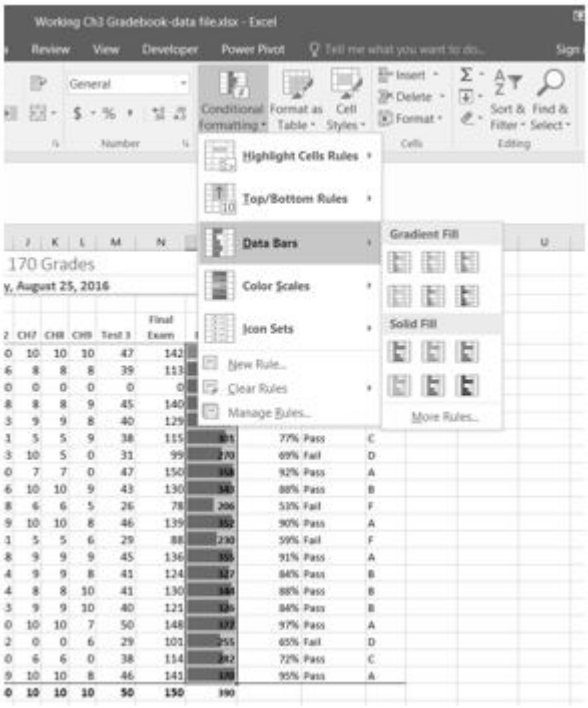


Figure 3.19 Data Bars on the Conditional Formatting tool

It is even more important to highlight the students who are failing in the class. To practice further with Conditional Formatting we will do that in two places, in the Percentages column and on the Letter Grade column. To start with, we want any **F** letter grades to be formatted with a light red fill color and dark red text.

1. Select the Letter Grades (**R5:R24**).
2. On the Home tab, in the Styles group, select **Highlight Cell Rules** from the Conditional Formatting tool (see **Figure 3.20**).
3. Select **Equal To**
4. Fill out the Equal to dialog box so that cells that are equal to: **F** have **Light Red Fill with Dark Red Text** (see **Figure 3.21**).

