Type “Yes” into the first text box and “No” in the second text box

12. Right-click on each text box and change the fill color to White. Position each text box onto the flowchart

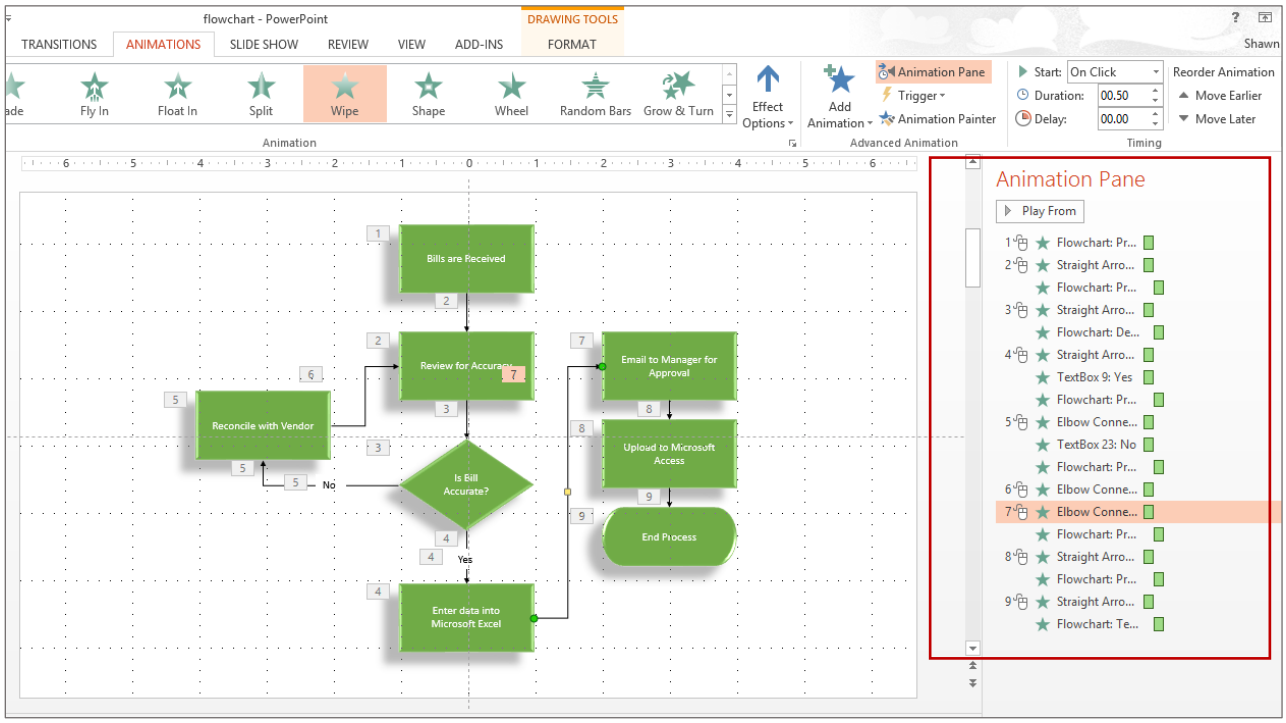


13. When presenting a flowchart within a PowerPoint presentation you may want to use the Zoom-In tool to highlight certain aspects of the flow chart. To activate it, run the slide show, right-click and choose Zoom-In. Left-click on the mouse to magnify the Zoom-In area; right click the mouse to turn it off

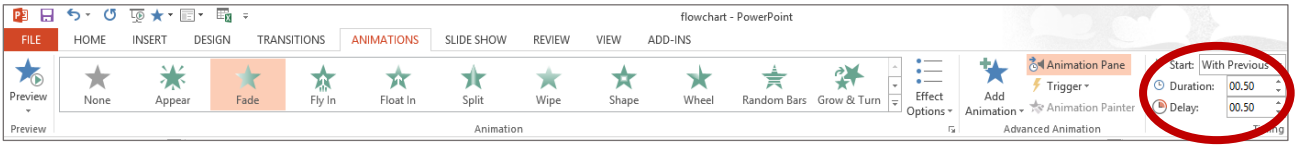


Apply Animations to a Flowchart

If you are using the flowchart to explain a process step-by-step, you apply individual animations to each shape. A good choice for animating shapes within a Flowchart would be the Fade animation. Each arrow in the flowchart can be animated with the Wipe option and then choosing the Right, Left, Up or Down Effect option for each arrow:

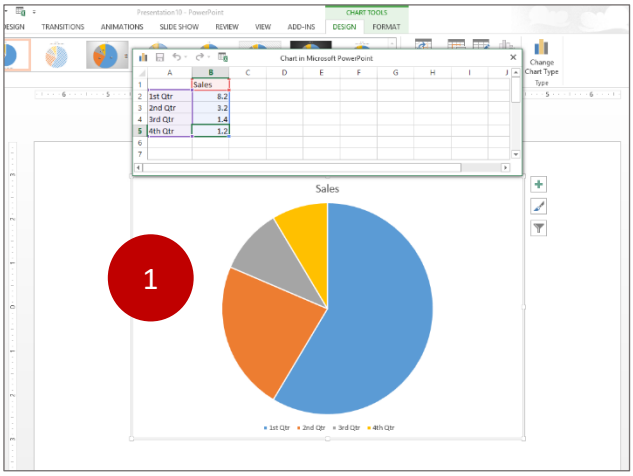


To make the Animations to run smoothly, you will need to adjust the Timing options. Each arrow on the flowchart should have a Start setting of “On Click”; each Shape that is *preceded* by an arrow should have a “With Previous” setting along with a Delay setting of .50. This assures that Arrow set to Wipe will appear on the side just before the Shape appears:



Lesson 5: Create Charts and Apply Animations

1. Open a new PowerPoint file, then chose Blank under Layout. Click Insert, Chart, Pie chart. A chart template will open:



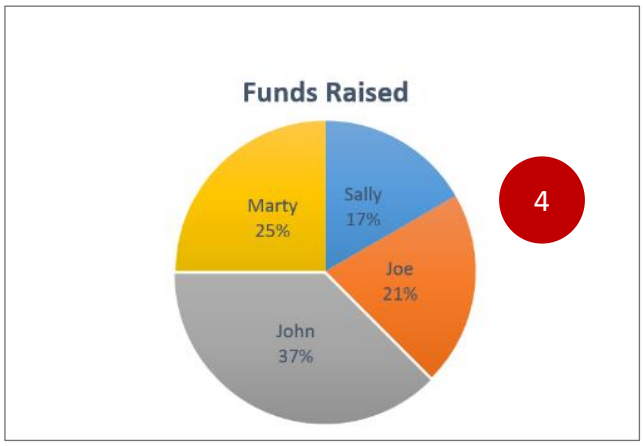
2. Change the chart title to “Funds Raised”.
3. Click on the worksheet and enter the following text:

3

Employee	Funds Raised
Sally	20,000
Joe	25,000
John	45,000
Marty	30,000

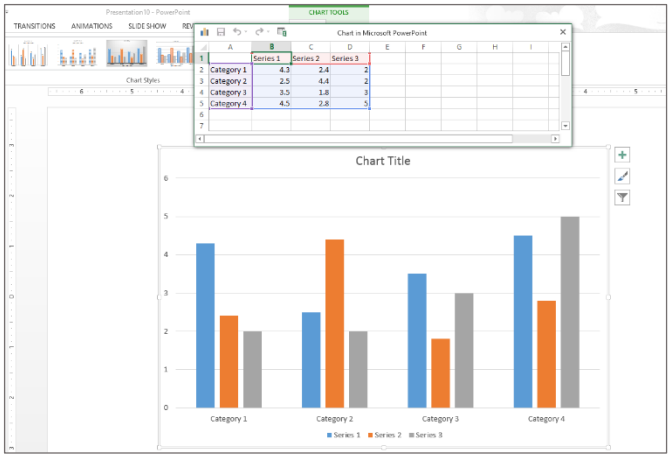
4. Click on the worksheet to close it. Make the following changes to the chart:

   a. Chart Style: Style 5
   b. Quick Layout: Layout 1
   c. Title Font Size: 36
   d. Percentage Font Size: 24



Create a Chart with Animations

5. Click Insert and choose the Clustered Column chart.



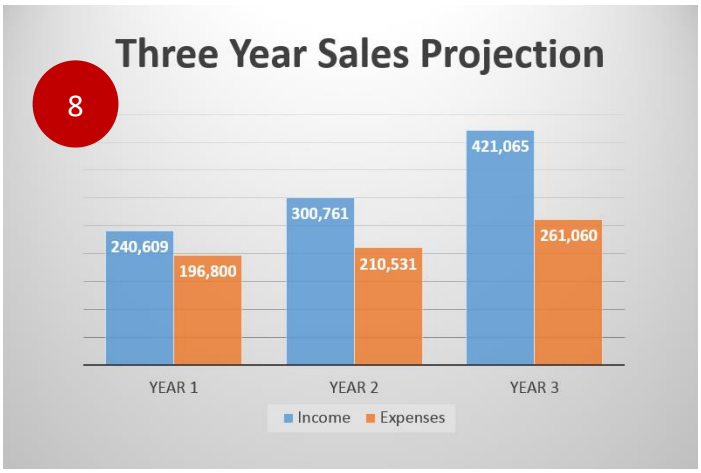
6. Delete row 5 and column D on the worksheet, then enter the following information

	Income	Expenses
Year 1	240,609	196,800
Year 2	300,761	210,531
Year 3	421,065	261,060

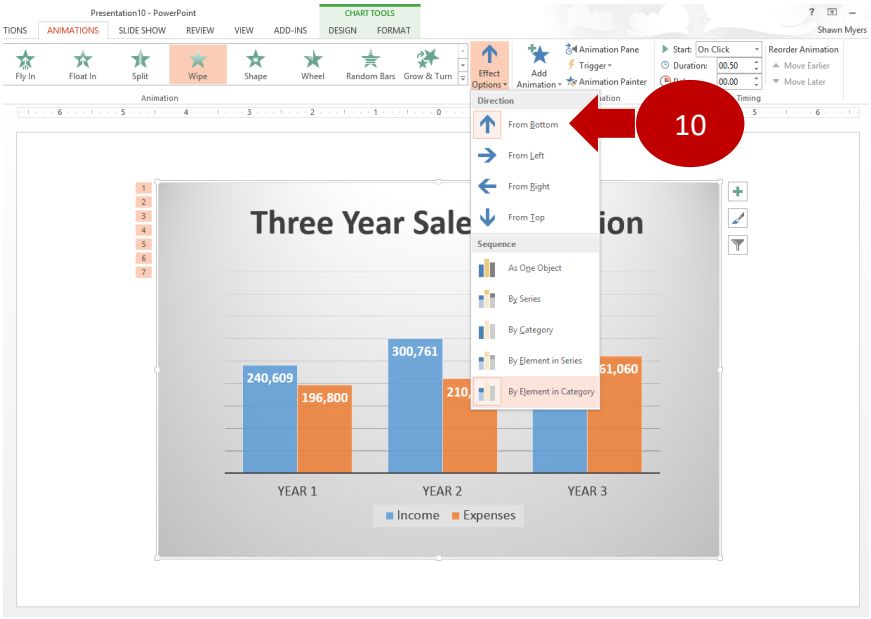
7. Close the worksheet; click on the chart and choose the following options:

   a. Quick Layout: choose #9
   b. Chart Styles: choose #4
   c. Change Colors: choose Color #1

8. Delete all Axis titles. Click on the Chart Area and make it a little smaller. Click on the text and make the Fonts a size 16. Change the chart title to “Three Year Sales Projection” and change the Font size to 40.

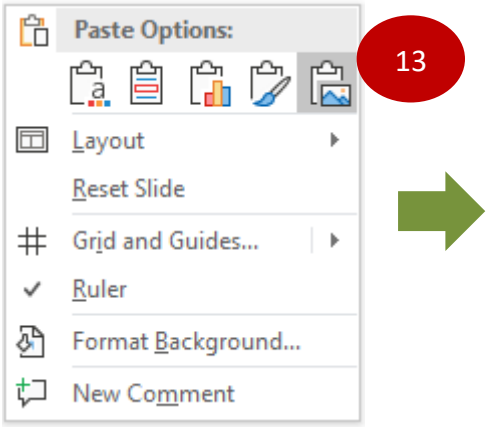


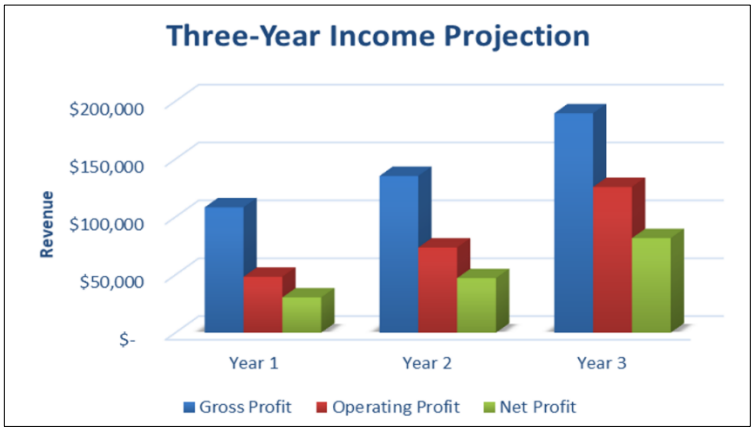
9. Click on the Animations tab; Choose Wipe.
10. Under Effect Options, choose From Bottom from the Directions group; choose By Element in Category from the Sequence group.



Copy and Paste a Chart from Excel

11. Open the Excel File. Click on the Chart and press CTRL+C.
12. Go to the PowerPoint slide and right-click on the Slide and you'll see Paste Options. You can now paste the chart into the slide with the original format, paste the chart into the slide so that it uses the Theme colors of the slide or paste the chart as a Picture. The last option (Picture) allows you paste the chart onto the slide without having to adjust the font size or chart area size.
13. Choose the Picture option. Resize the image so that it is in the center of the slide.





Lesson 6: Pictures and Screenshots

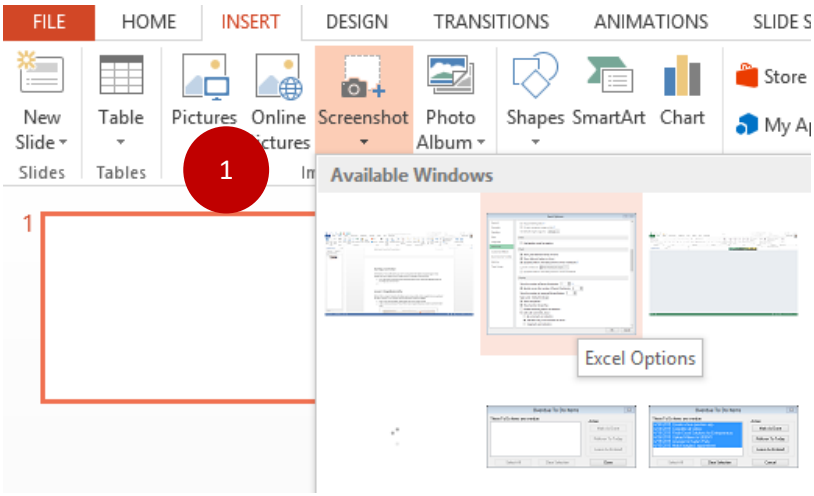
1. Open a blank PowerPoint slide.
2. Click on Insert, Pictures from the Illustrations group; we'll use a picture file called "Skyscrapers".
3. After the picture has been inserted, use the small boxes at the edges of each slide to position the picture over the entire slide.

4. To add text, click on the Insert tab and choose Text Box.
5. Draw the Text box onto the picture. Type "The City at Sunset" and change the font size to 72.

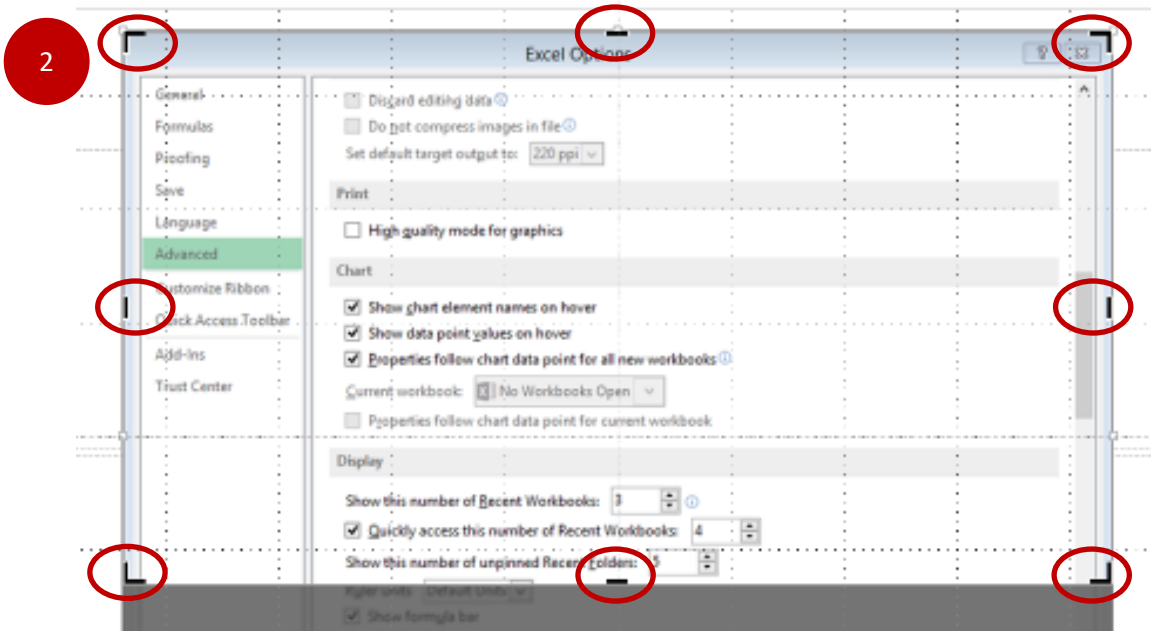
You can also layer multiple photos onto one slide and apply an Animation to each slide, which allows you to "tell a story" using pictures.

Inserting a Screenshot

1. Go to the Insert tab and click on the Screenshot down arrow. Choose the application that has the image you want to insert.



2. Right click on the screenshot and click on the Crop button. Use the markers on each side of the screenshot to select the parts of the image you want to insert. The area of the image that will be cut will be shaded in gray:

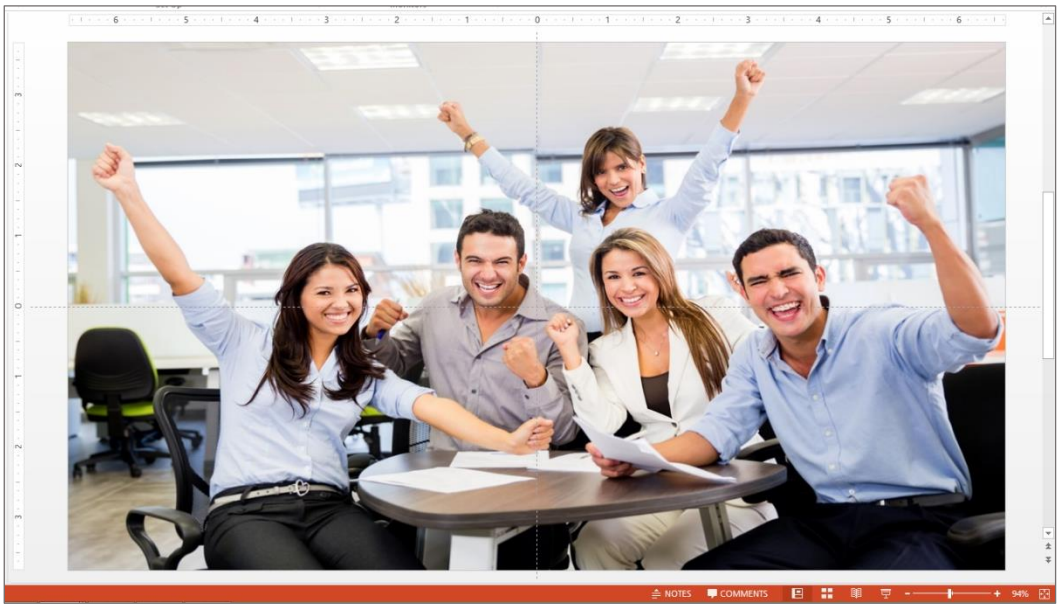


3. Click away from the image to paste it into the slide. Screenshots are automatically converted to picture file, so you can also add one or more Animations.

Lesson 7: Motion Path Animations

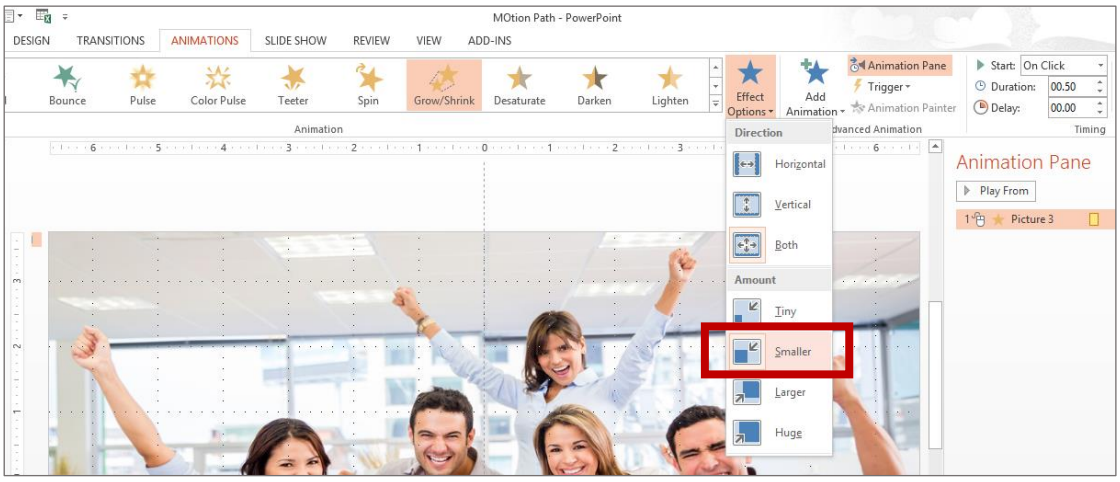
A Motion Path is a type of Animation that allows you to move a table, chart or graphic from one section of the slide to another.

1. Open a new slide and apply a Slate design with a Green Yellow Variant.
2. Click on Insert and choose a Picture file to insert. Expand the picture so that it covers the entire slide.

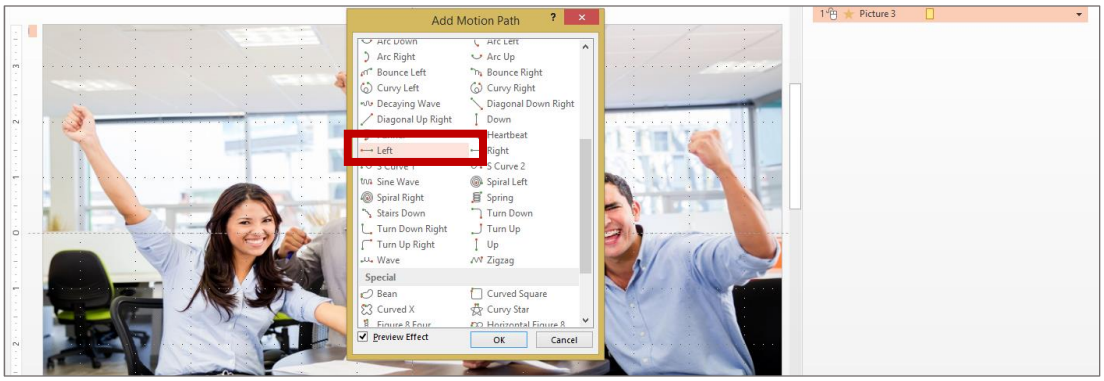


Let's now combine a Motion Path with the Grow/Shrink Animation.