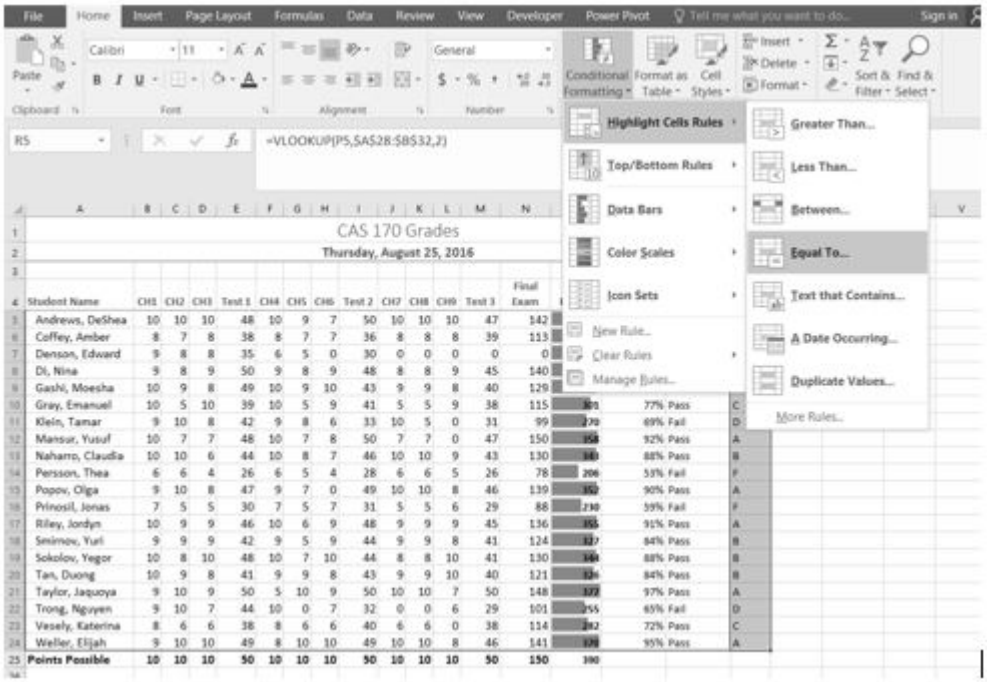


Figure 3.20 Conditional Formatting Equal To

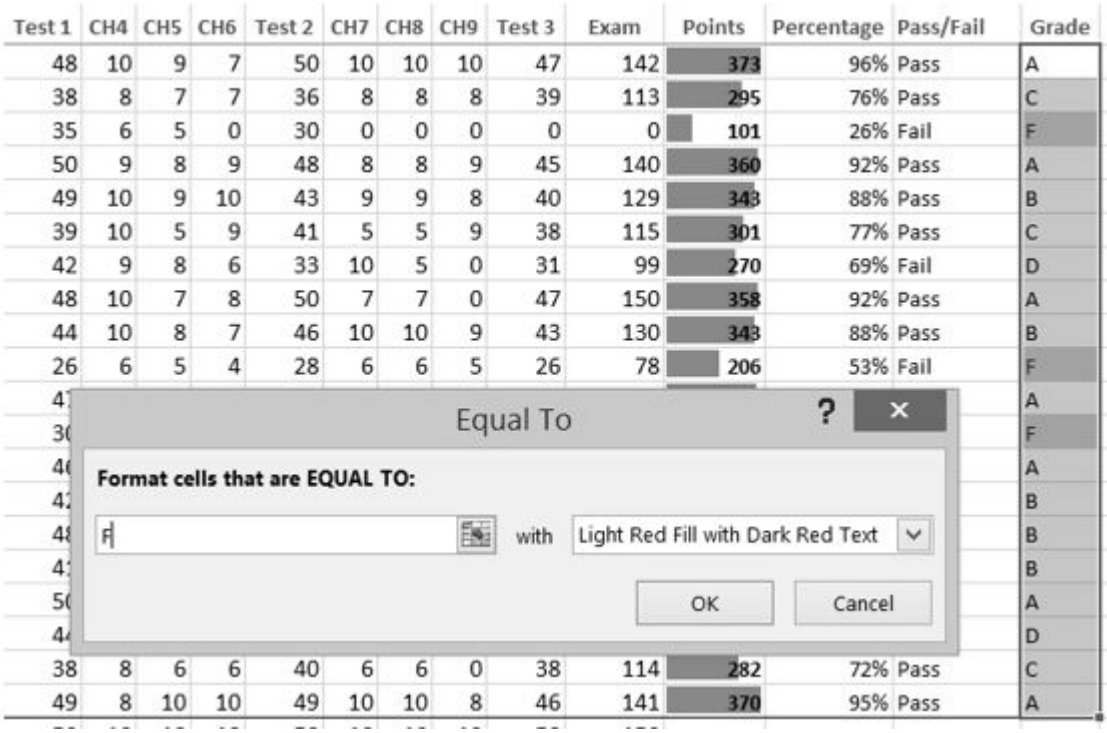


Figure 3.21 Conditional Formatting Equal To Dialog Box

Let's try that one more time – to highlight those students who are passing the class. This time we will use the Pass/Fail text in the Pass/Fail column. If the text for a student is Pass we want the cell to be formatted with a yellow fill with dark yellow text.

1. Select the Pass/Fail grades (**Q5:Q24**).

2. On the Home tab, in the Styles group, select **Highlight Cell Rules** from the Conditional Formatting tool (see **Figure 3.20**).
3. Select **Equal To**
4. Fill out the Equal to dialog box so that cells that are equal to: **Pass** have **Yellow Fill with Dark Yellow Text**. (To find the Yellow Fill with Dark Yellow text option, click the the down arrow at the end of the last (with) box).

You do not have to use the default styles to make your data stand out. You can set any formatting you want. When you do, it is probably a good idea to include other styling in addition to color. Your spreadsheet might be printed in black and white. You would hate to lose your Conditional formatting. Now we are going to use conditional formatting to display any Percentages that are less than 60% with red text formatted in bold and italic.

1. Select the Percentage grades (**P5:P24**).
2. On the Home tab, in the Styles group, select Highlight Cell Rules from the Conditional Formatting tool (see **Figure 3.20**).
3. Select **Less Than**
4. Fill out the Less Than dialog box so that cells that are less than **.6** will be have conditional formatting. But, instead of using the default red text on a light red fill, press the down arrow at the end of that box and select **Custom Format**.
5. On the **Font** tab of the Format Cells dialog box, in the Font style box, select **Bold Italic**. In the Color box, select **Red** (see **Figure 3.22**).
6. Press OK. Then press OK again.