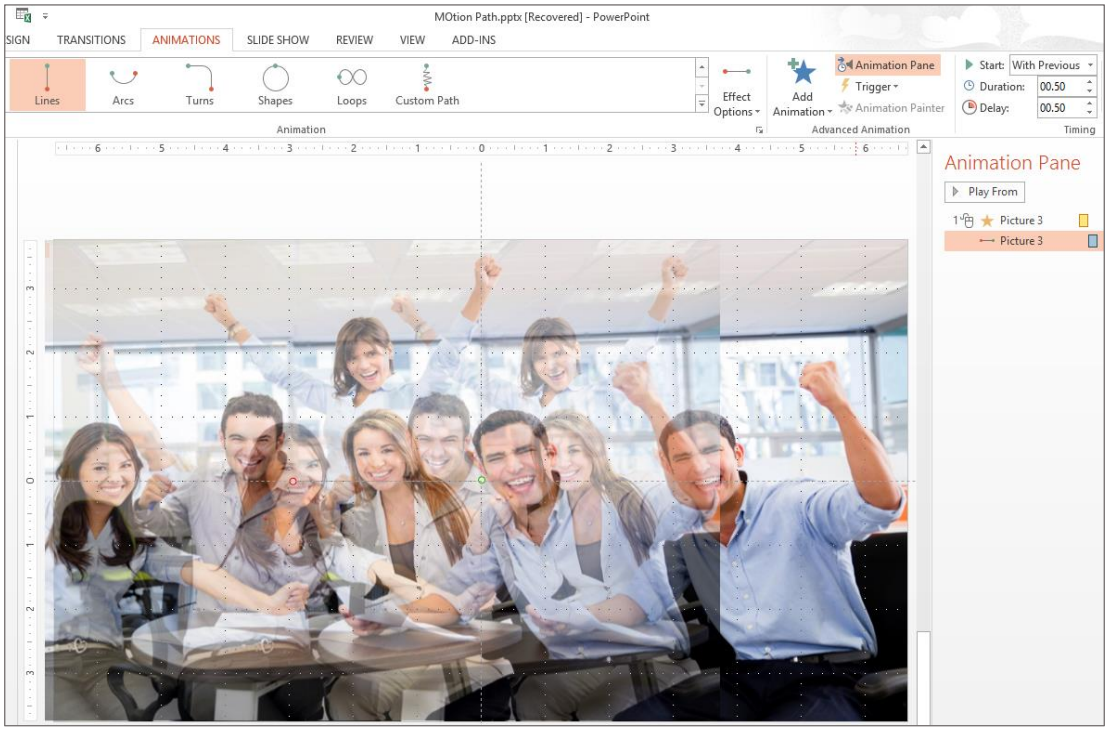
3. Click on the Picture. From the Animations tab, choose Grow/Shrink. Under Effect Options, choose Smaller. This setting will reduce the image, by default, to 50% of the original image.



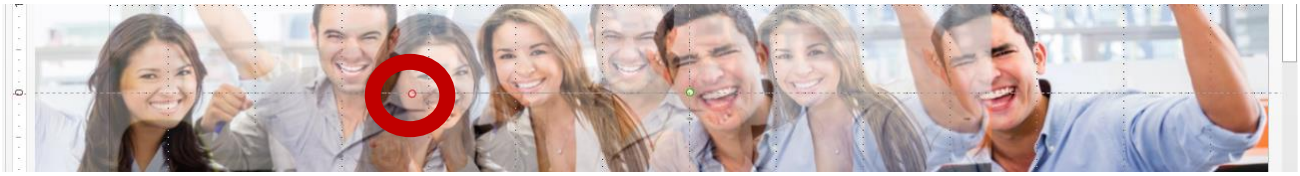
4. To make the image shrink and move at the same time, click on Add Animation, More Motion Paths, Left.



To make the Growth/Shrink and Motion Path animations work at the same time, the Timing option for the Motion Path must be set to With Previous and the Duration settings for both animations should be exactly the same; which in this example would be .50. We will also set the Delay to .50 so that the picture will shrink first, and then move to the left:



Every motion path has a default setting in terms of the actual distance the object (in this case a picture) will “travel” down a path. For this example, we want picture to shrink 50% and move to the left without completely moving off the slide. We can experiment with different settings in order to prevent this by clicking on the left arrow on the Motion Path so that it becomes a small red circle. We would now **hold down the Shift key,** then use the mouse to increase or decrease the distance that the object moves down the path:



Use the Preview button from the File tab to make the necessary adjustments.

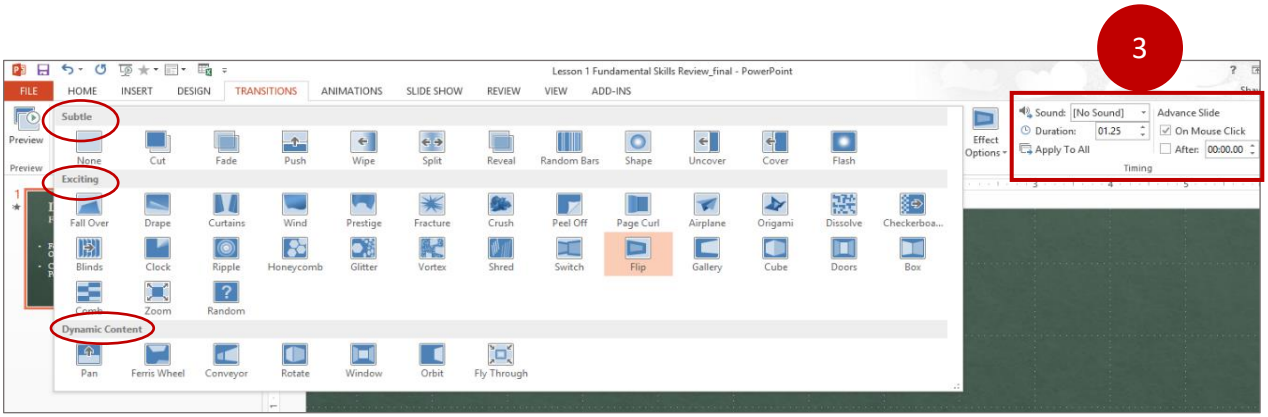
The purpose for doing a Motion Path for this slide is to show a picture, describe it verbally, then show details that describe the meaning of the picture. In this example, the picture was enlarged to cover the entire slide. Let’s now insert a Table that can be seen *after* the picture shrinks and moves to the left side of the slide. To do this, we will create the Table on a different slide, then copy and paste it onto the slide with the picture. The Table with have the last position on the Animation Pane, with the Timing set to On Click:

Lesson 8: Presenting Your Slides

Apply Slide Transitions

1. Click on the Transitions tab; choose a type of Transition: Subtle, Exciting or Dynamic Content.
2. Choose an Effect Option: This controls the direction of the slide transition, such as right, left, up, down, vertical or horizontal.

3. Choose from the following options under Timing; Sound/No Sound, Duration, and whether to advance the slide automatically or to only advance it by using a mouse click.

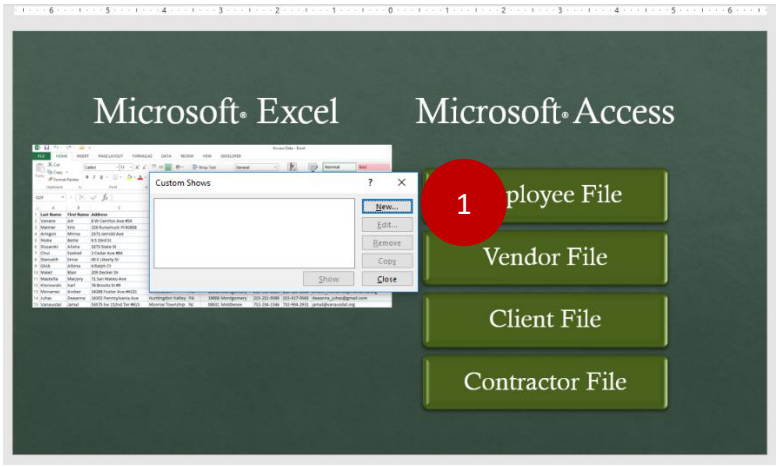


It is usually best to use a mix of different types of Transitions throughout your presentation. For example, you can use Dynamic Content Transitions for the first few slides of the presentation, followed by a mix of Subtle and Exciting Transitions for the rest of the presentation.

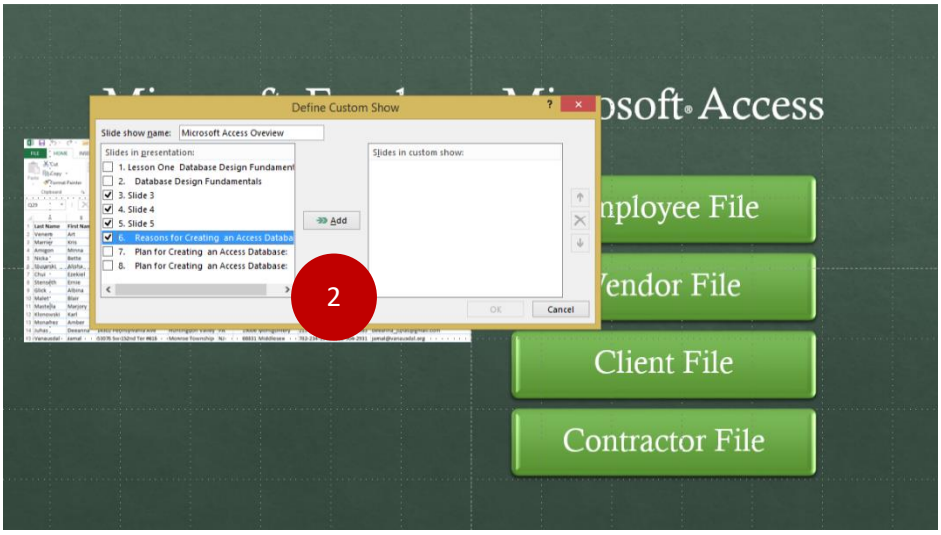
Customize a Slide Presentation

There may be times where you have a presentation that you need to present to different groups, and you don't want to show all the slides for every presentation. You can create and save one or more Custom presentations, so that you have a separate one for each audience.

1. From the Slide Show tab, click on Custom Slide Show; choose Custom Shows, New…



2. Choose a name for the slide show, which will be “Microsoft Access Overview” Check off the Slides to be included in the Custom Show. Click the Add button, click OK, then Close.



3. To run the custom show you just created, you would go to Custom Show and choose the show listed (Microsoft Access Overview).

Record Slide Shows with Voice Narration

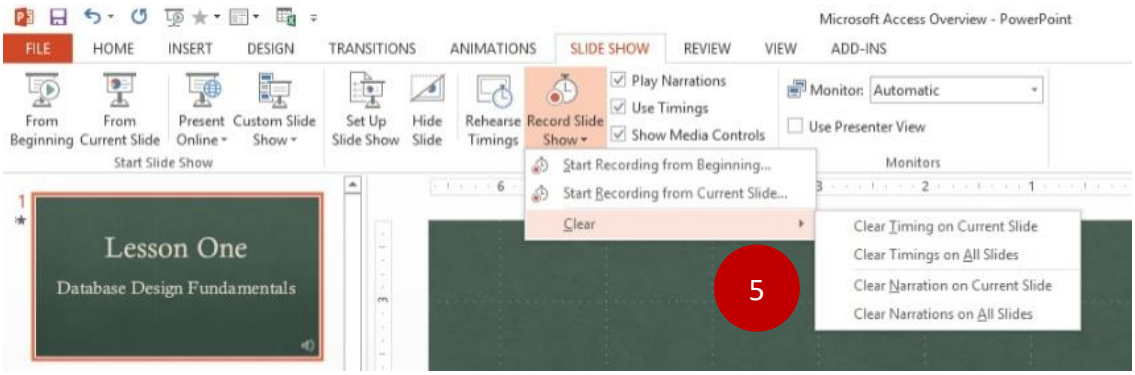
1. Write down what you will say before you get started. This will help avoid spending too much time re-recording your voice every time you make a mistake.

2. Plug the microphone to the computer, then click on the Slide Show tab and choose Record Slide Show; Record From Beginning. In this example we’re going to keep the Record Slide Show default settings; press Start Recording.

3. Speak into the Microphone and use the arrow keys to navigate through the presentation. Remember to not speak during slide transitions, as your voice will not be recorded during the transition from one slide to the next.

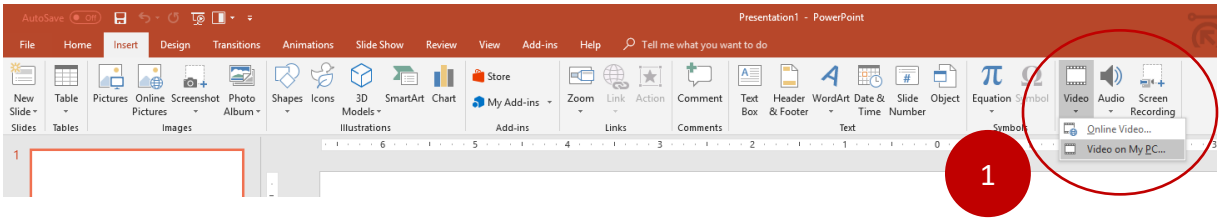
4. When finished, press the Escape key. Play back the presentation and re-record any of the slides that you are not satisfied with by clicking on the slide, then choose Record Slide Show, From Current Slide.

5. To delete the slide show recording from the presentation, click on the Record Slide Show button and choose what you want to delete from the Clear drop-down menu.

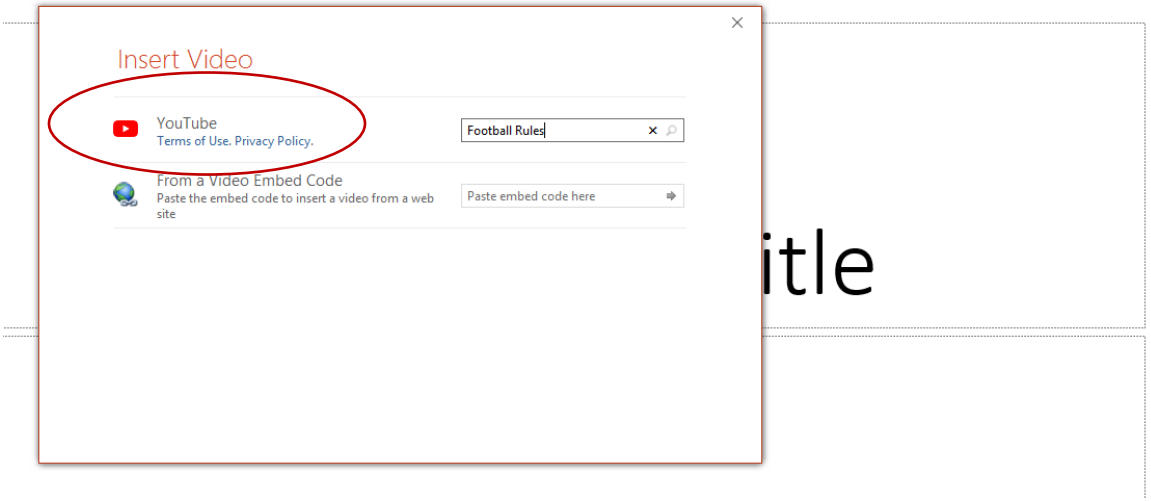


Using Video Clips

1. Click on the Insert tab, then click on the Video down arrow from the Media group.



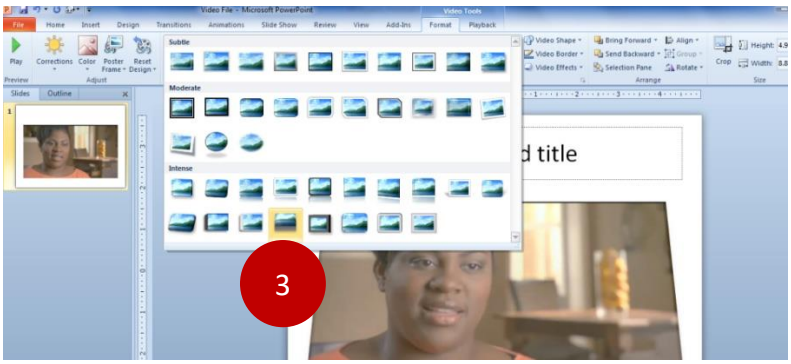
You can choose an Online video or a video file you have on your computer. The later versions of PowerPoint might display YouTube as an option for choosing an Online Video.



Let's say that we already have a video file saved on the computer; choose Video on My PC.

2. After the video file appears on the slide, click on it and then click on the Format tab from the Video Tools tab

3. Click on the down arrow from the Video Styles group and choose Relaxed Bevel Perspective from the Intense group.



4. Click on the image, then click on the Playback tab from the Video Tools group.

5. From the Video Options group, choose Start, then choose “On click” (if it’s not already selected). Click on the Volume drop-down button to make sure the Volume is set to “High”.

6. From the Editing group, click on the Trim Video button.

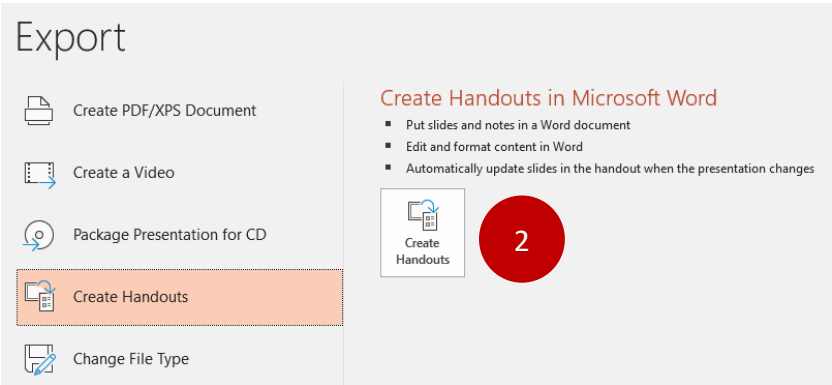
The video can be edited so that only a specific time frame is shown to the audience. This will prevent you from having to rewind and fast forward during the presentation. You can use the Red and Green markers to adjust the start and stop times on the video:

a. Set the Start Time to 00:070; press the Tab key.
b. Set the End Time to 0035.02; press the Tab key, click OK.

7. Play back the video to make sure it works.

Printing Handouts for your Audience

1. Click on the File tab and choose Export; choose Create Handouts.
2. Click on the Create Handouts button under Create Handouts in Microsoft Word.
3. Choose Blank lines next to slides; click OK.



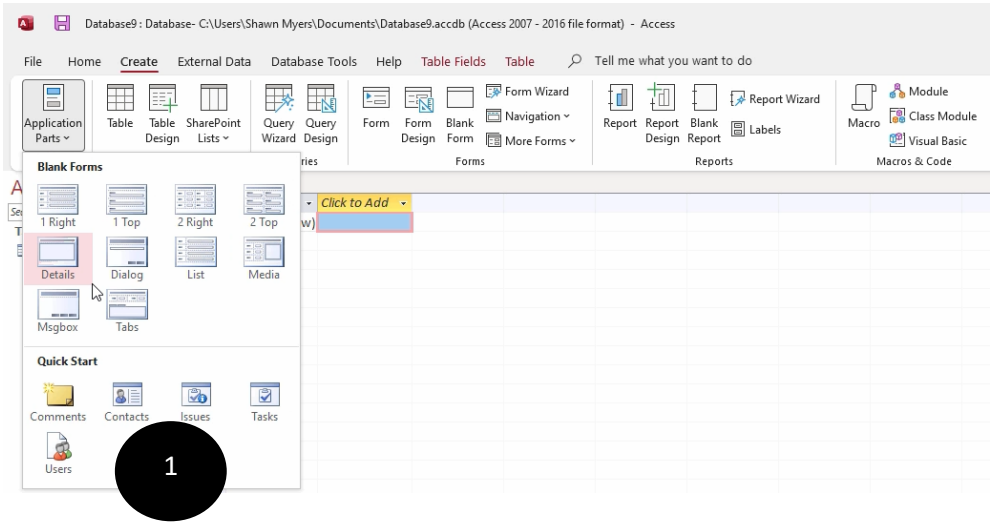
Database Design using Access

Topics Covered (New for 2021)

- Create and Design Tables
- Create a Query
- Create and Design Forms
- Create and Design Reports
- Export Reports to Excel

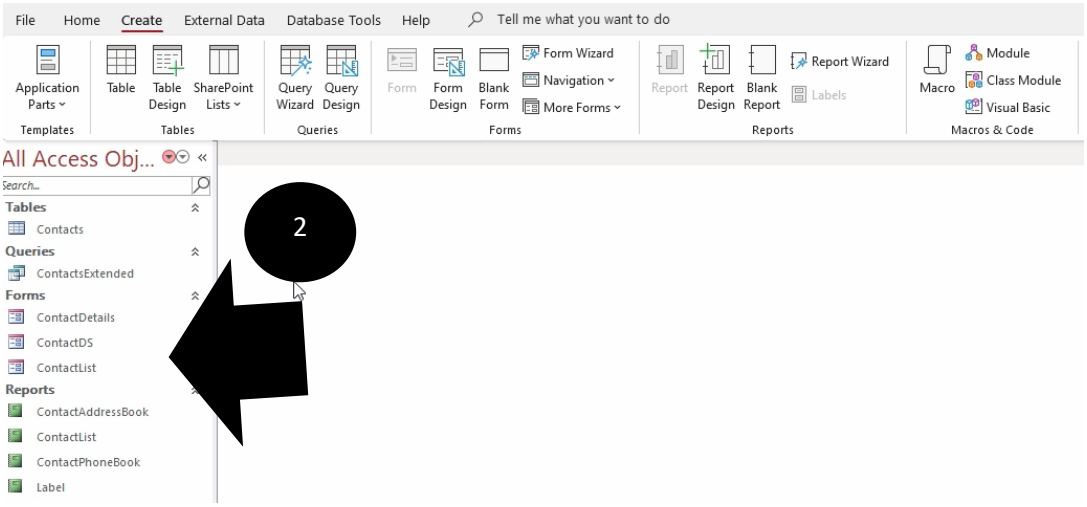
Lesson Two: Create and Modify Tables

1. Go to the Create tab, then click on the Applications Parts drop-down list from the Templates Group. Go to Quick Parts and choose Contacts.

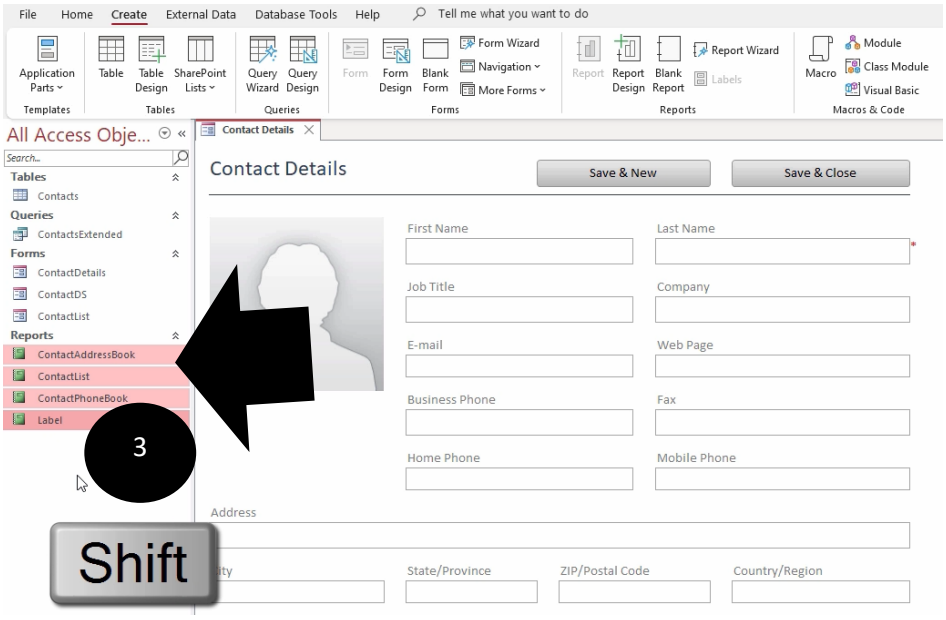


2. You will be prompted to close any tabs that are open; Click yes, then click Enable Content.

You will see that a table was created along with other Objects you might want to include in the database. Click on each Object to see what it looks like, then delete whatever it is that you don't need.

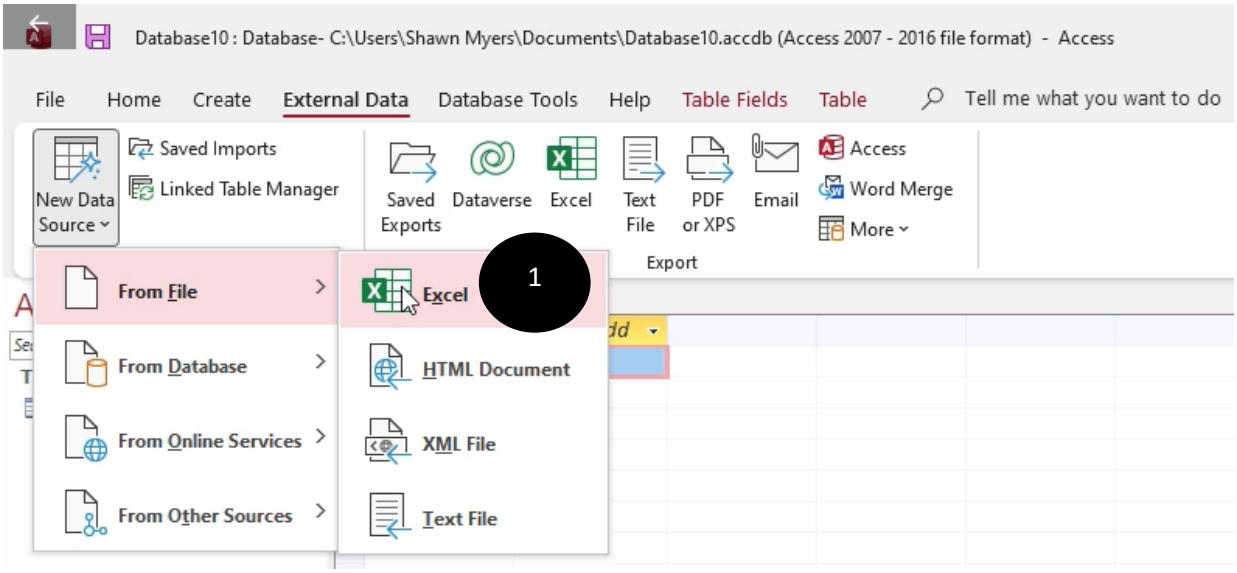


3. Let's say that we don't need to include any Reports. You can click on the first Report, hold down the Shift key, click on the last report, and then press the Delete key.

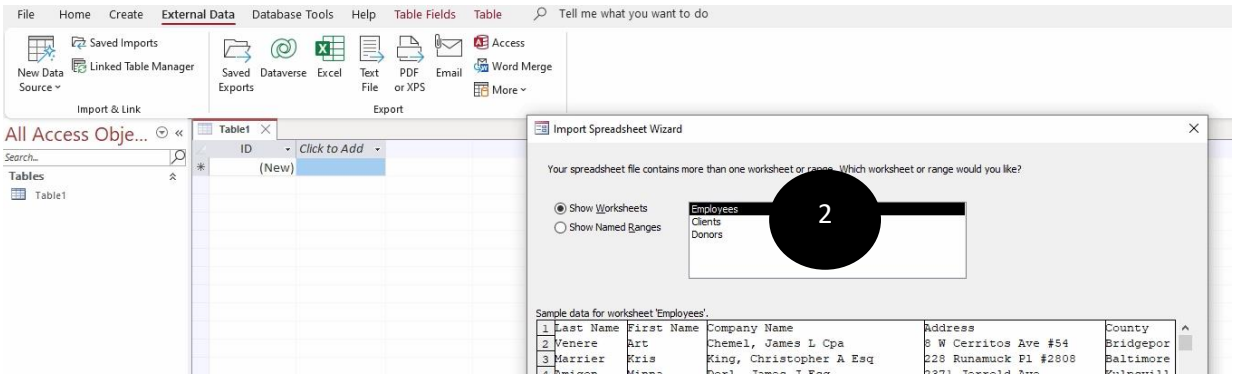


Importing Excel Files

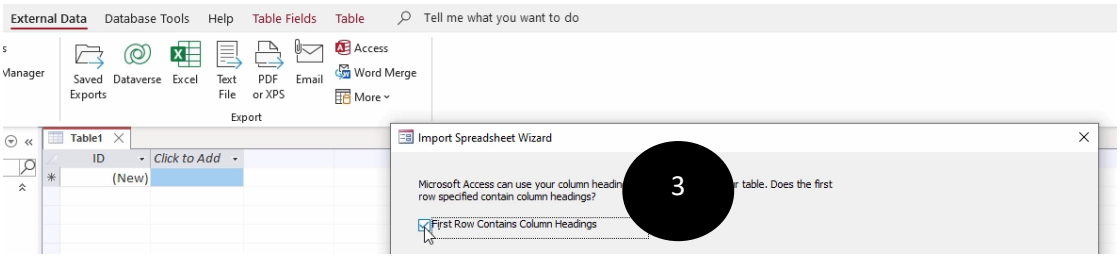
1. Open up a blank database. click on External Data, New Data Source, from file, Excel.



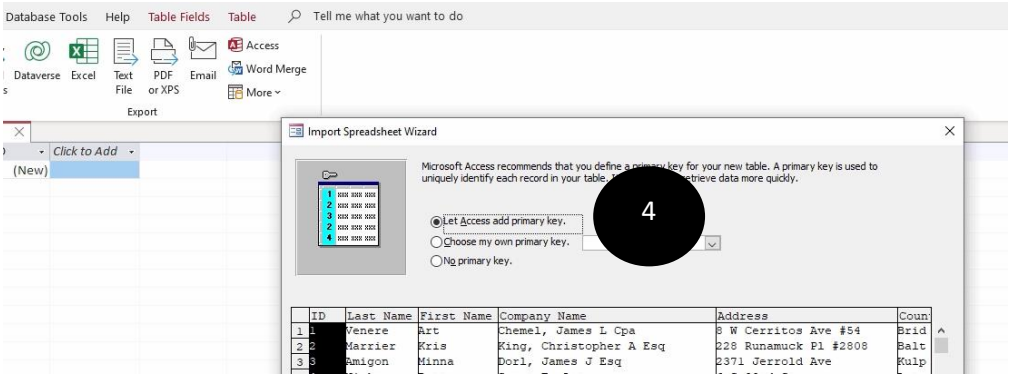
2. You will then be prompted to locate the file that you want to import. Click on the Browse button and double-click on the file. Click OK and then you see the worksheets that are on the file. Let's start with the first one, which is Employees.



3. Click Next, and let's check off where it says, "First Row Contains Column Headings". You will then be given the option to make any changes to the Field Headings.

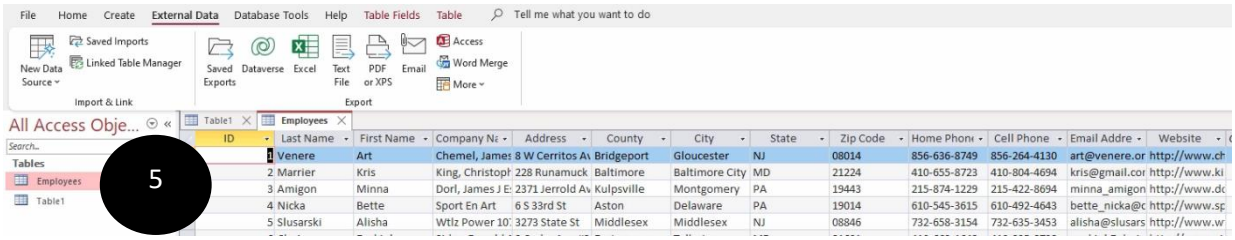


4. Let's keep the current settings and click "Next". You will then be asked about creating a Primary Key, which is something that uniquely identifies each record in the Table. For this database, let us use a Primary Key that will be created for us, because each record will be uniquely identified by a number. Click "Next".

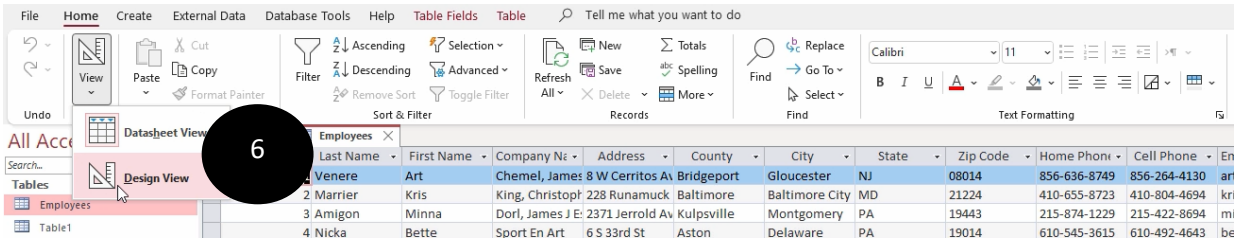


For this database, we don't need to save the steps so click on "Close".

5. Double click on "Employees" to open the Table; and you'll see all the entries. Right now, the Tables is in what is called Datasheet View.

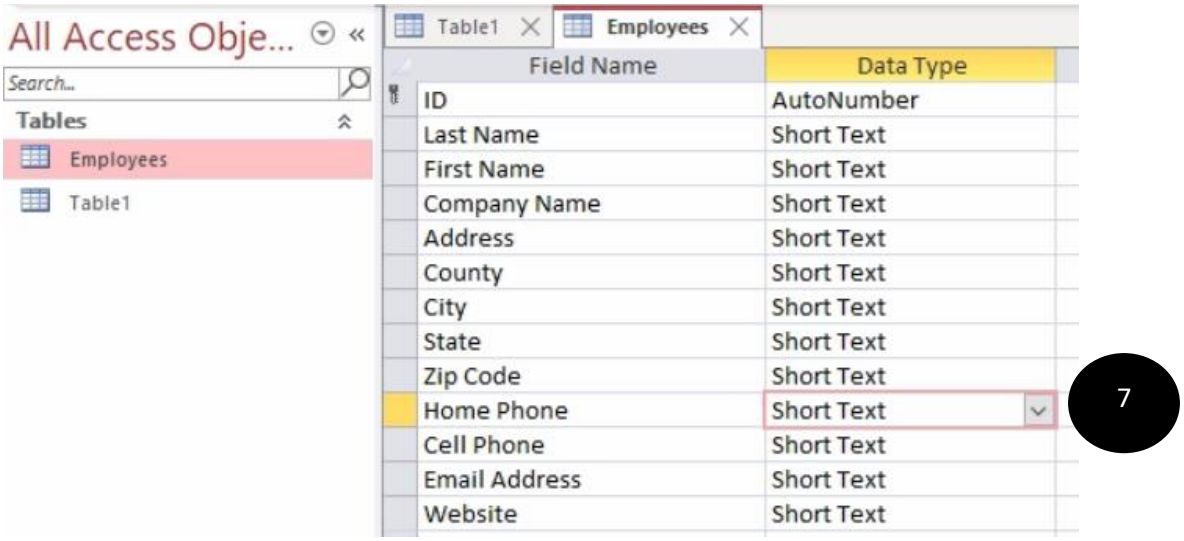


6. When you go to the Home tab, and then click on "View", you will see another option called Design View.

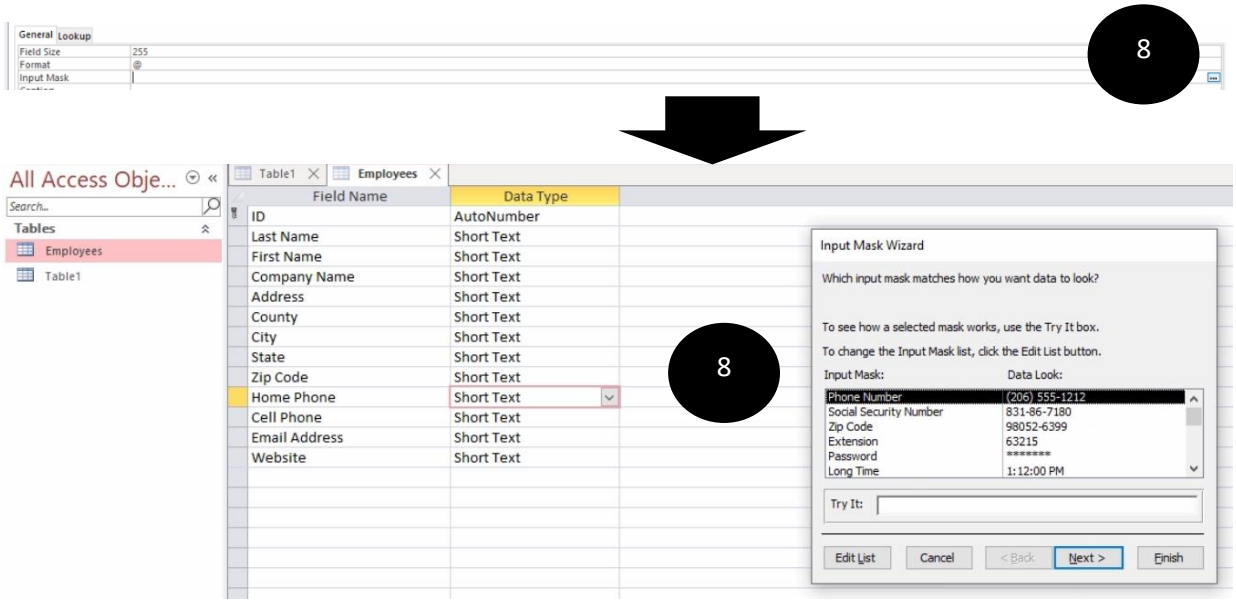


This allows you to add more Fields and control the way the records are formatted by assigning was called a Data Type.

7. Click on the Data Type next to the phone number. Each Data Type can be customized using options under what is called "Field Properties"

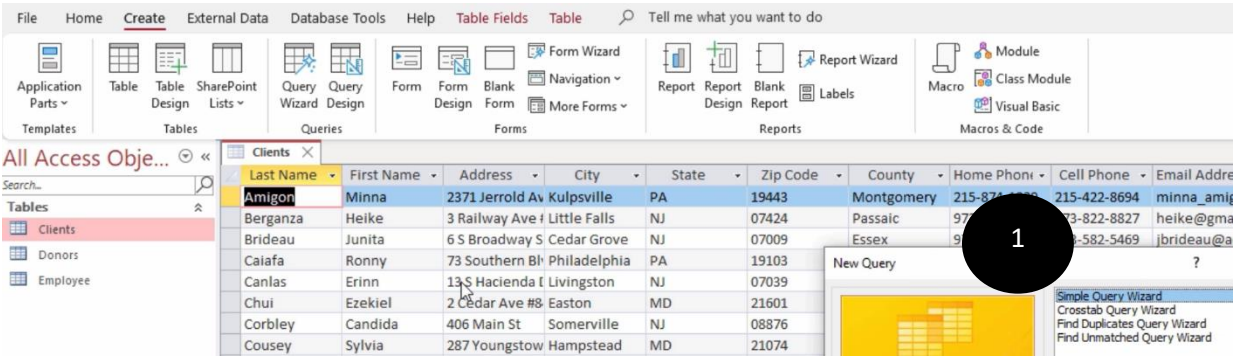


8. We can then click on what is called an Input Mask, which allows you to apply a format every time a record is entered into the database under that Field. We can click on the ellipsis next to the Input Mask and you will see a phone number input mask. Click Finish.

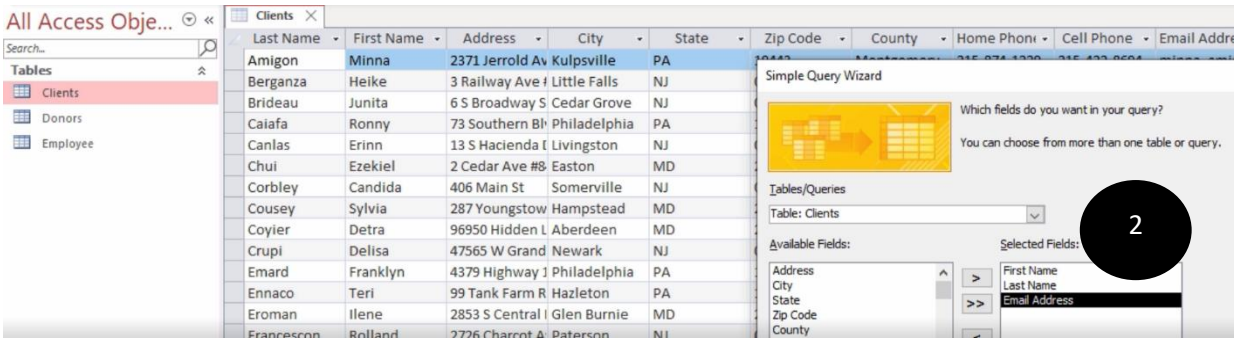


Lesson 3: Create Queries and Export Files to Excel

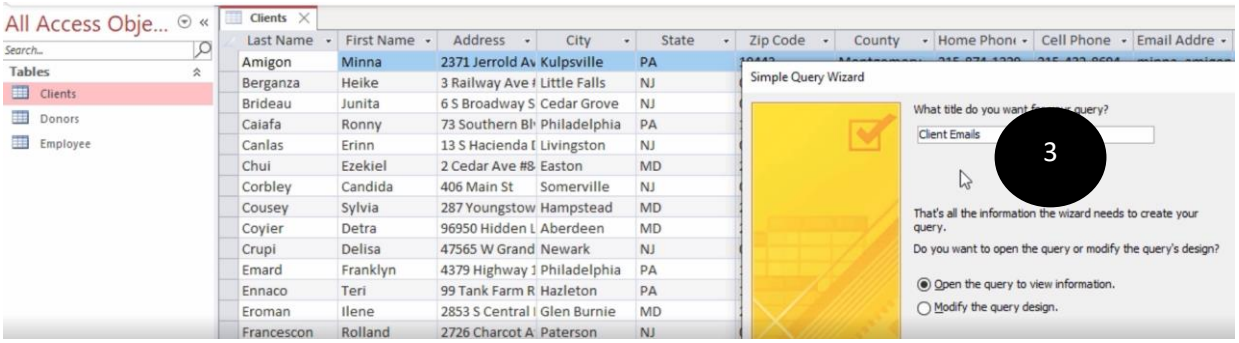
1. Go to the Client Table, then click on the Create tab and choose Query Wizard from the Queries Group. Choose Simple Query.



2. From the Query Wizard dialog box, choose First Name, Last Name and e-mail address.

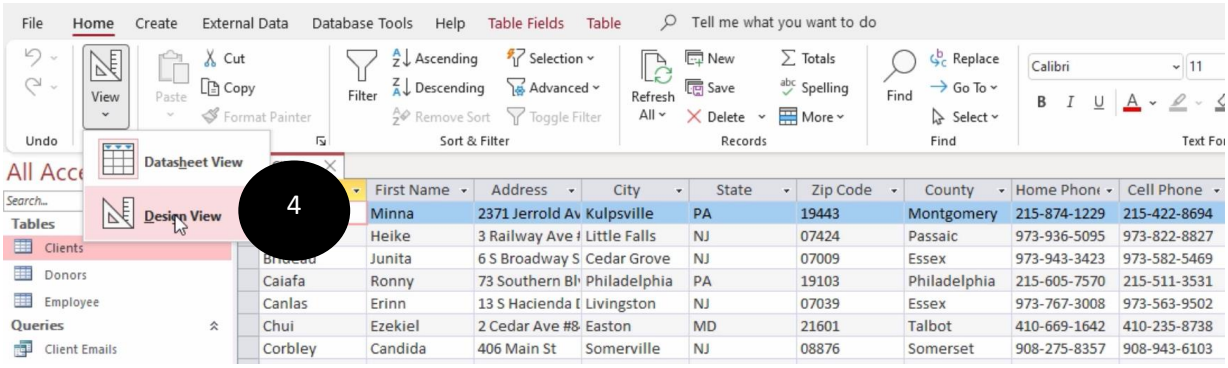


3. Click Next and rename the Query, “Client Emails”; then click Finish.

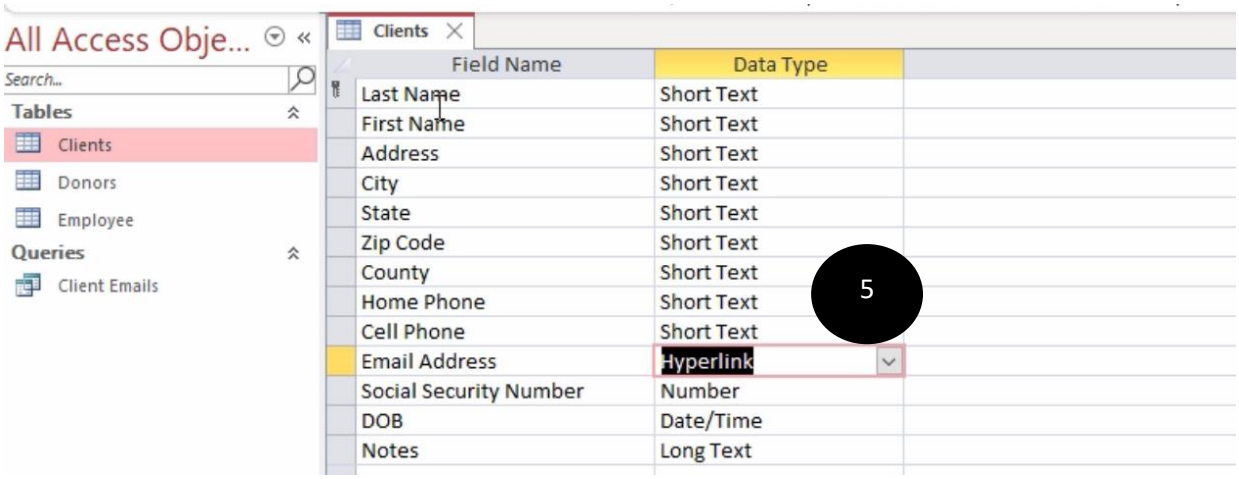


Let’s expand the column so it is easier to see. Save it, then close all the tabs.

4. Click on the Client Table, then click on Design View.

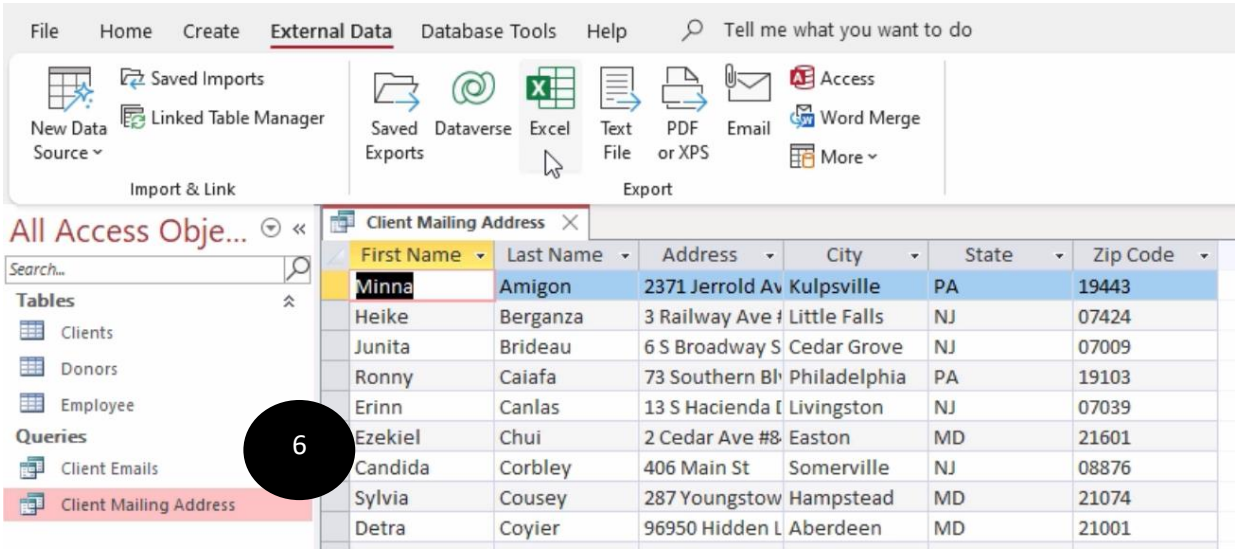


5. In Data Type, use the down arrow to change it to Hyperlink. Then right-click on the Clients tab and save it; then close it.

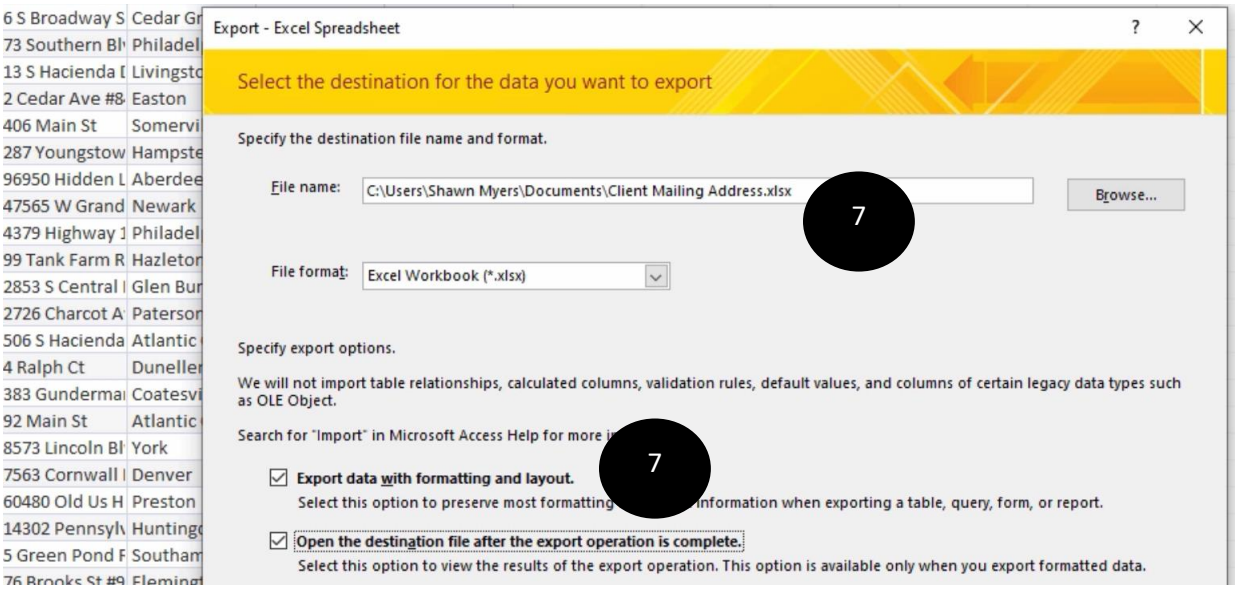


Exporting data to Excel

6. Double-click on the client mailing address Query, click on the External Data tab, and choose Excel under Export.

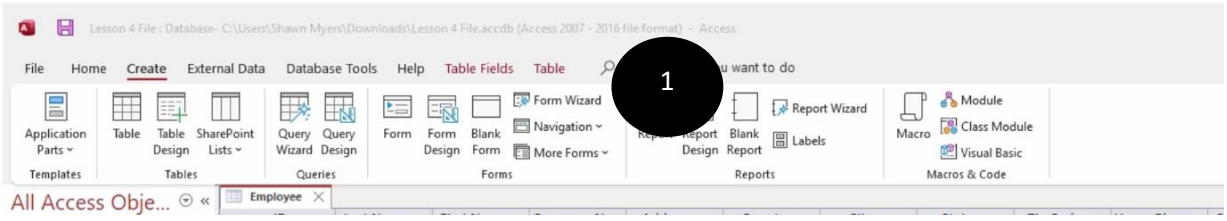


7. Under “Specify the file name and format”, choose a location for where you want the file to be exported to. In this example, the file location is already selected. Under “Specify export options”, check off the “Export data with formatting and layout” and the second option that opens up the file after it has been exported; click OK.