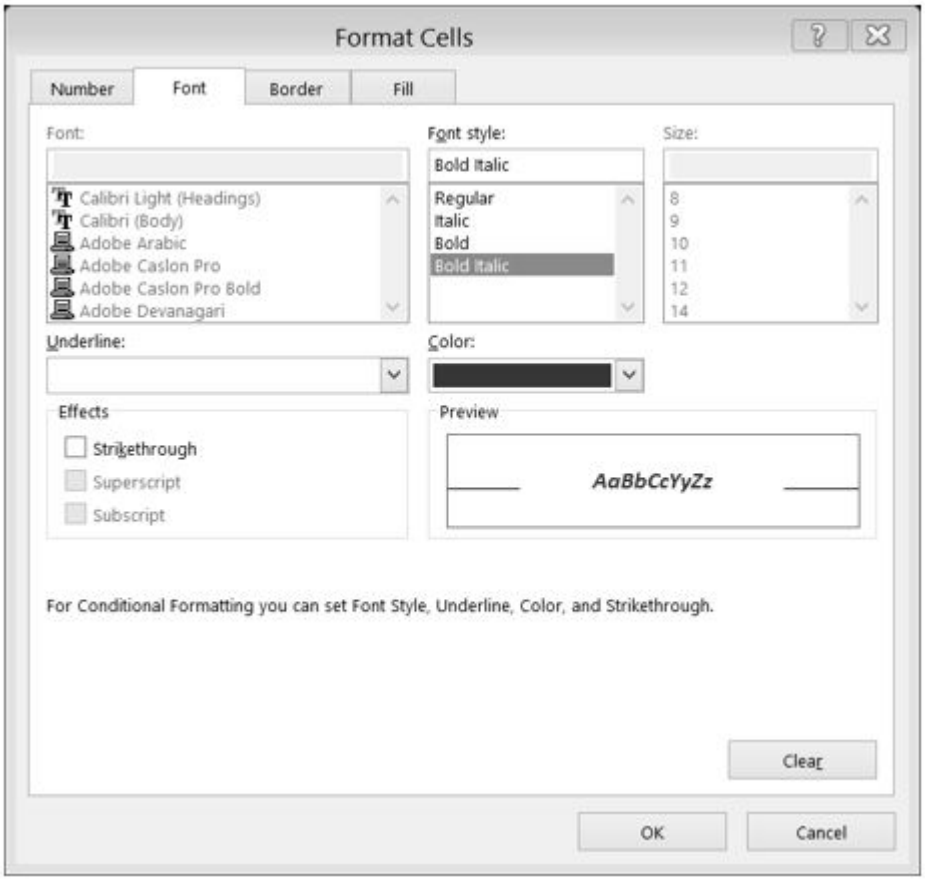


Figure 3.22 Conditional Formatting Custom Format Cells Dialog box

Conditional Formatting is valuable in that it reflects the current data. It changes to reflect changes in the data. To test this, delete DeShea's final exam score. (Select N5. Press Delete on your keyboard.) Suddenly, DeShae is failing the course and the Conditional Formatting reflects that. This is a little unfair to DeShae – who has worked so hard this quarter. Let's give him back his grade. Press CTRL Z (Undo). His test score reappears and the Conditional formatting reflects that as well.

MAKING CHANGES

What if you have made a mistake with your Conditional Formatting? Or, you want to delete it altogether? You can use the **Conditional Formatting Manage Rules** tool. In our example, we want to remove the conditional formatting rule that formats the **Pass** text with yellow. We are also going to modify the minimum passing percentage for the conditional formatting rule that is applied to the percentages.

1. On the Home Tab, in the Styles Group, select **Manage Rules** at the very bottom of the Conditional Formatting drop-down list.
2. Show formatting rules for: **This Worksheet** (see **Figure 3.23**).
3. We don't really need to highlight the students who are passing the class, so select that

rule in the Rules Manager and press the **Delete Rule** button. Mac Users should click the minus symbol – at bottom left corner to delete the rule.