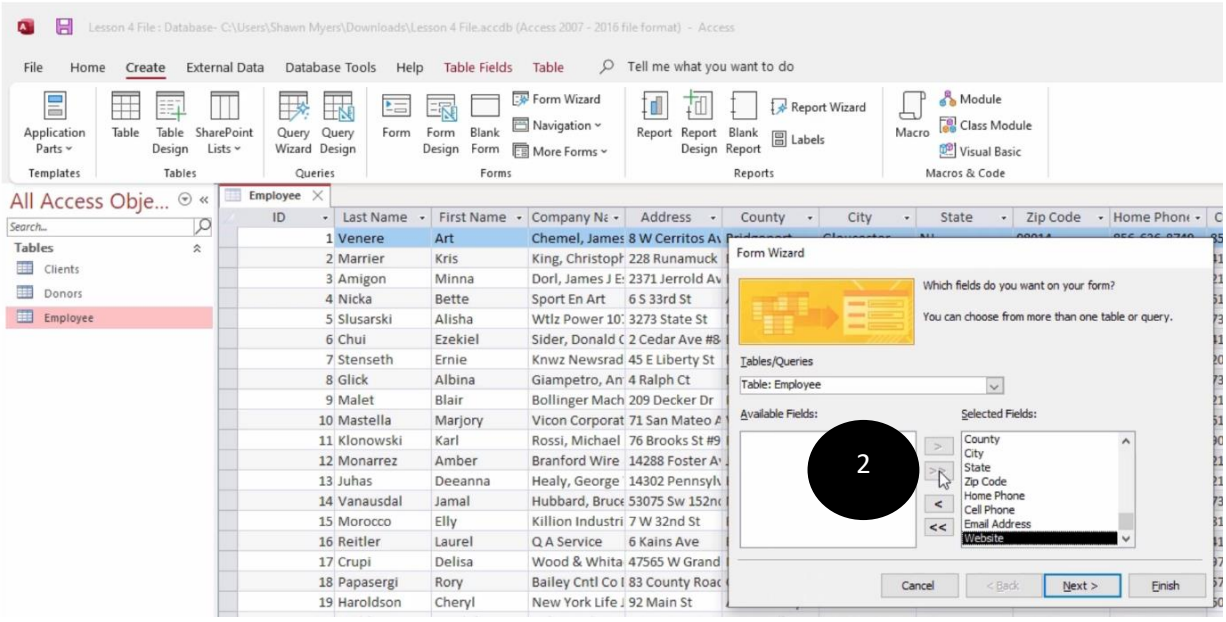


Lesson 4: Create a Form

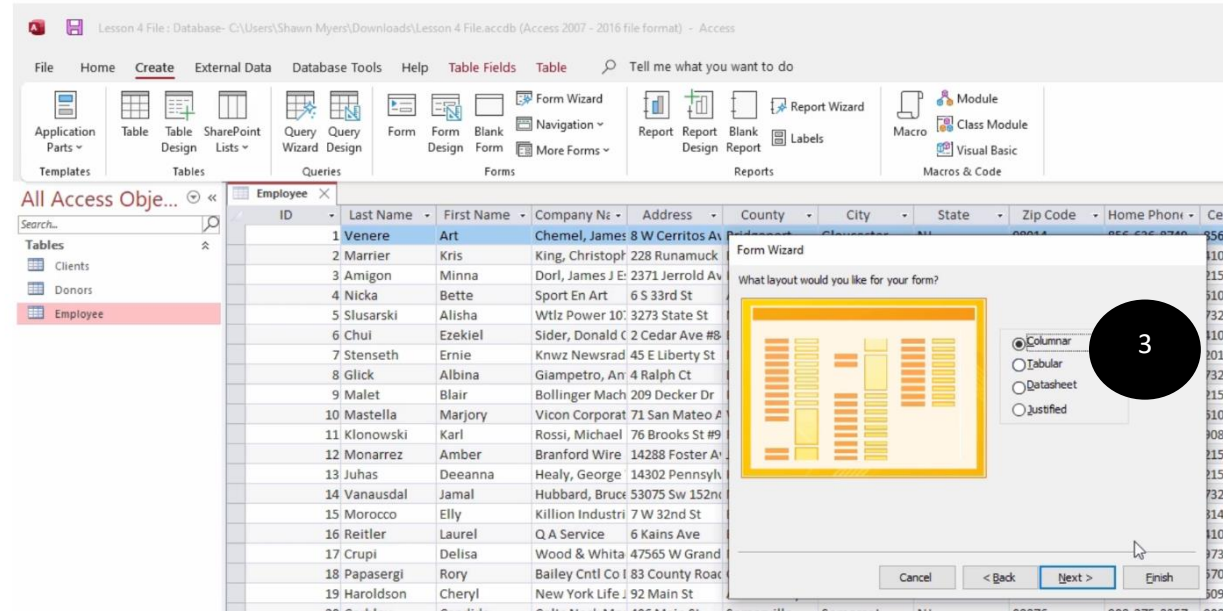
1. Double-click on the Employee Table. Click on the Create tab and go to the Form Wizard.



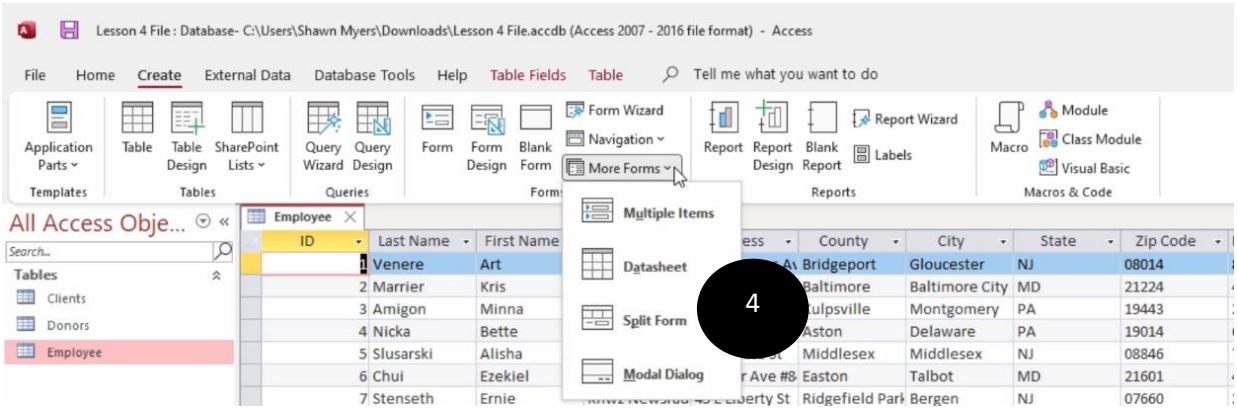
2. Click on the two arrows to select all the Fields, then click Next.



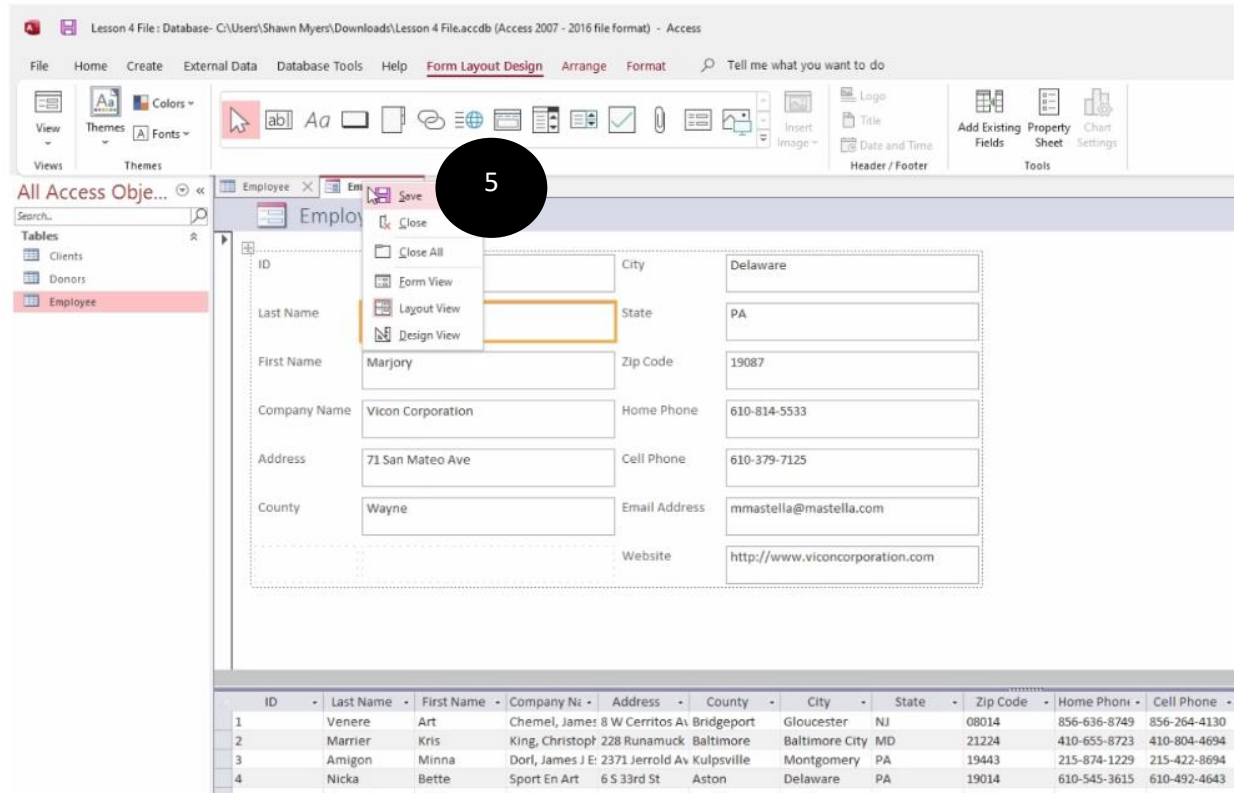
3. Keep the first layout option, then click Finish.



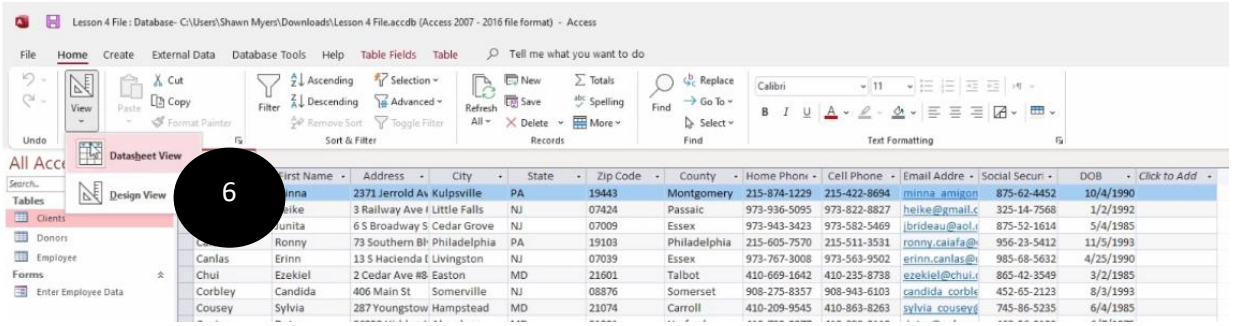
4. Another way to create a Form is to click on the Table and then choose one of the templates. Go to More Forms and click on “Split Form”



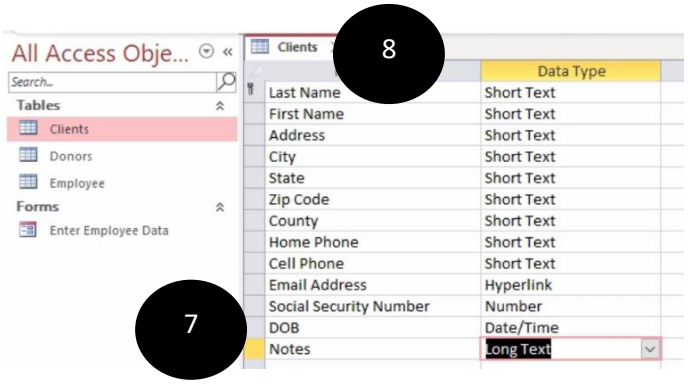
5. You can see that this template creates a form that shows you one record at a time; and also shows the entire table. When you click on each record, it is displayed in the form. Right-click on the Form icon, and then click Save. Name the form “Enter Employee Data”.



6. Let's look at another way to create a new Form. Double-click on the clients Tab, and from the view down arrow choose Design View.

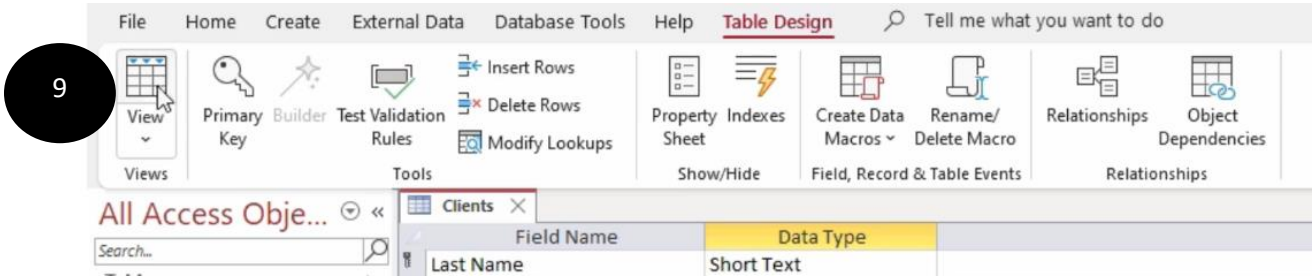


7. Click on the blank space under Field Name and type in the word, "Notes". Press the Tab key, and under Data Type choose Long Text and that gives us a new Field. Anyone that wants to use the form to type in notes, or copy and paste text from another application has a space to do it.

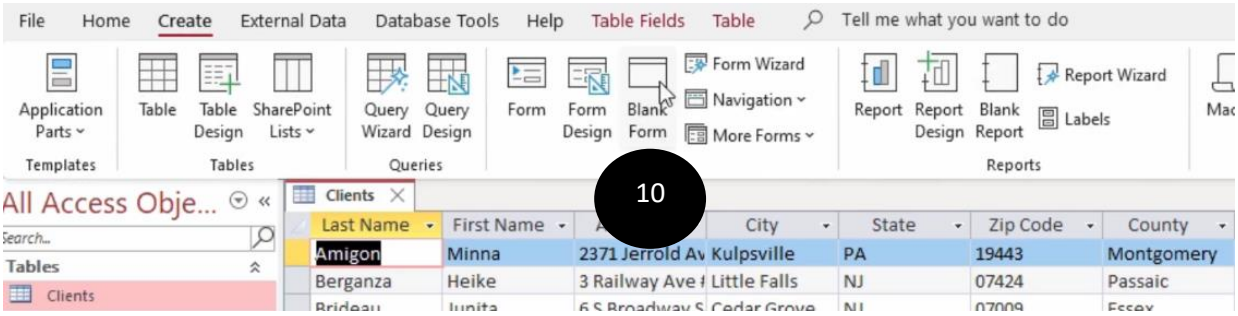


8. Right-click on the clients Tab and click Save.

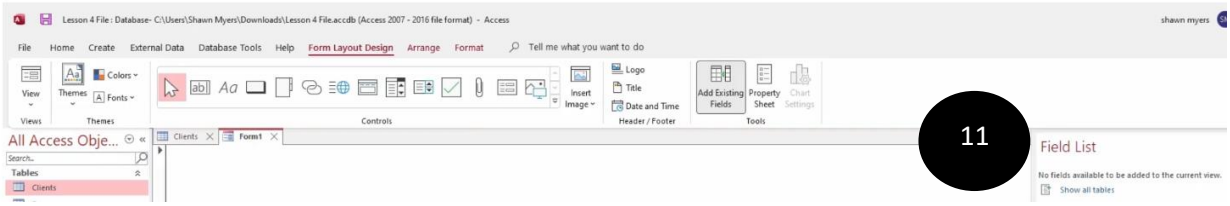
9. Click the top portion of the View button to go back to the Data Sheet view.



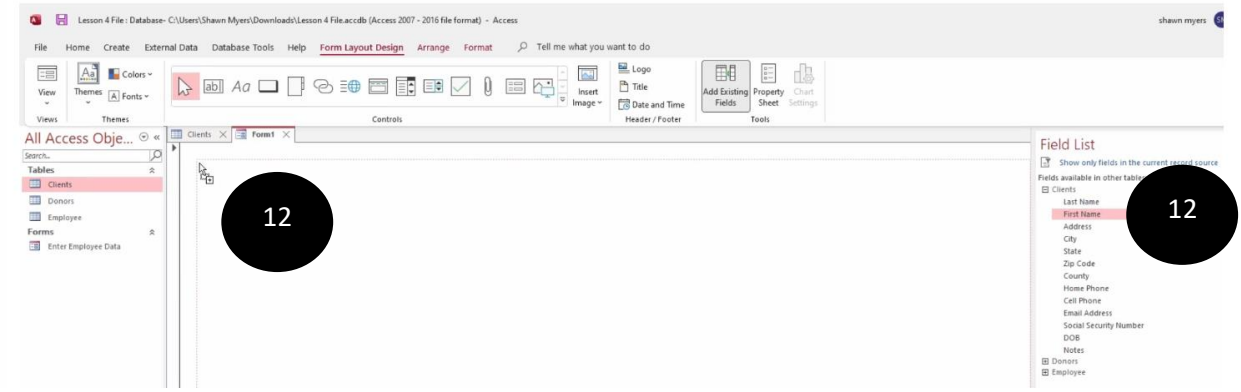
10. Go to the Create t ab and choose Blank Form



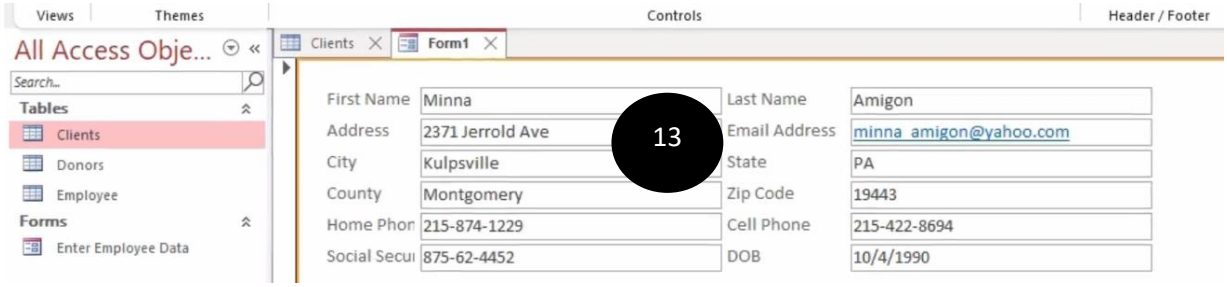
11. This opens the Form Layout View. Click on “Show All Tables” under Field List



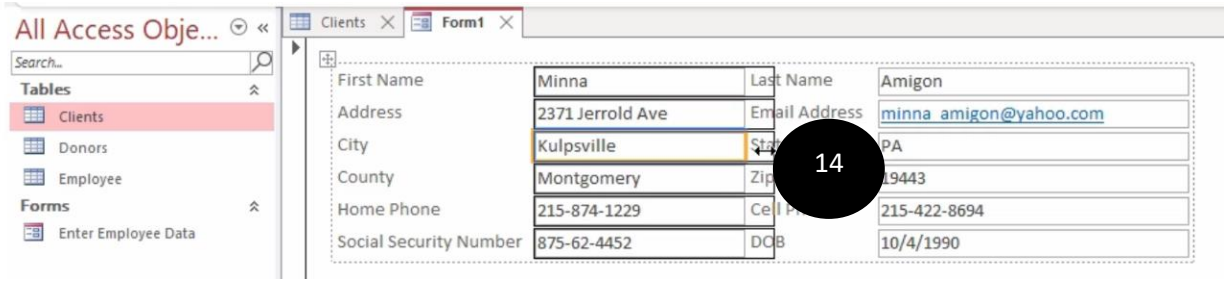
12. Click on the plus sign next to the Clients Table; then click on the first name and then move into the upper left corner.



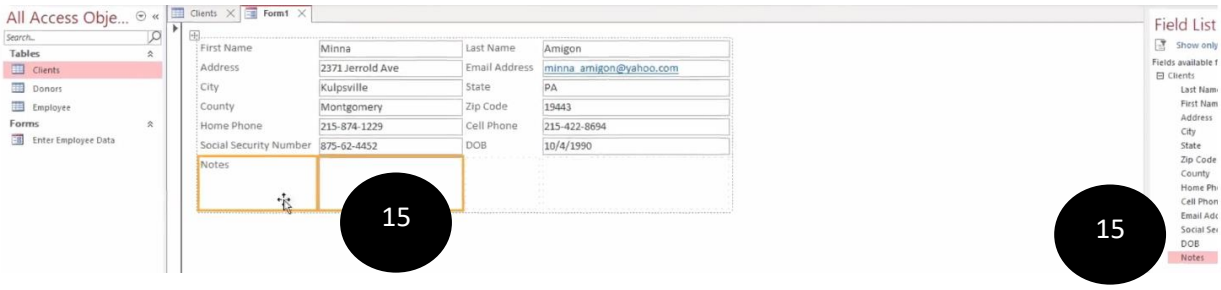
13. Move the last name next to the first name. Repeat the steps to finish completing the Form.



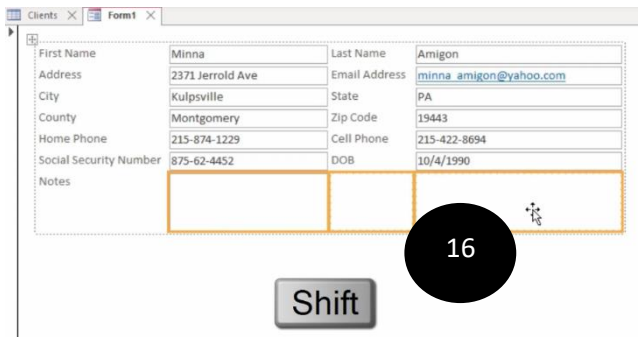
14. After you finish adding the rest of the contact information you can left click on the place holders, use the mouse to adjust the spacing between the fields.



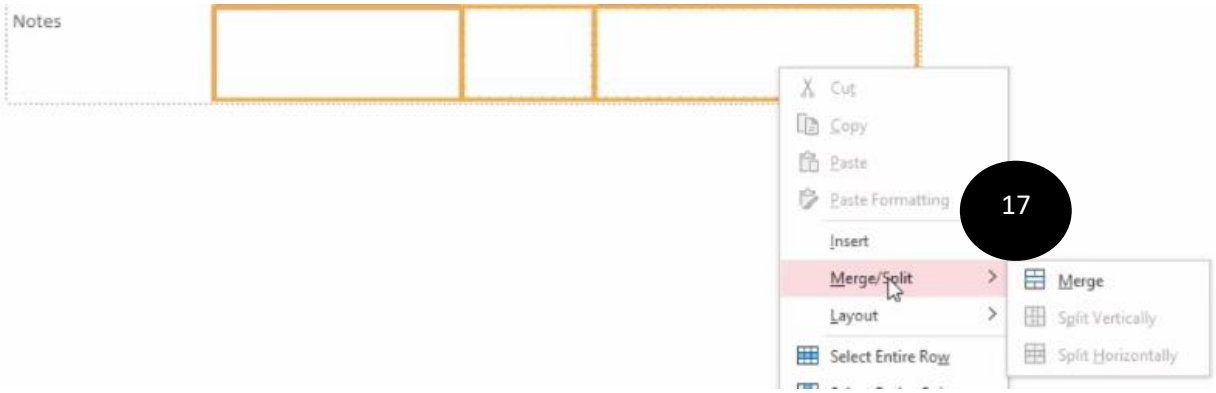
15. Add a Notes field and place it right underneath the social security number.



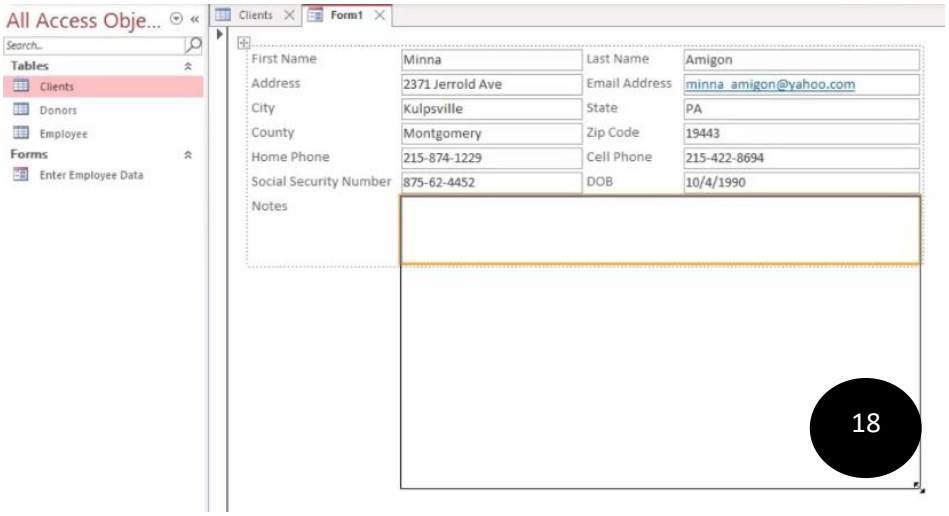
16. Make the space for the Notes wide enough, so that the user can type in notes or copy and paste text from another application. Click on the first placeholder, hold down the shift key, then click on the other two placeholders.



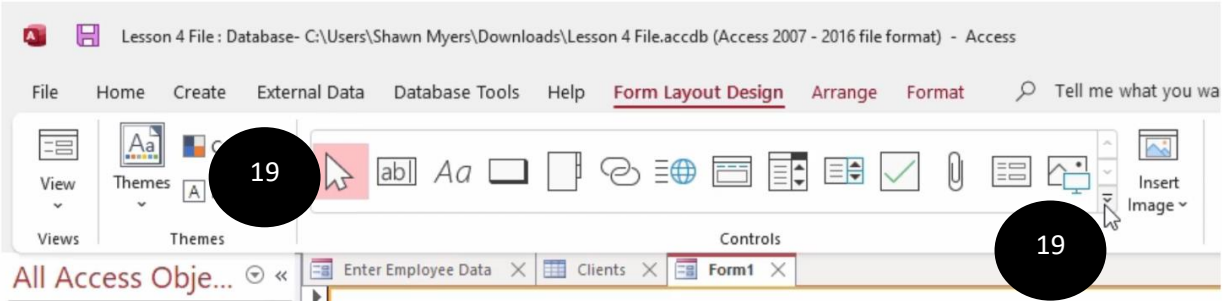
17. Right-click and choose Merge.



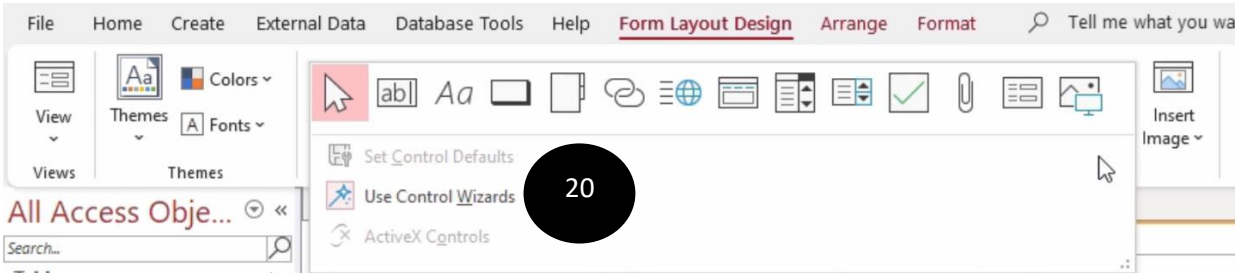
18. Then position the mouse over the lower right corner and then move it down to make it longer



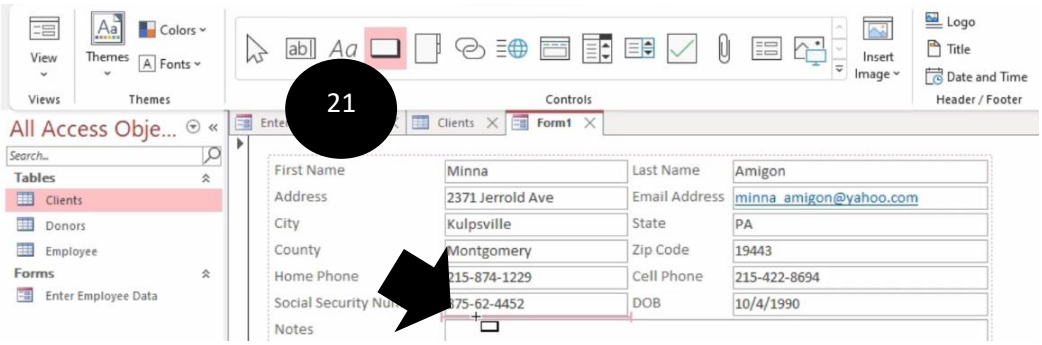
19. Let's now add something called Command Buttons. First, make sure that the Select button is activated. Then click on the down arrow in the Controls group.



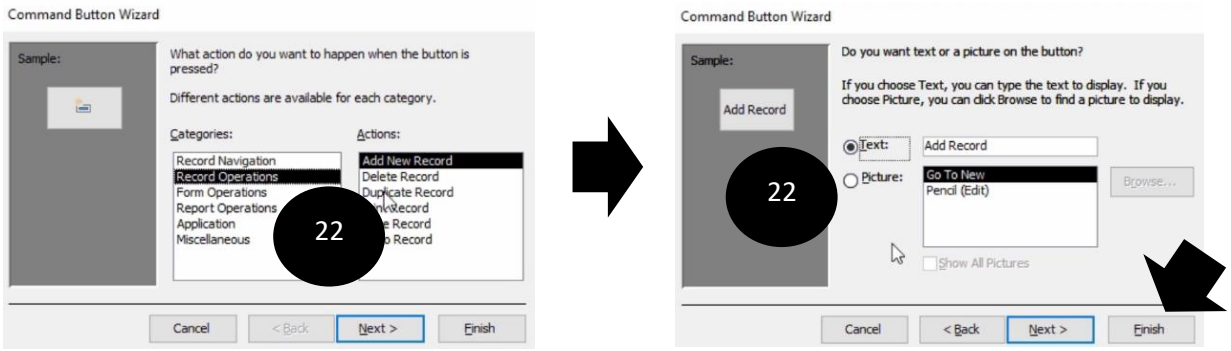
20. Make sure that the Use Control Wizards button is activated. You will know it is active when you see the button shaded and highlighted in red.



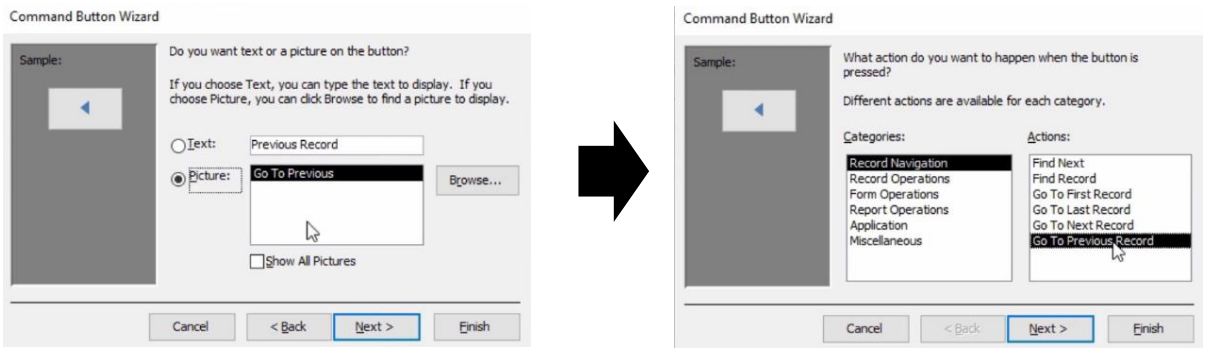
21. Click on the Button in the Controls group, then position the Button icon just above the Notes Field.



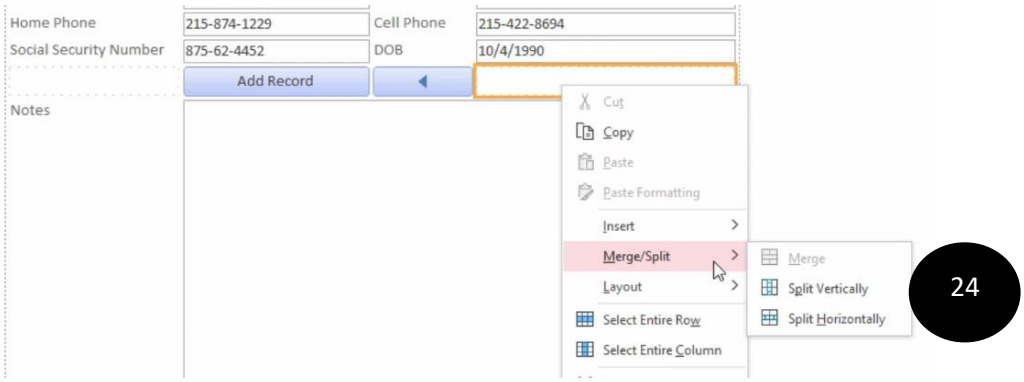
22. The Command Button Wizard will open. Under Categories, click on Record Operations. Under Actions, click on Add New Record if it is not already selected. Click on Next. Choose the option to display text and then choose Finish.



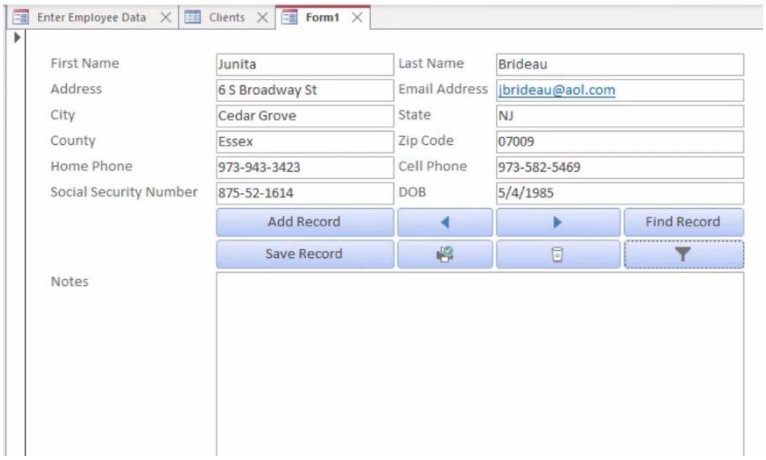
23. Repeat these steps to add a command called, “Go to Previous”. Let’s use a picture instead of text for the Command button; click Finish.



24. Let’s add space for two new buttons by clicking on the placeholder, right-click and choose “Split Horizontally” under Merge and Split.

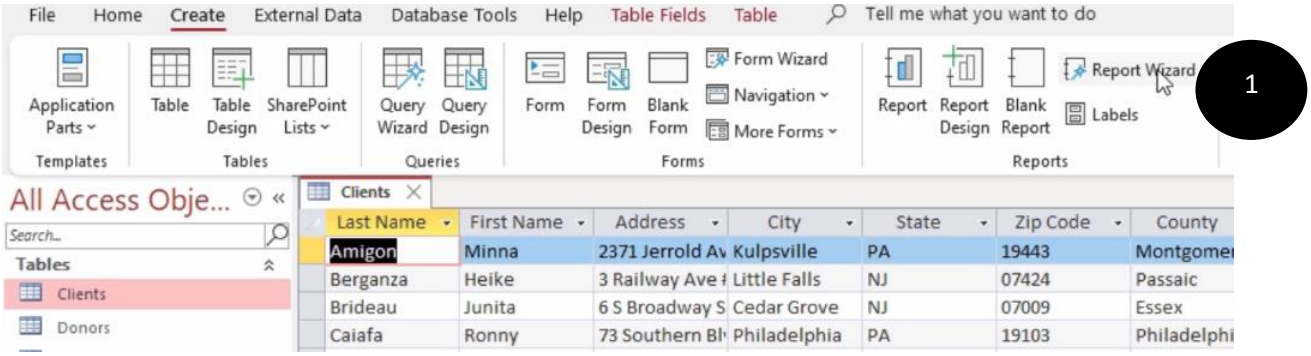


25. Add two more buttons. One for Go to Next Record; and another one for Find Record. You can continue to add additional buttons as needed. Here is what the Form looks like with a total of eight buttons:

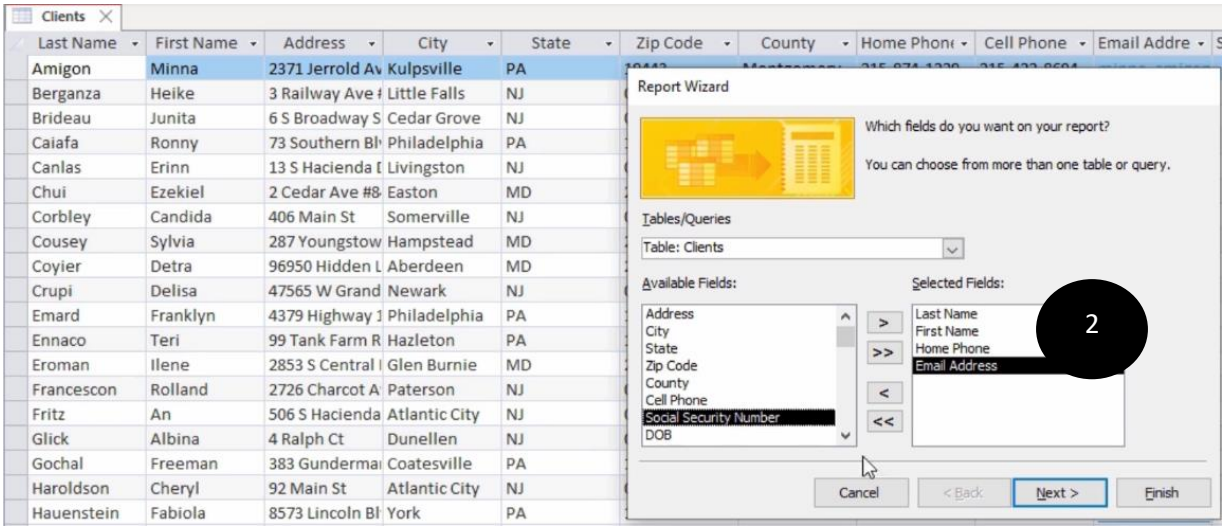


Lesson Five: Create and Modify Reports

1. Click on the Clients Table, then click on Create. Go to the Reports group and click on Report Wizard.

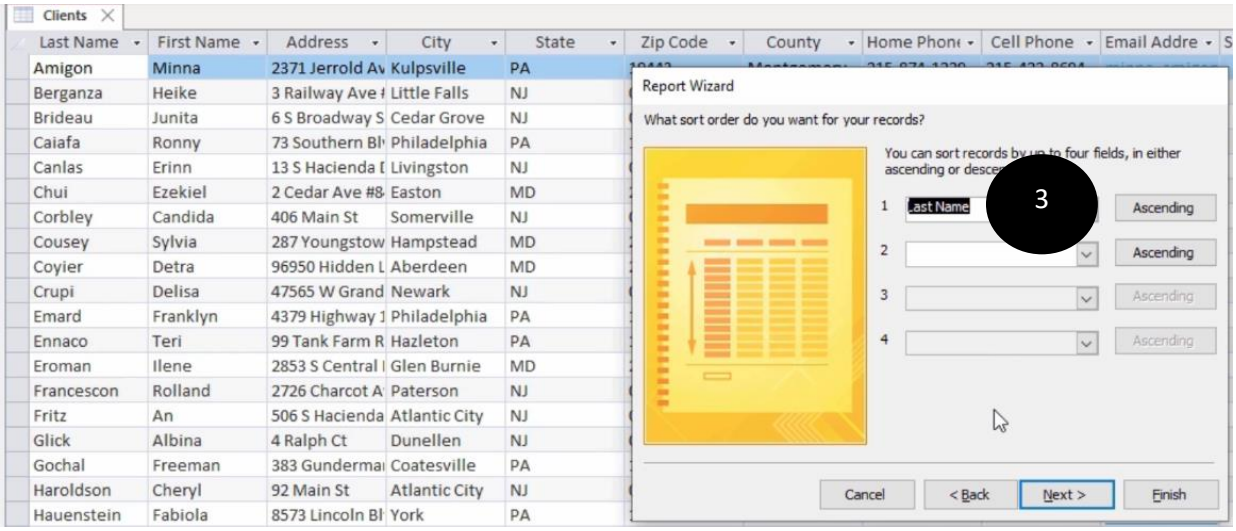


2. Double-click on Last Name, First Name, Home Phone and E-Mail Address; click Next.

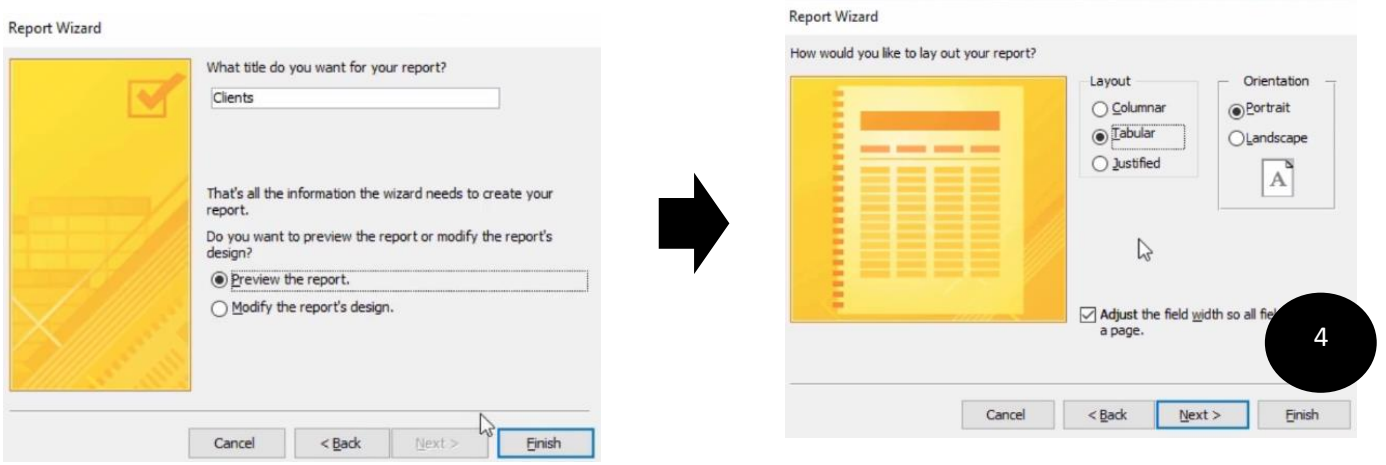


The Report Wizard gives you the option to organize the data into groups, which is not something we need to do for this report; click Next.

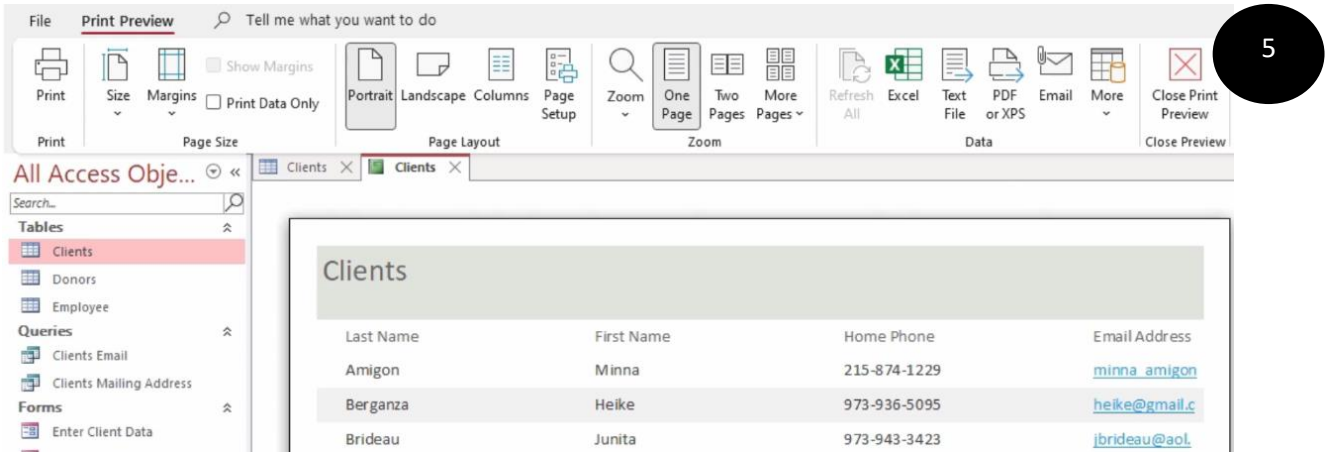
3. You have the option to sort the data in ascending order which of the A-Z; choose Last Name. Click “Next”.



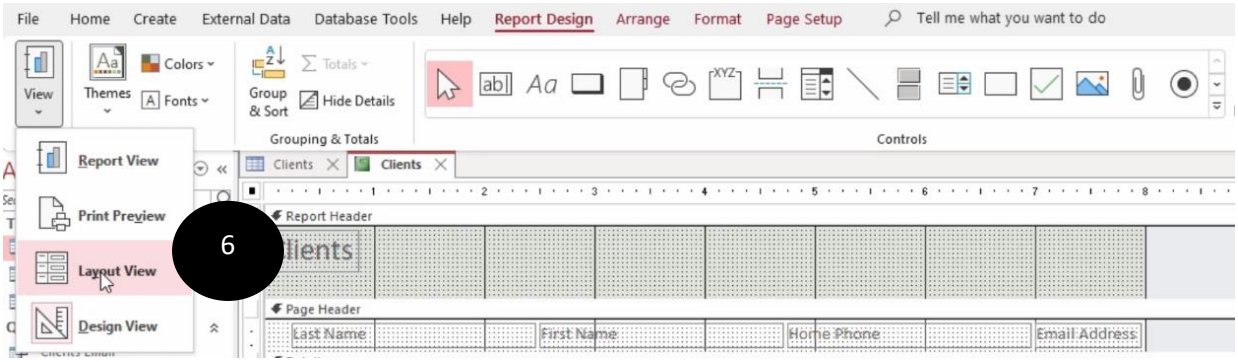
4. Choose a tabular layout option; click Next. Click Next again, then click on Finish.



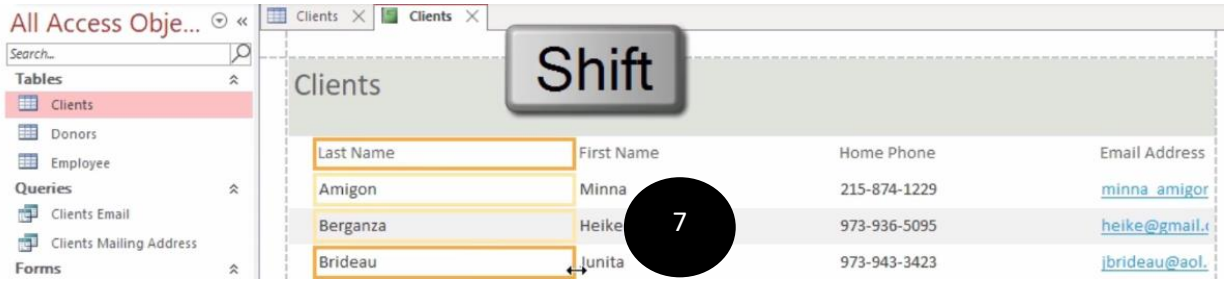
5. From here, you can see what the report will look like as a printed document. Click on the Close Print Preview button.



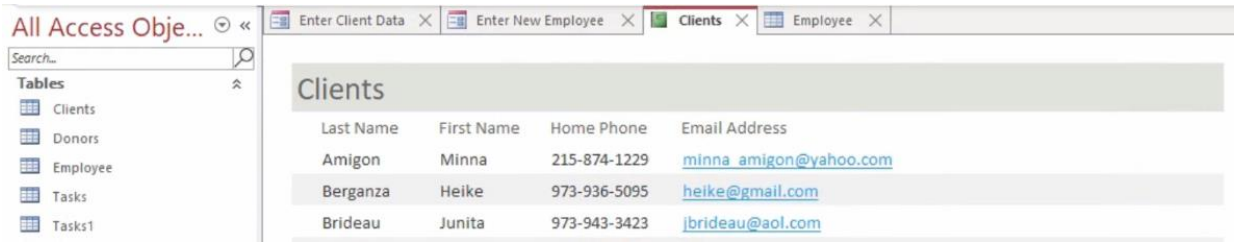
6. Click on the View button down arrow and choose Layout View.