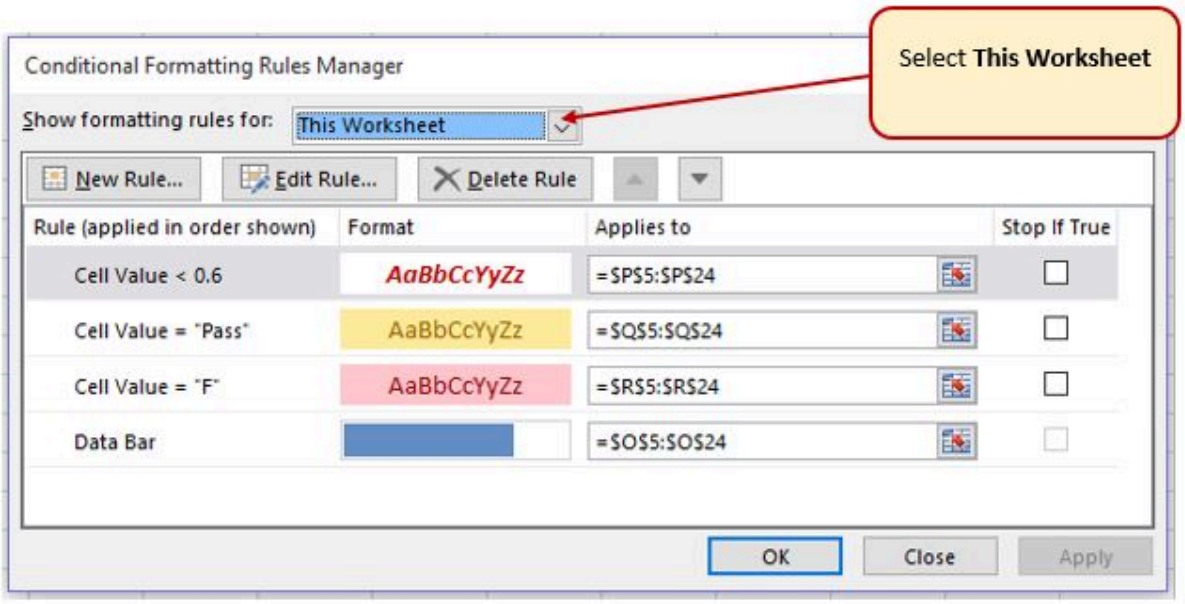


Figure 3.23 Conditional Formatting Manage Rules

In a previous exercise (the IF function), we decided that students were failing if they got a percentage score of less than 70%, so the Conditional Formatting rule in the Percentage column needs repair.

4. Select the rule that reads Cell Value <0.6.
5. Select the Edit Rule button, and change the .6 to .7 (see **Figure 3.24**).
6. Click OK (or Apply) twice. Double check that your completed workbook matches **Figure 3.25**.