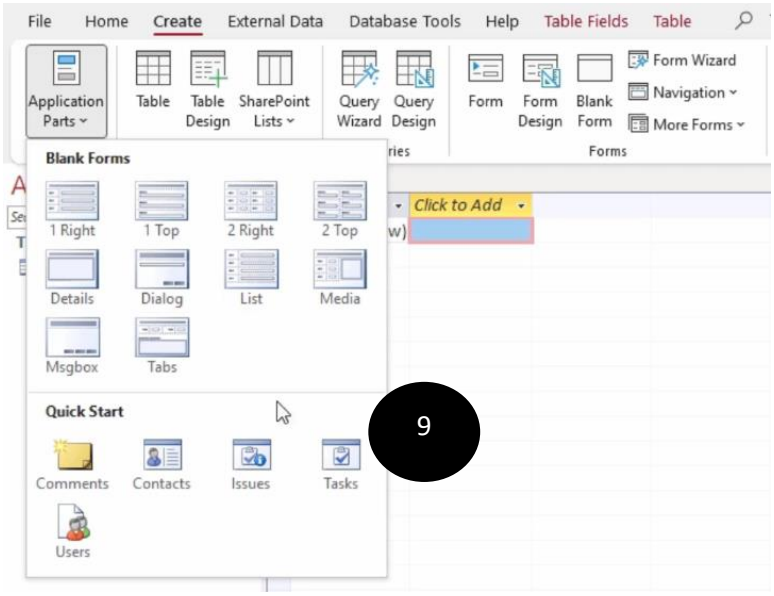
7. This view allows you to change the positioning of the columns. Click on the Last Name column heading, hold down the Shift key, and then click on one of the names in the Column (Brideau, for example) and then use your mouse to reduce the width of the column by moving it to the left.



8. Repeat these steps to adjust the width of the remaining three columns, so that it looks similar to this:

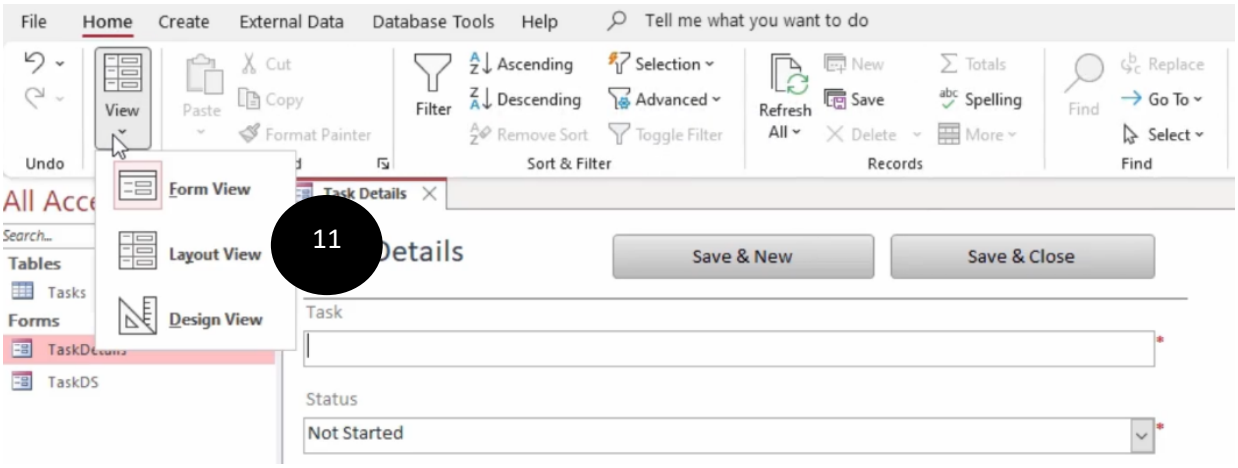


9. Let's create a new table by going to the Create tab, go to Application Parts and under Quick Start, click on Tasks.

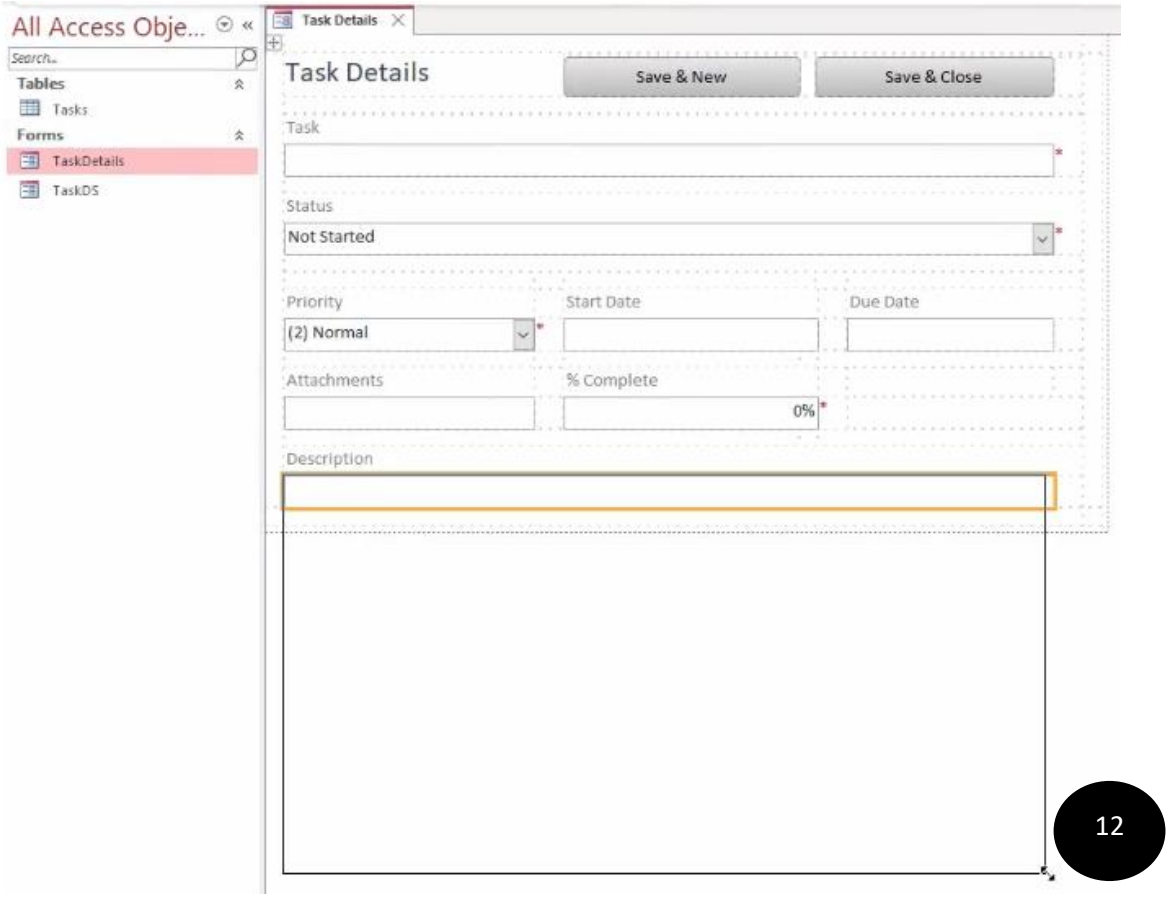


10. Click on Enable Content. Double-click on the TaskDetails form

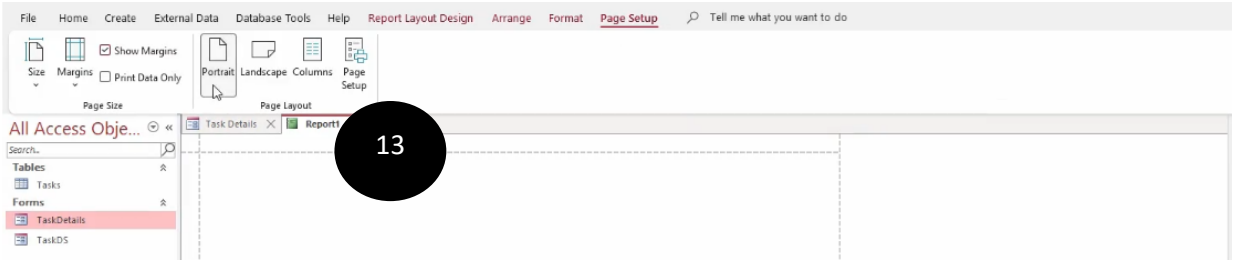
11. Click on the Home tab. Click on the View down arrow, then click on Layout View.



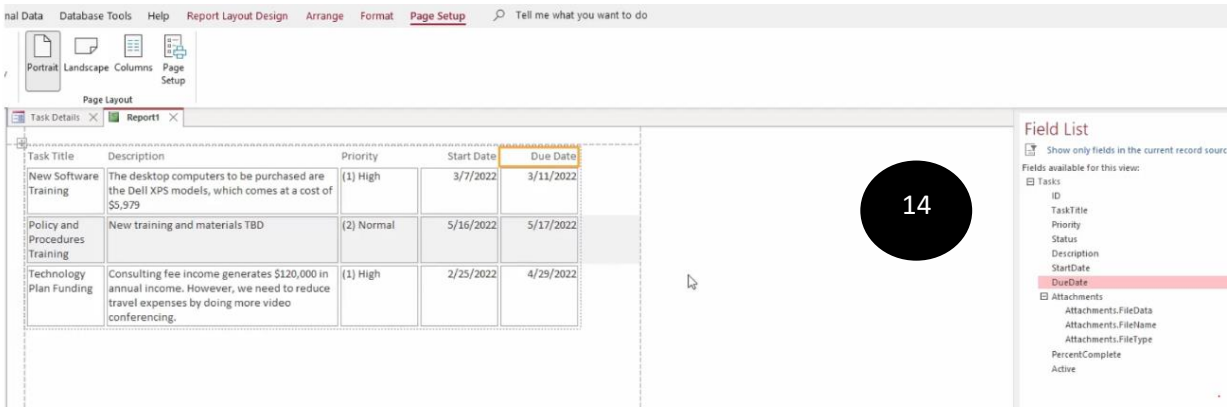
12. Go to the Description field, and make it a little longer by clicking on the lower right side and using your mouse to move the line downward.



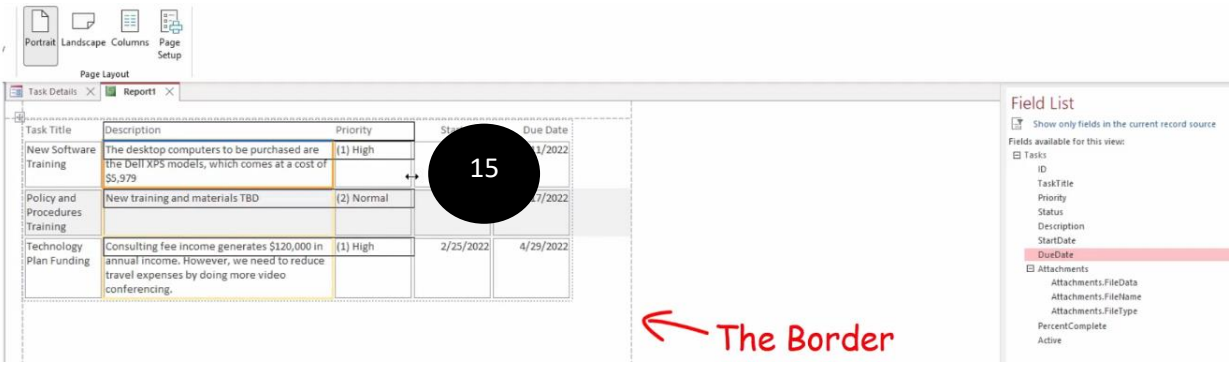
13. Let's create a report that summarizes all of the projects. Click on the Create tab. With the Report Layout tools tab selected, click on Blank Report and choose Portrait.



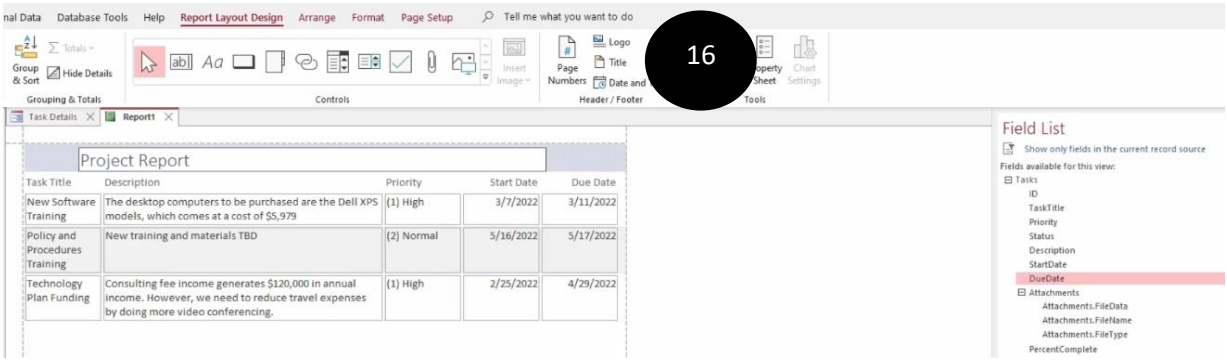
14. Click on "Show all tables", then click on the plus sign and let's add Task Title, Description, Priority, Start Date and Due Date.



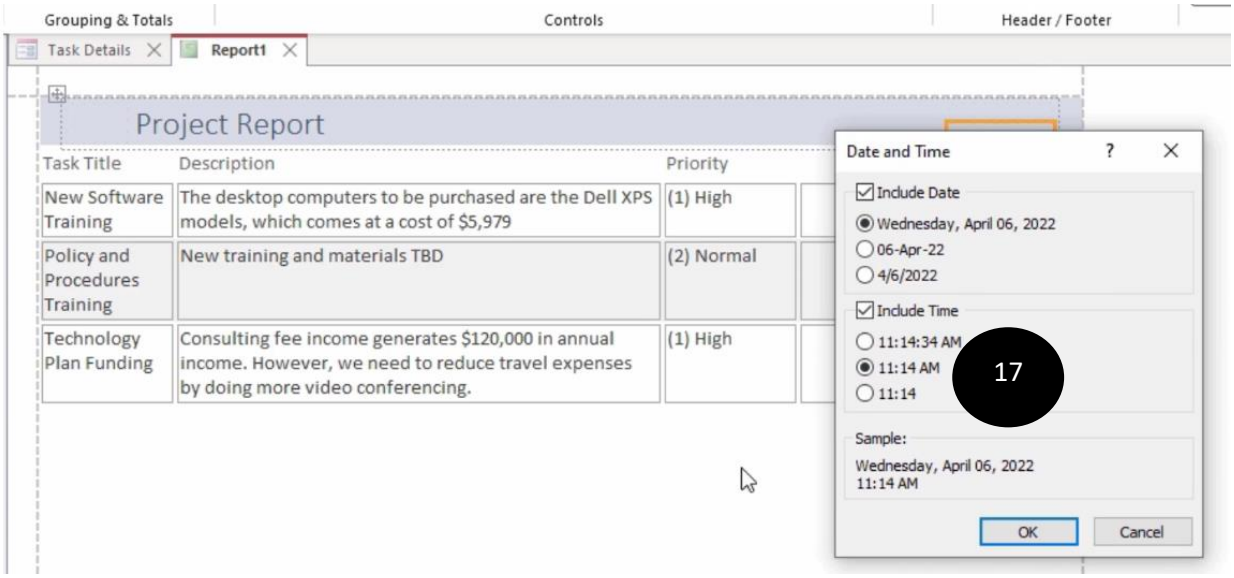
15. Position a mouse to the right side of the description and make it a little wider. Make sure that all the fields are still inside the border.



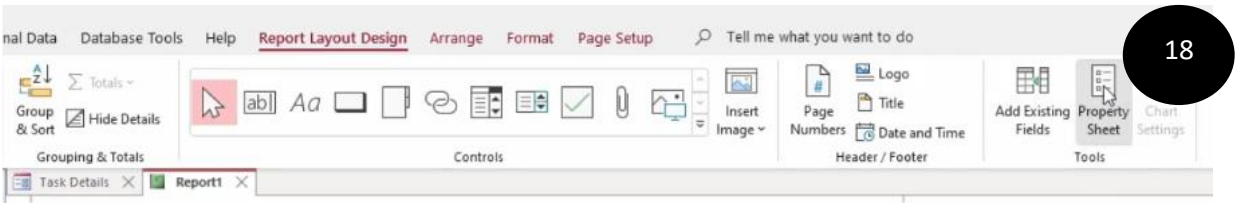
16. Click on Report Layout Design, then click on Title; and let's name it "Project Report"



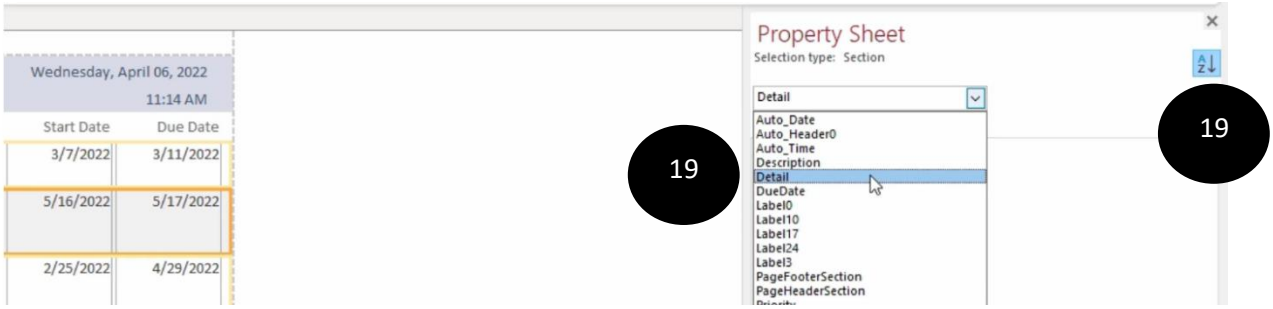
17. Click on the place holder on the right side of the report, then click on Date and Time. Check off the second option under Time; click Ok.



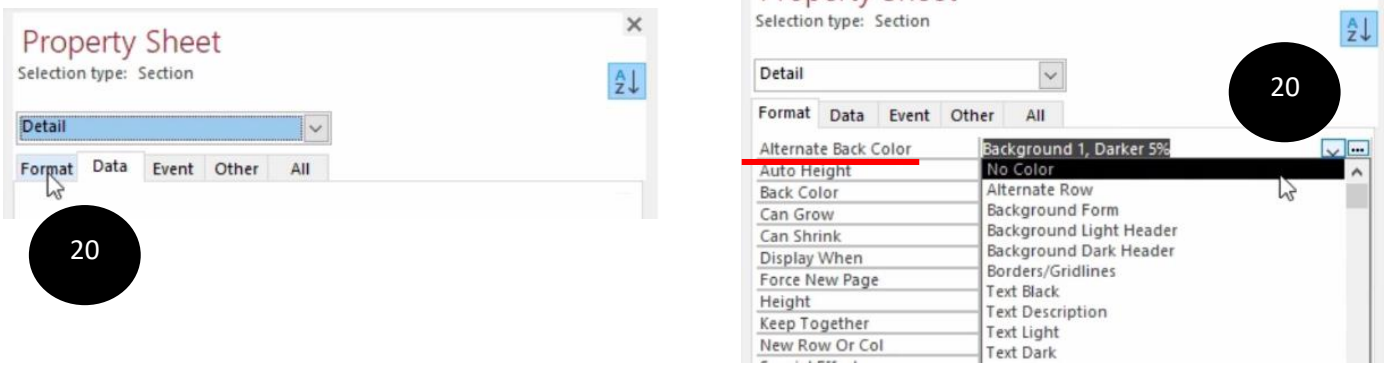
18. Close the Field List, then click on Property Sheet.



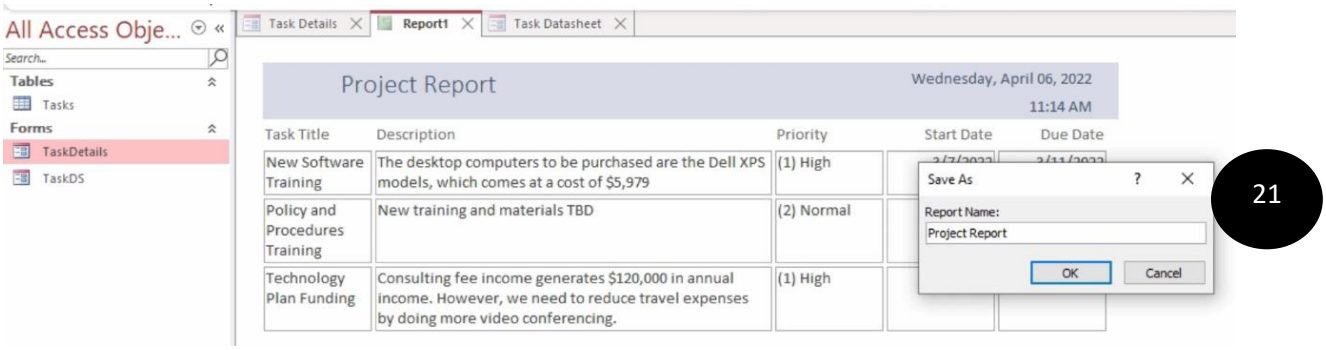
19. Click on Sort AZ under Format, then click just outside the Report and make sure you see “Detail” under Section Type.



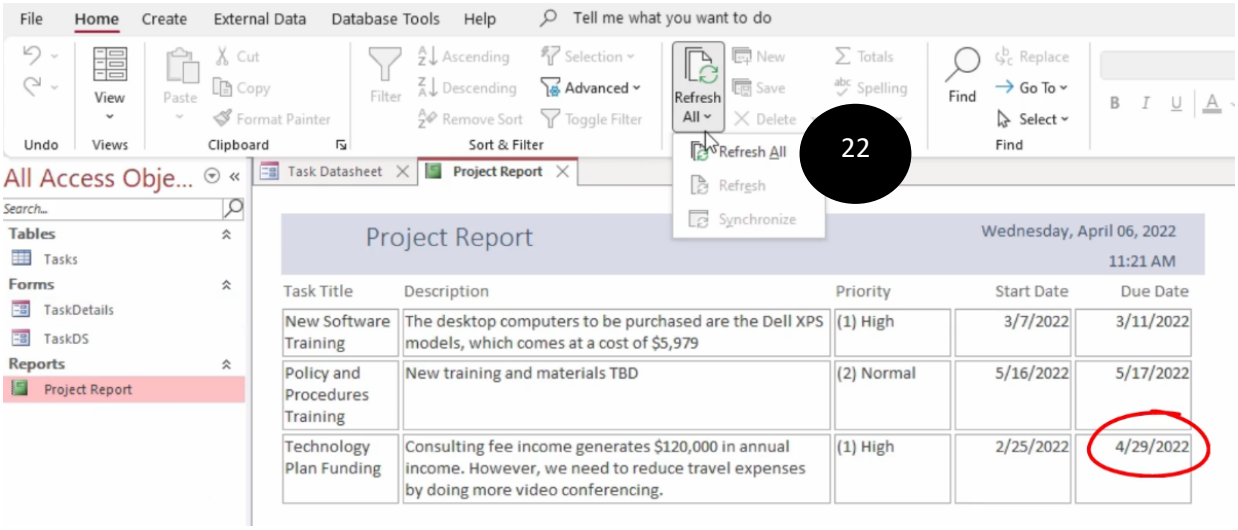
20. Then click on the Format tab. Under Alternate back color, choose “No Color”. Close the Property Sheet.



21. Then click on the View Tab to go back to Datasheet View. Then right-click on the Report tab and click Save. Let’s name it “Project Report”. Close the report.

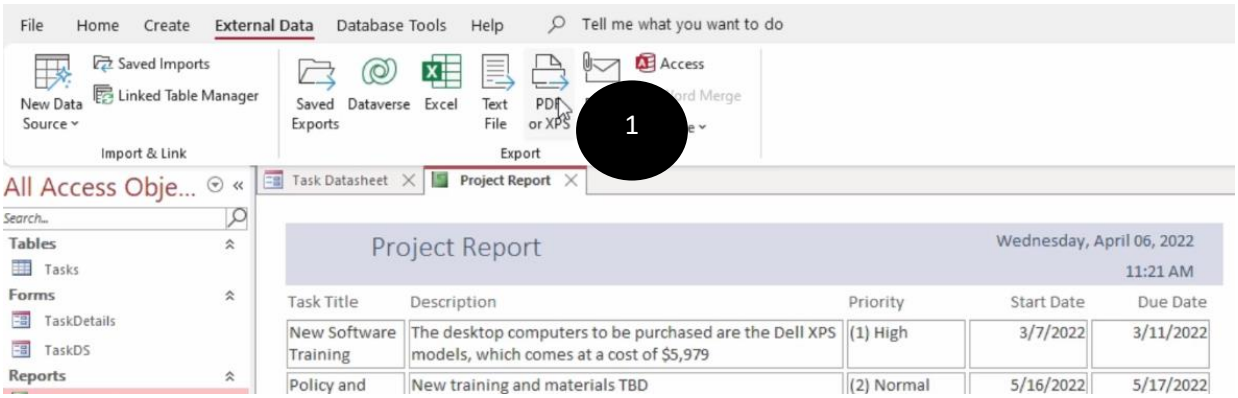


22. As you input new entries and make changes using the Project form, the report will also reflect those changes after you open it and click on “Refresh All”. For example, we can change one of the due dates on the Form and then save it. When we go back to open the Report, we can click on Refresh All, and see that due date change made on the report:

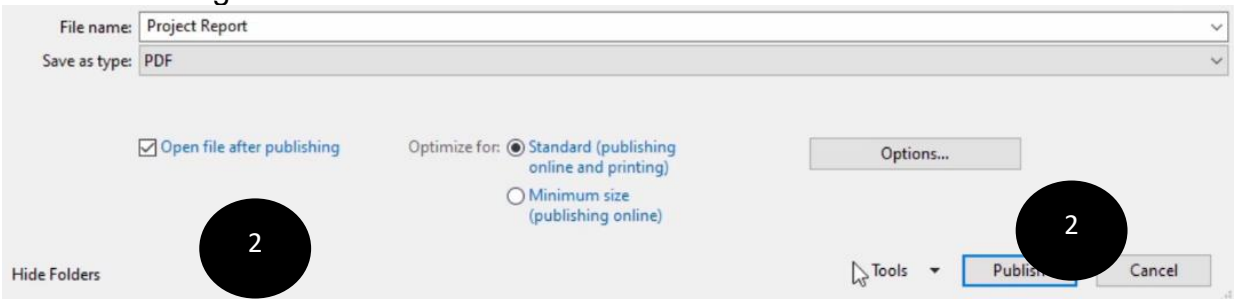


Exporting a Report

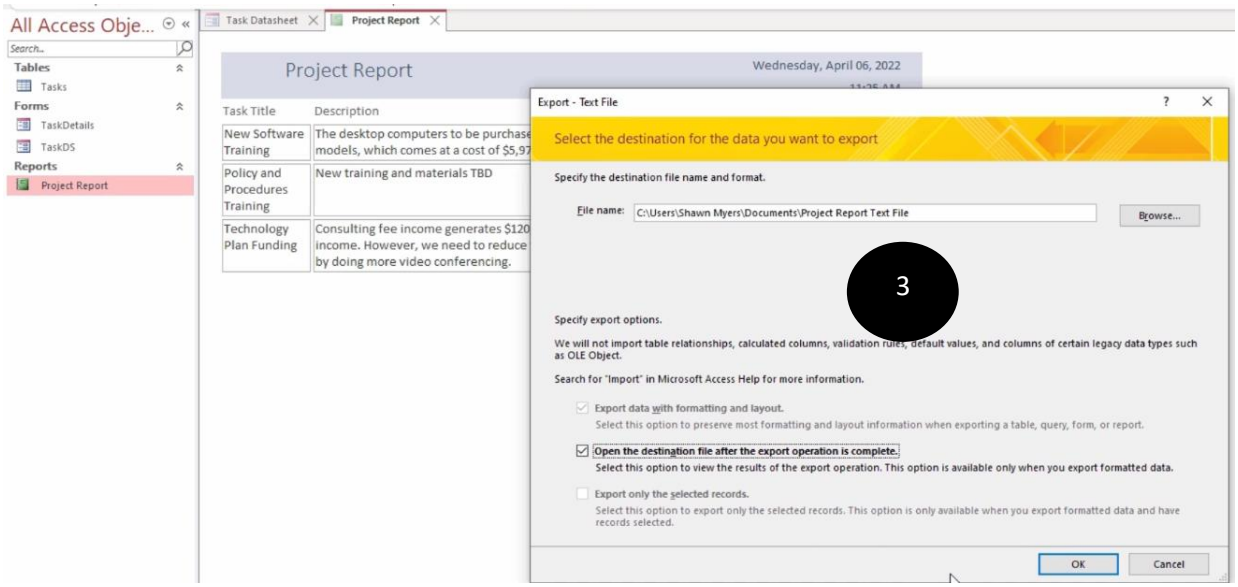
1. To export the report as a PDF file, click on the external data tab. Click on PDF or XPS from the Export group.



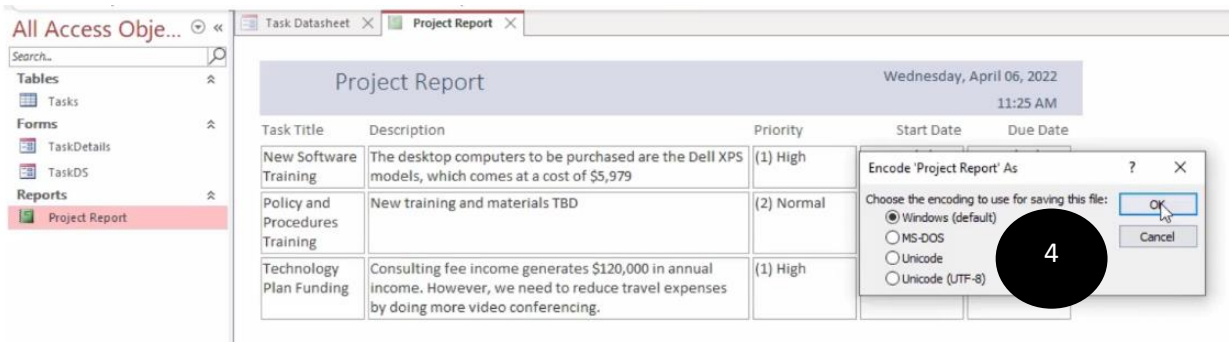
2. Choose a file location in this case. For this example, let's choose "Open File After Publishing". Let's choose "Standard" and then click "Publish".



3. To export the report as a text file, you would click on "Text File" under Export. Change the file name, keep the same file location and checkoff where it says, "Open the destination file after the exports been completed". Click Ok.



4. Keep the default setting under "Encode 'Project Report' As"; click OK.

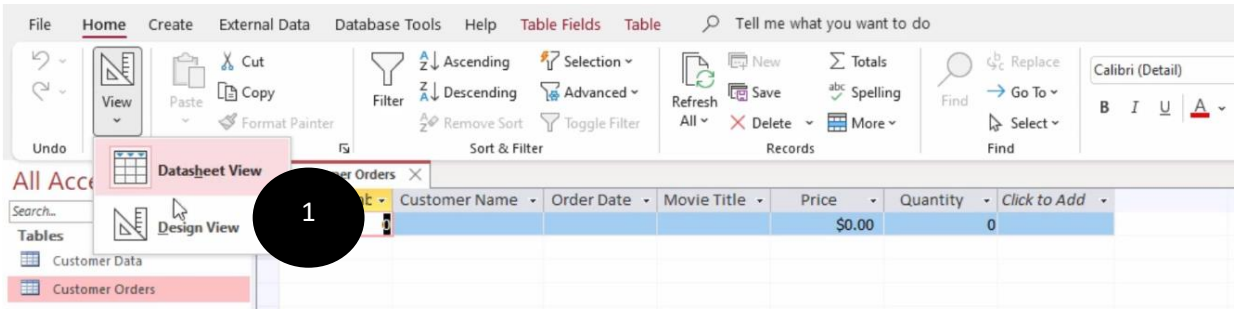


The Report will open in the Windows Notepad application.

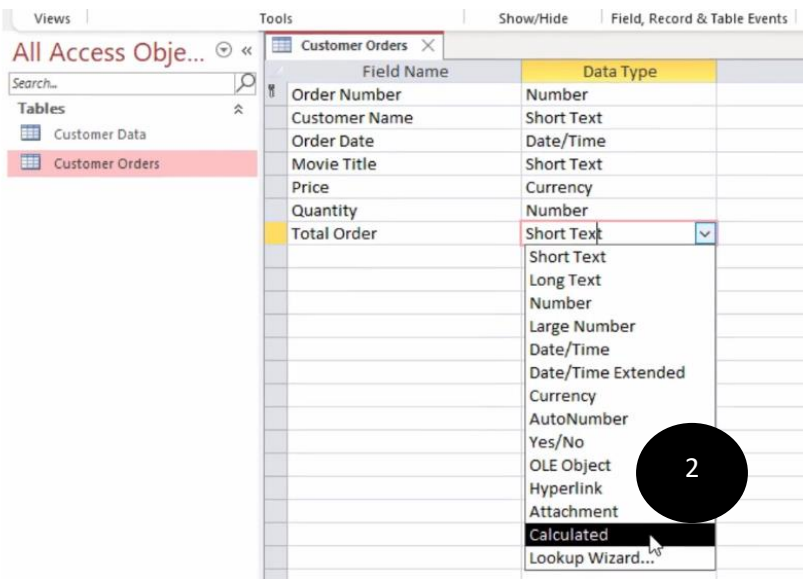
Access Project: Create a Database with Table Relationships

In this lesson we are going to create an access database that includes something called “Relationships”. A Relationship means that records in one Table can be used to automatically populate the records in other Tables.

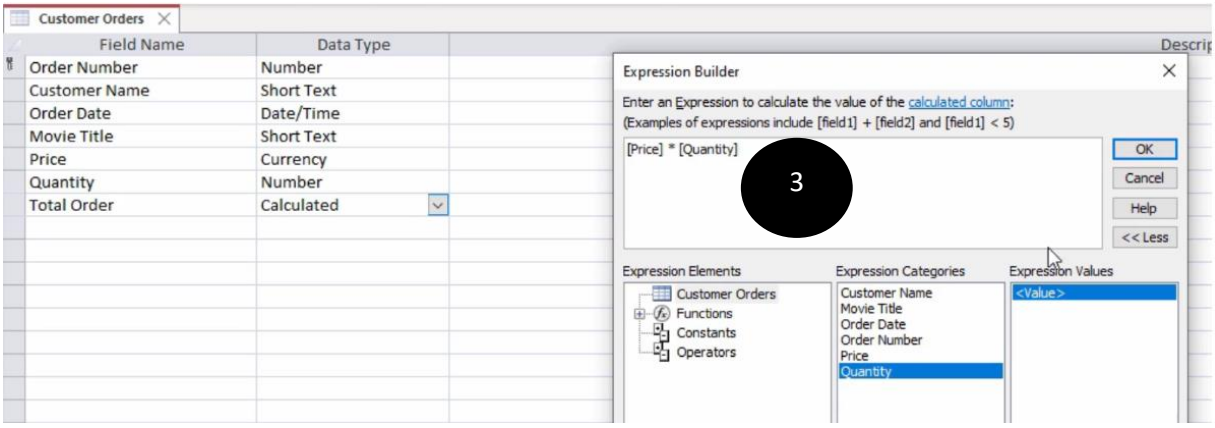
1. Click on the Customer Order Table and go to Design View.



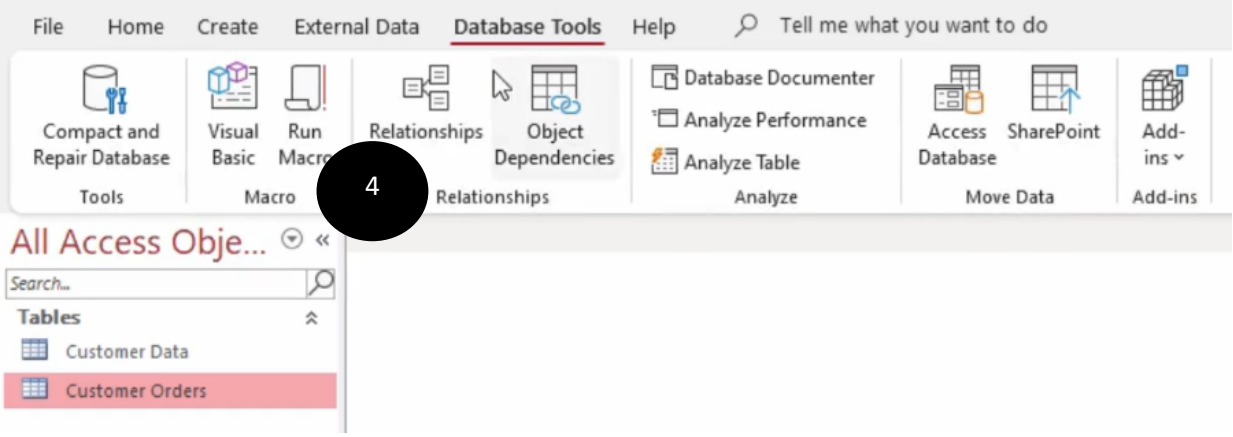
2. Let's add another Field that will multiply the price times the quantity ordered. Type the words "Total Order", then go to the Data Type drop down and choose the "Calculated" Data Type.



3. This will open what's called Expression Builder, which is used to input formulas that perform calculations. Double-click on price input an asterisk and then double-click on Quantity; click OK. Save the Table and then close it.

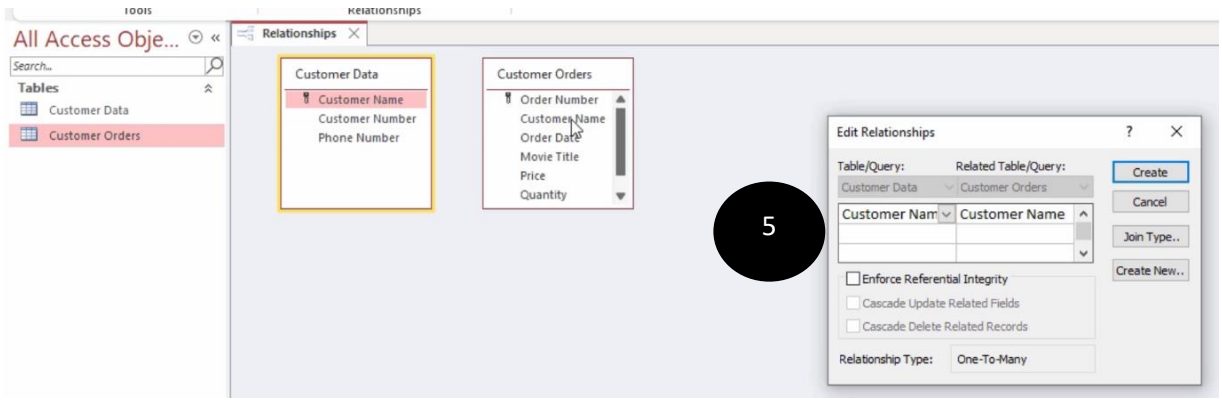


Let’s click on the Database Tools tab and choose Relationships

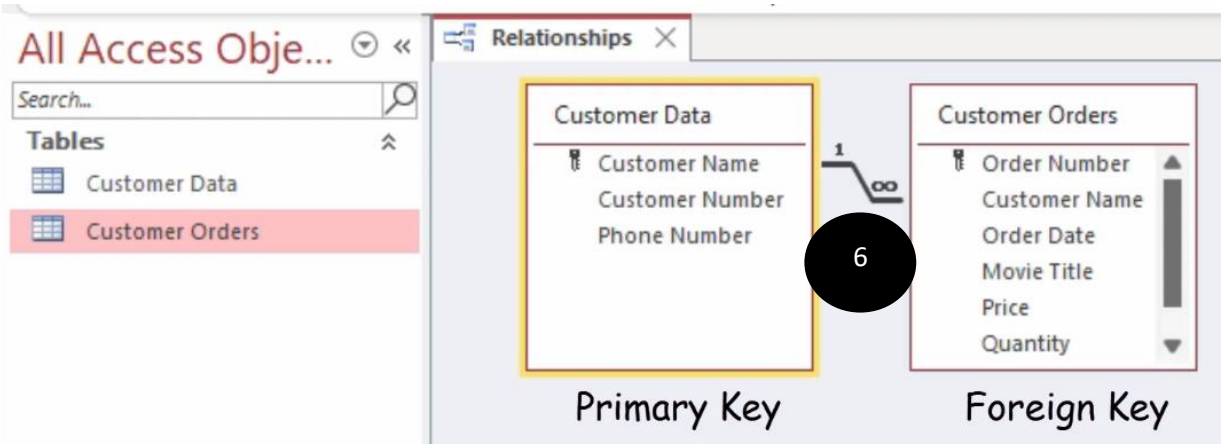


4. Click on Customer Name in the Customer data table. Then use the mouse to create what’s called a Join Line between the two customer name fields. The Edit Relationship dialog box will appear. Check off where it says, “Enforce Referential Integrity”, which means that you’re protecting the relationship between the two fields.

5. By enforcing referential integrity, you are saying that the record in one Table will always have an associated record in another Table. Click on Create.

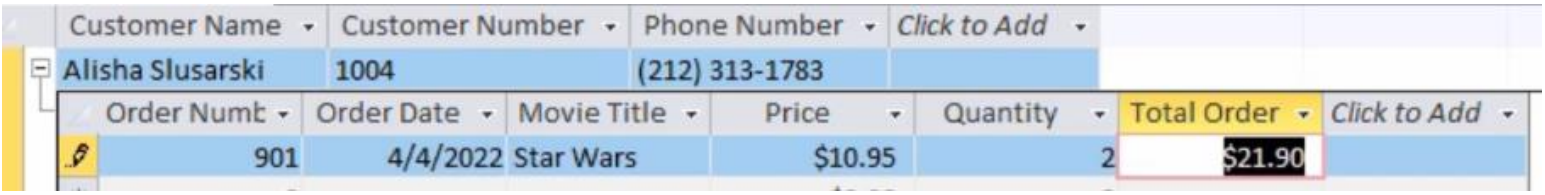


6. You will see that a Join Line appears, which indicates a one-to-many relationship. In other words, the customer information Table can only have one unique customer name in the Table; this is called the **Primary Key.** The Order Table, however, can have many customer names; and the same customer name can appear multiple times. This is referred to as the **Foreign Key.**



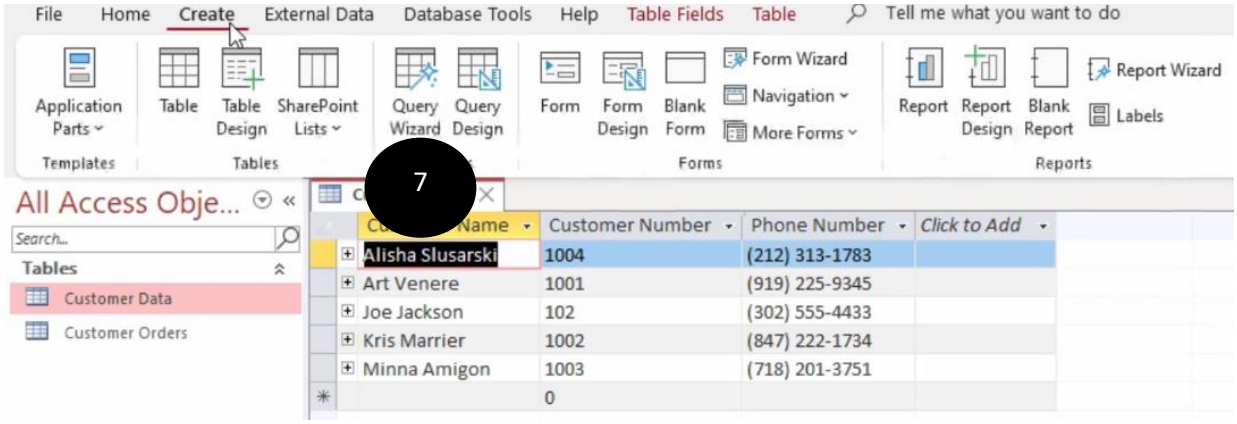
7. Click on the Close button, then double-click on the Customer data table. You will see that there is a plus sign next to each name. And when you click on it, the information from the Order table will appear.

6. To see how this works, input the following data under the name “Alisha Slusarski”. When finished, click on the minus sign, and then save the Table.

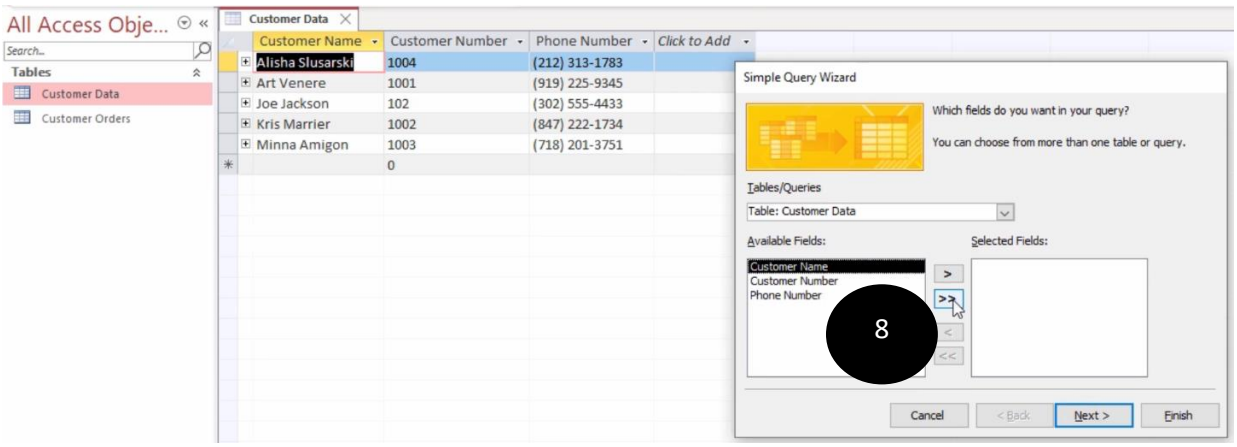


Create a Query

7. A Query is an Object that can display a summary of information from one or more tables. Click on the Customer Data Table, then click on the Create tab; click on the Query Wizard.

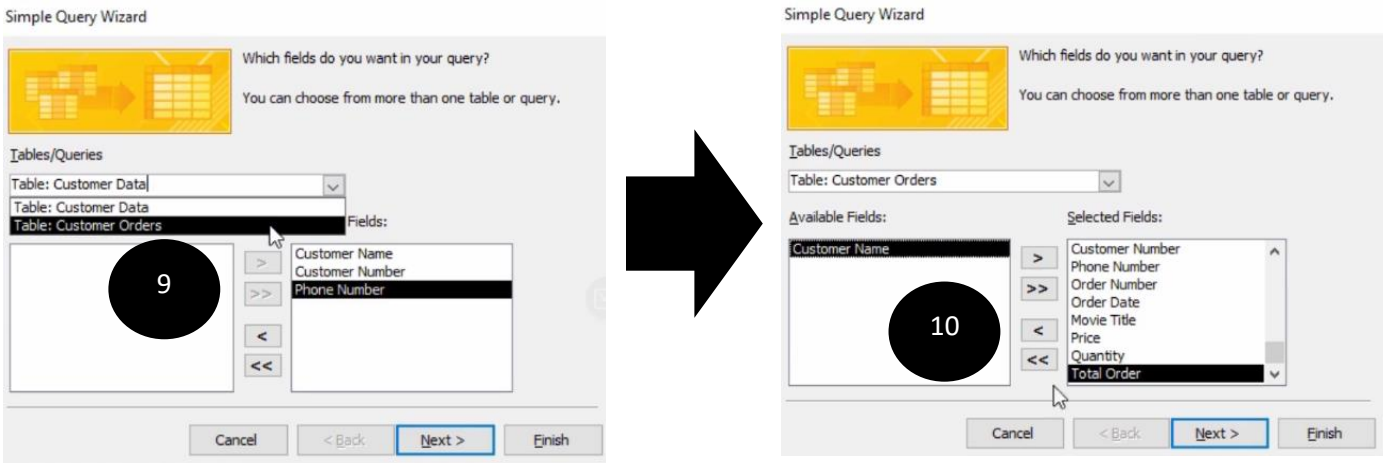


8. The New Query dialog box will appear. Choose Simple Query and then click OK. Under Available Fields, choose all the fields from the Custom Information table by clicking on the two right arrows.

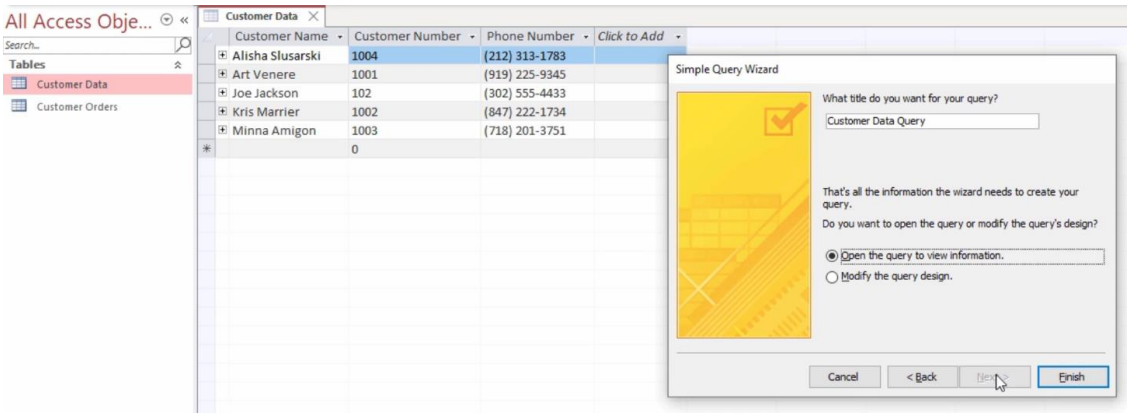


9. Click on the Tables Queries down arrow. Choose the Customer Orders table.

10. Choose all the fields except for the Customer Name field by either clicking on the right arrow to select each field or we can double-click on each name. When finished, click the Next button twice.

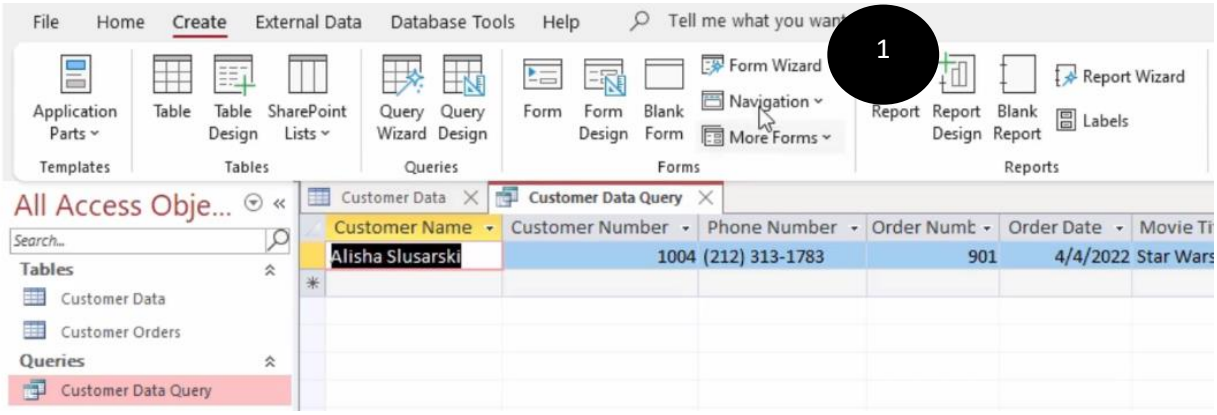


11. Keep the default name, which is “Customer Data Query” and click Finish.

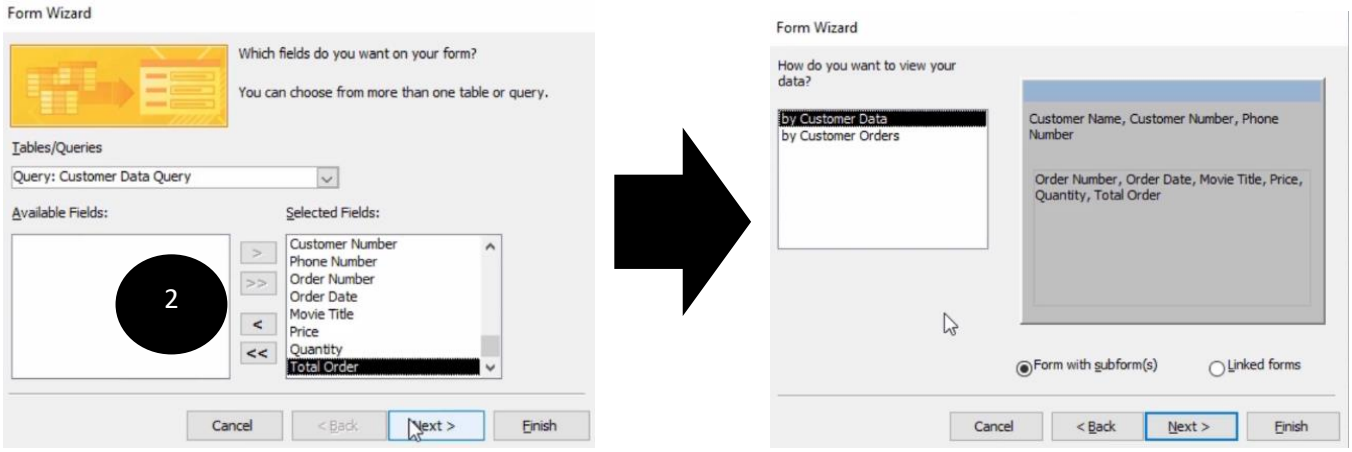


Create an Order Form

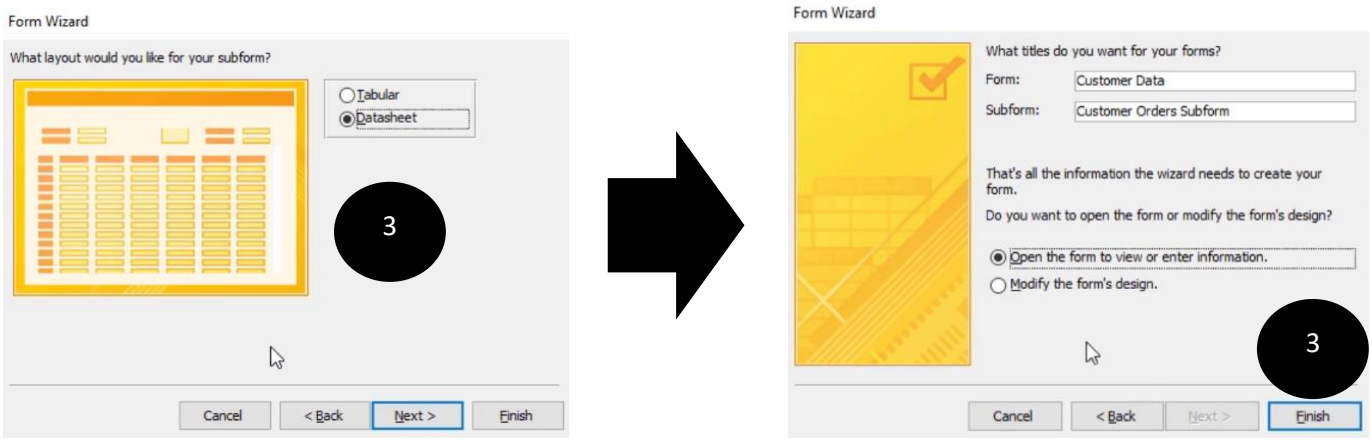
1. Click on the Customer Data Query, then click on the Create tab; click on Form Wizard.



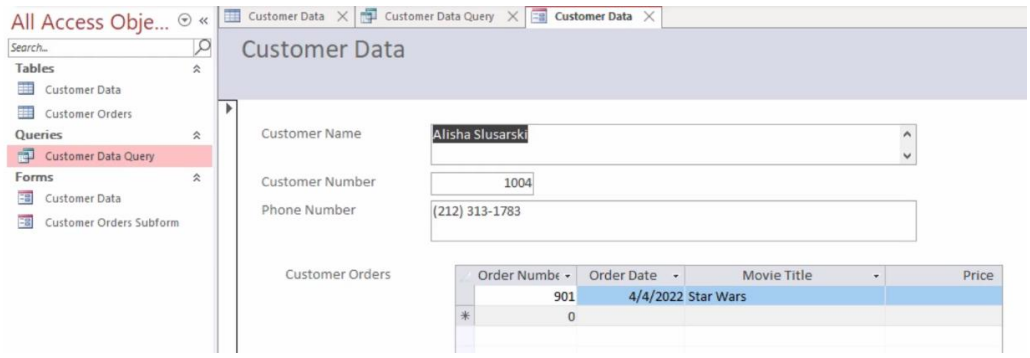
2. Click on the two arrows to select all the fields and then click Next. Let's keep the option to create a subform. This means that one form will be used to input the customer data and the other form, which is a subform, will be used enter the order. Click next.



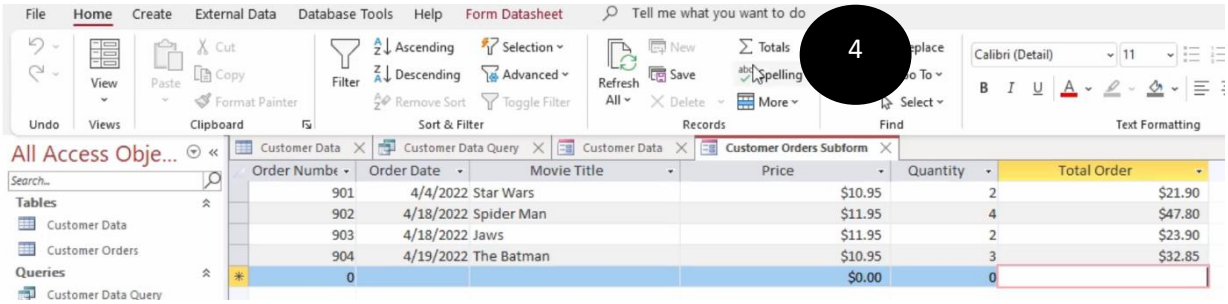
3. Use Datasheet as the subform layout; click Next. Let's keep the default names and click Finish.



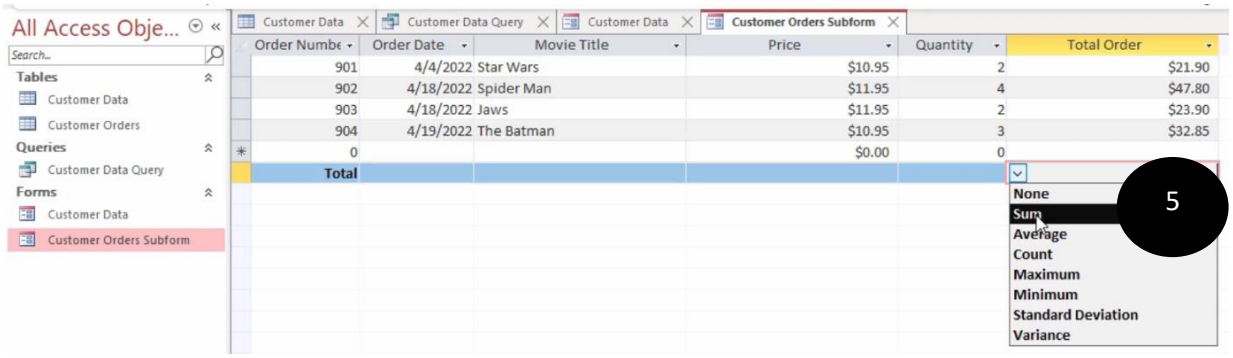
The Form will now show the two areas where data can be inputted.



4. Click on the Total Orders Subform, then click on the last row. Click on the Home tab, then click on the Totals button for the Records group.



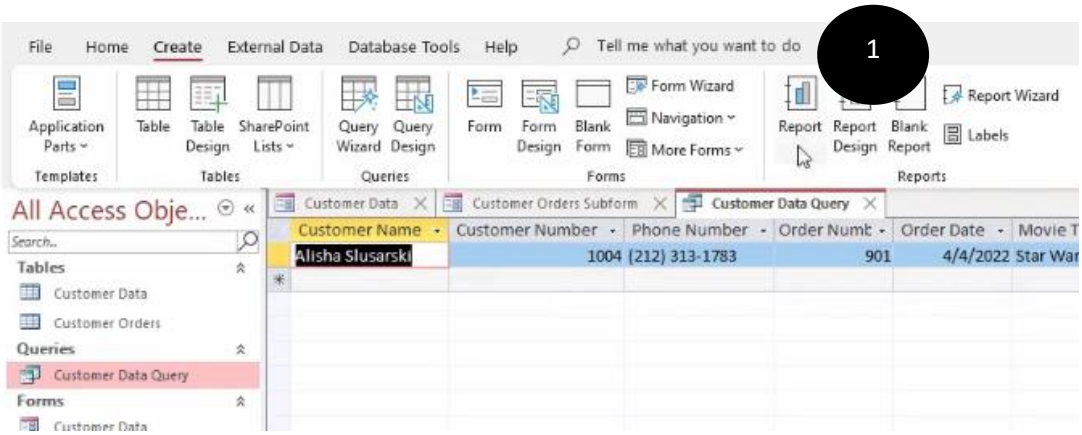
5. Click on a space under Total Order and choose Sum.



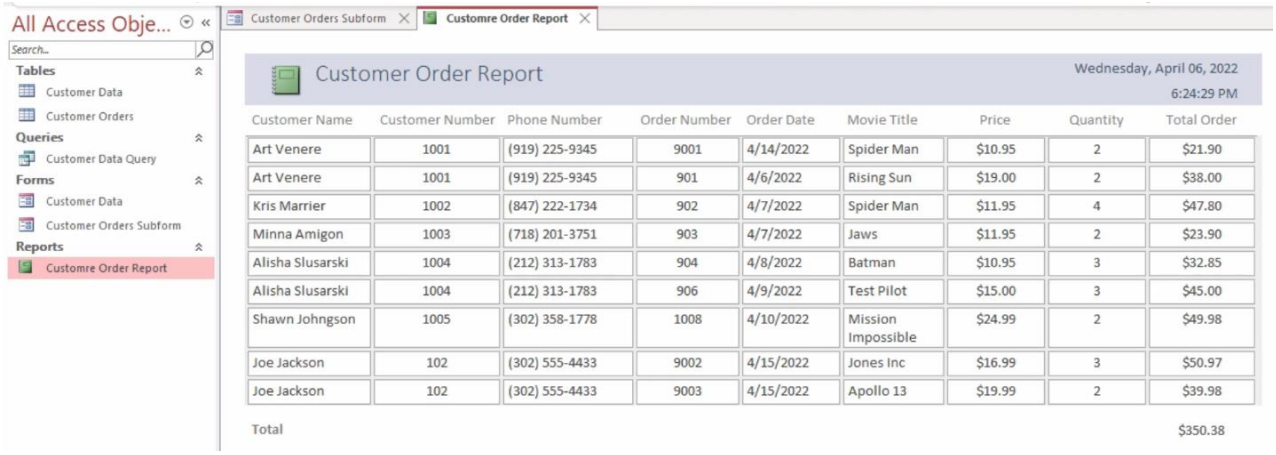
And now the total will be calculated each time a new order is entered. You can repeat these steps to create a total row for the Customer Information Form.

Create an Order Entry Report

1. Click on the Customer Data Query. Click on Create, then click on Report in the Reports group.

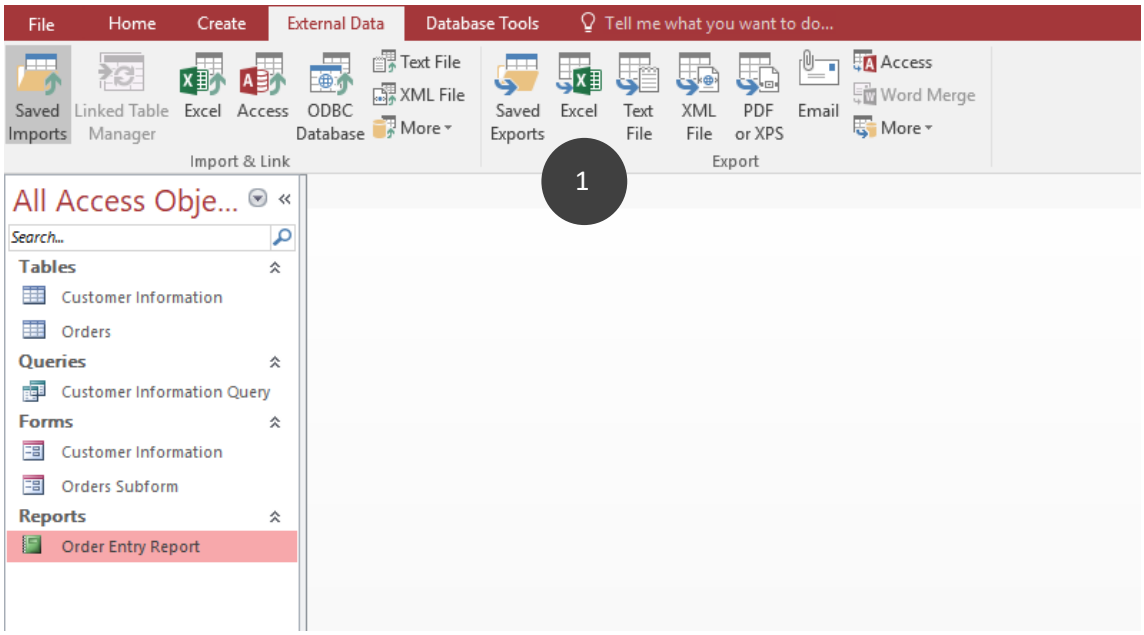


2. After the Report appears, you can switch to the Layout view to adjust the formatting.

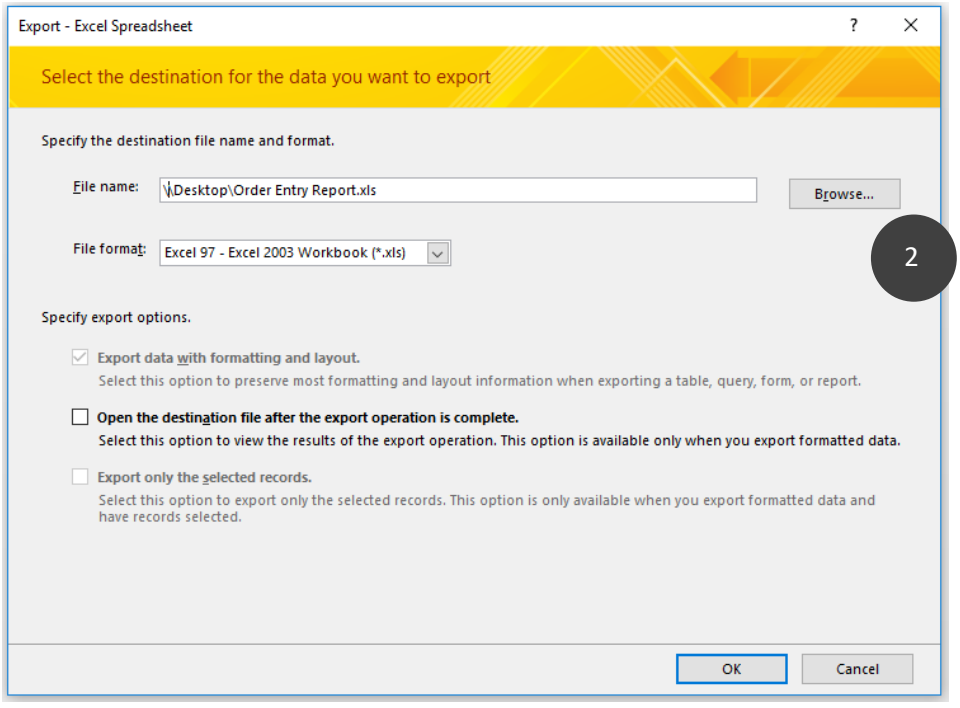


Exporting Reports from Access to Excel

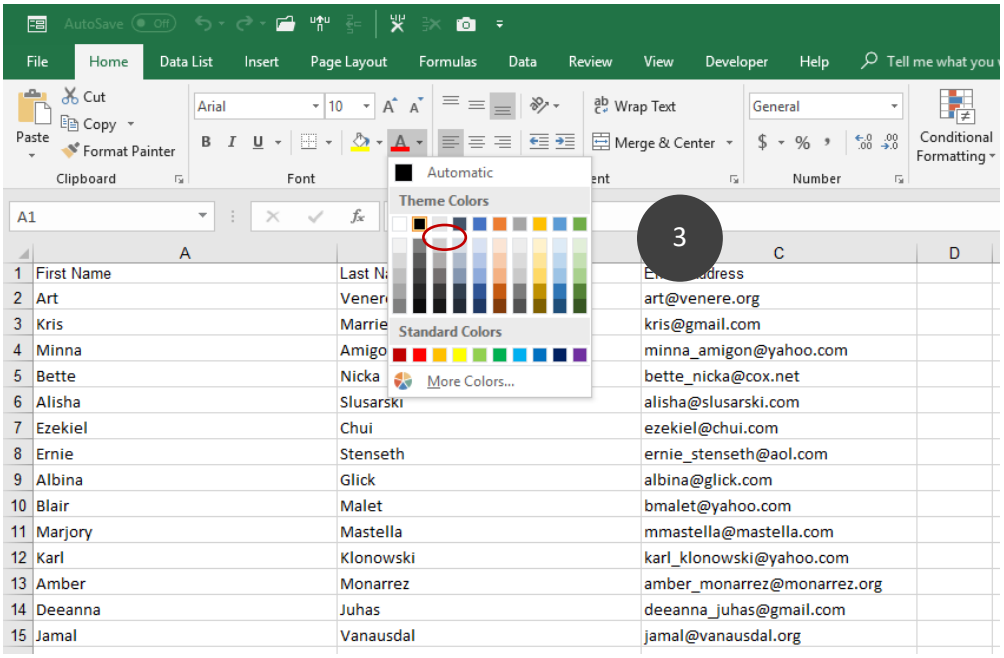
1. Right-click on the Report tab again and choose Close All. Click on the Order Entry report, then click on the External Data tab; Click on Excel under Export.



2. Use the default file location or click on Browse to choose where you want the file to be exported to. Click OK.

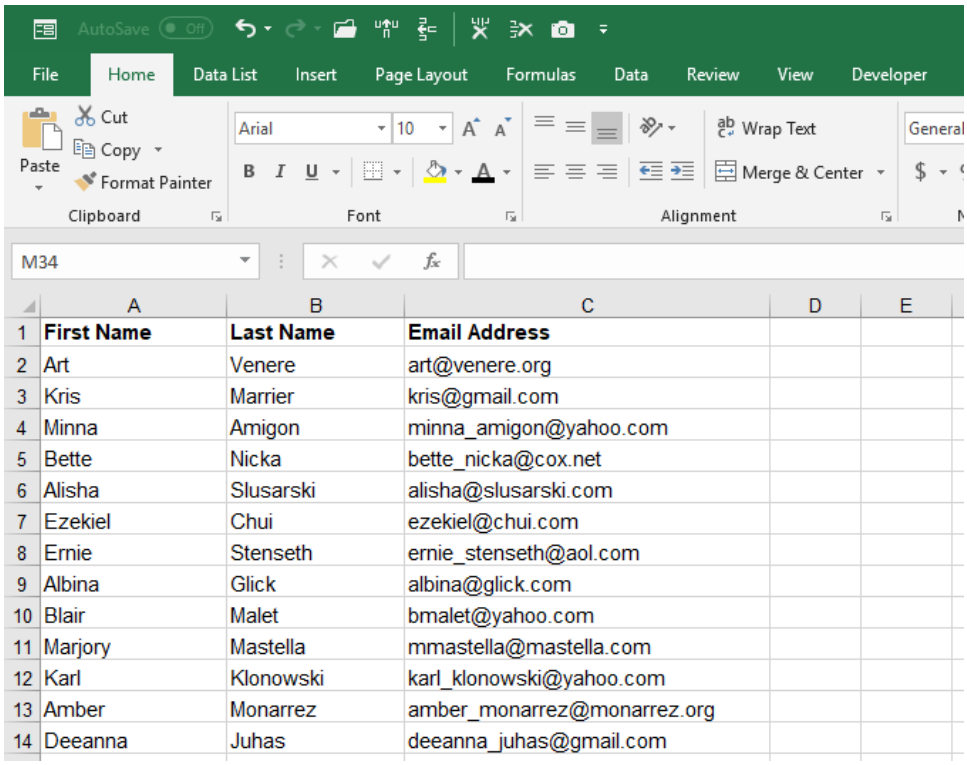


3. After the file is open, you may need to adjust the Font colors, column widths and styles. To do this, select all the columns, then go to the font color drop-down, let's choose Black Text 1.



	A	B	C	D
1	First Name	Last Na	Email Address	
2	Art	Venere	art@venere.org	
3	Kris	Marrie	kris@gmail.com	
4	Minna	Amigo	minna_amigon@yahoo.com	
5	Bette	Nicka	bette_nicka@cox.net	
6	Alisha	Slusarski	alisha@slusarski.com	
7	Ezekiel	Chui	ezekiel@chui.com	
8	Ernie	Stenseth	ernie_stenseth@aol.com	
9	Albina	Glick	albina@glick.com	
10	Blair	Malet	bmalet@yahoo.com	
11	Marjory	Mastella	mmastella@mastella.com	
12	Karl	Klonowski	karl_klonowski@yahoo.com	
13	Amber	Monarrez	amber_monarrez@monarrez.org	
14	Deeanna	Juhas	deeanna_juhas@gmail.com	
15	Jamal	Vanausdal	jamal@vanausdal.org	

4. Adjust the column widths and font sizes.



	A	B	C	D	E
1	**First Name**	**Last Name**	**Email Address**		
2	Art	Venere	art@venere.org		
3	Kris	Marrier	kris@gmail.com		
4	Minna	Amigon	minna_amigon@yahoo.com		
5	Bette	Nicka	bette_nicka@cox.net		
6	Alisha	Slusarski	alisha@slusarski.com		
7	Ezekiel	Chui	ezekiel@chui.com		
8	Ernie	Stenseth	ernie_stenseth@aol.com		
9	Albina	Glick	albina@glick.com		
10	Blair	Malet	bmalet@yahoo.com		
11	Marjory	Mastella	mmastella@mastella.com		
12	Karl	Klonowski	karl_klonowski@yahoo.com		
13	Amber	Monarrez	amber_monarrez@monarrez.org		
14	Deeanna	Juhas	deeanna_juhas@gmail.com		