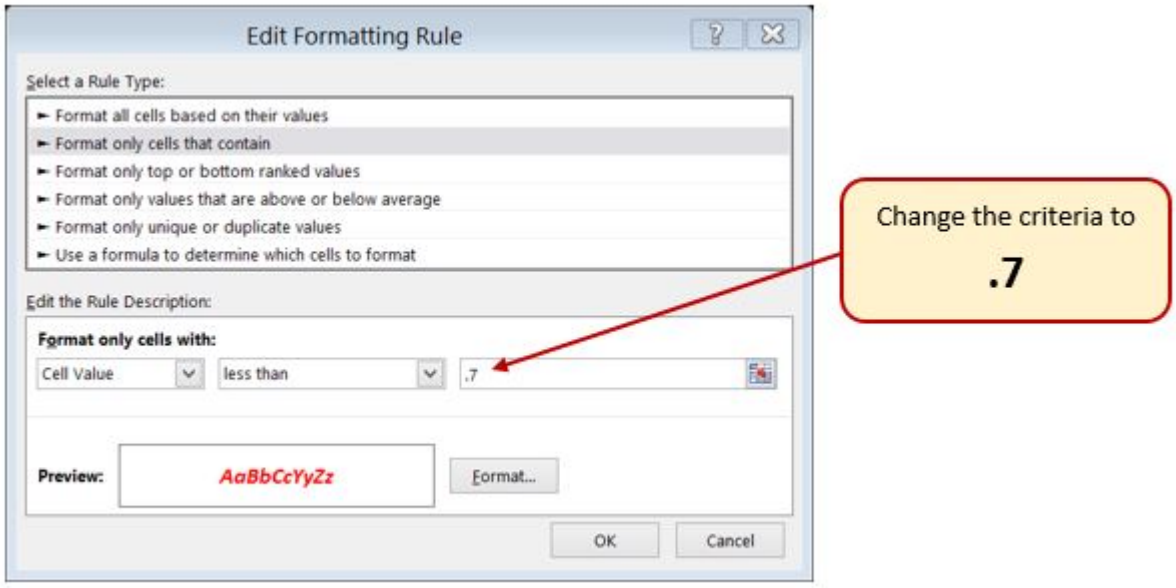


Figure 3.24 Conditional Formatting Edit Formatting Rule Dialog box

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	CAS 170 Grades																		
2	Wednesday, September 28, 2016																		
3																			
4	**Student Name**	**CH1**	**CH2**	**CH3**	**Test 1**	**CH4**	**CH5**	**CH6**	**Test 2**	**CH7**	**CH8**	**CH9**	**Test 3**	**Final Exam**	**Total Points**	**Percentage**	**Pass/Fail**	**Letter Grade**	
5	Andrews, DeShea	10	10	10	48	10	9	7	50	10	10	10	47	142	373	96%	Pass	A	
6	Coffey, Amber	8	7	8	38	8	7	7	36	8	8	8	39	113	295	76%	Pass	C	
7	Denson, Edward	9	8	8	35	6	5	0	30	0	0	0	0	0	101	*26%*	Fail	F	
8	Di, Nina	9	8	9	50	9	8	9	48	8	8	9	45	140	360	92%	Pass	A	
9	Gashi, Moesha	10	9	8	49	10	9	10	43	9	9	8	40	129	343	88%	Pass	B	
10	Gray, Emanuel	10	5	10	39	10	5	9	41	5	5	9	38	115	301	77%	Pass	C	
11	Klein, Tamar	9	10	8	42	9	8	6	33	10	5	0	31	99	270	*69%*	Fail	D	
12	Mansur, Yusuf	10	7	7	48	10	7	8	50	7	7	0	47	150	358	92%	Pass	A	
13	Naharro, Claudia	10	10	6	44	10	8	7	46	10	10	9	43	130	343	88%	Pass	B	
14	Persson, Thea	6	6	4	26	6	5	4	28	6	6	5	26	78	206	*53%*	Fail	F	
15	Popov, Olga	9	10	8	47	9	7	0	49	10	10	8	46	139	352	90%	Pass	A	
16	Prinosil, Jonas	7	5	5	30	7	5	7	31	5	5	6	29	88	230	*59%*	Fail	F	
17	Riley, Jordyn	10	9	9	46	10	6	9	48	9	9	9	45	136	355	91%	Pass	A	
18	Smirnov, Yuri	9	9	9	42	9	5	9	44	9	9	8	41	124	327	84%	Pass	B	
19	Sokolov, Yegor	10	8	10	48	10	7	10	44	8	8	10	41	130	344	88%	Pass	B	
20	Tan, Duong	10	9	8	41	9	9	8	43	9	9	10	40	121	326	84%	Pass	B	
21	Taylor, Jaquoya	9	10	9	50	5	10	9	50	10	10	7	50	148	377	97%	Pass	A	
22	Trong, Nguyen	9	10	7	44	10	0	7	32	0	0	6	29	101	255	*65%*	Fail	D	
23	Vesely, Katerina	8	6	6	38	8	6	6	40	6	6	0	38	114	282	72%	Pass	C	
24	Weller, Elijah	9	10	10	49	8	10	10	49	10	10	8	46	141	370	95%	Pass	A	
25	**Points Possible**	**10**	**10**	**10**	**50**	**10**	**10**	**10**	**50**	**10**	**10**	**10**	**50**	**150**	390				
26																			
27	Letter Grades																		
28	0%	F																	
29	60%	D																	
30	70%	C																	
31	80%	B																	
32	90%	A																	
33																			
34																			

Grades

Figure 3.25 Completed Ch3 Gradebook

SETTING THE PRINT AREA

Before you consider this workbook finished, you need to prepare it for printing. The first thing you will do is set the Print Area so that the table of Letter Grades in A27:B32 does not print.

1. Select A1:R25. This is the only part of the worksheet that you want to have print.
2. On the **Page Layout** ribbon, click the **Print Area** button. Choose **Set Print Area** from the menu.

Next you will preview the worksheet in Print Preview to check that the print area setting worked, as well as make sure it is printing on one page.

1. View the workbook in Print Preview.

   Mac Users should choose **Print** from the **File** menu to view Print Preview.
2. Set the page orientation to **Landscape**.
3. Change the page scaling if needed so that the entire worksheet prints on one page.
4. Save the **CH3 Gradebook and Parks** workbook.

ATTRIBUTION

3.4 Preparing to Print

Learning Objectives

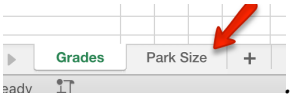
- Locate and fix formatting consistency errors.
- Apply new formatting techniques.
- Use Print Titles to repeat rows and columns on each page of a multiple page worksheet.
- Control where page breaks occur in a multiple page worksheet.

In this section, we will review a worksheet for formatting consistency, as well as learn two new formatting techniques. This worksheet currently prints on four pages, so we will learn new page setup options to control how these pages print. A new data file will be used for this section.

REVIEWING FORMATTING FOR CONSISTENCY

Open the **"CH3-Gradebook and Parks"** workbook if it isn't already open.

Click on the "Park Size" sheet tab within your "CH3-Gradebook and Parks" workbook



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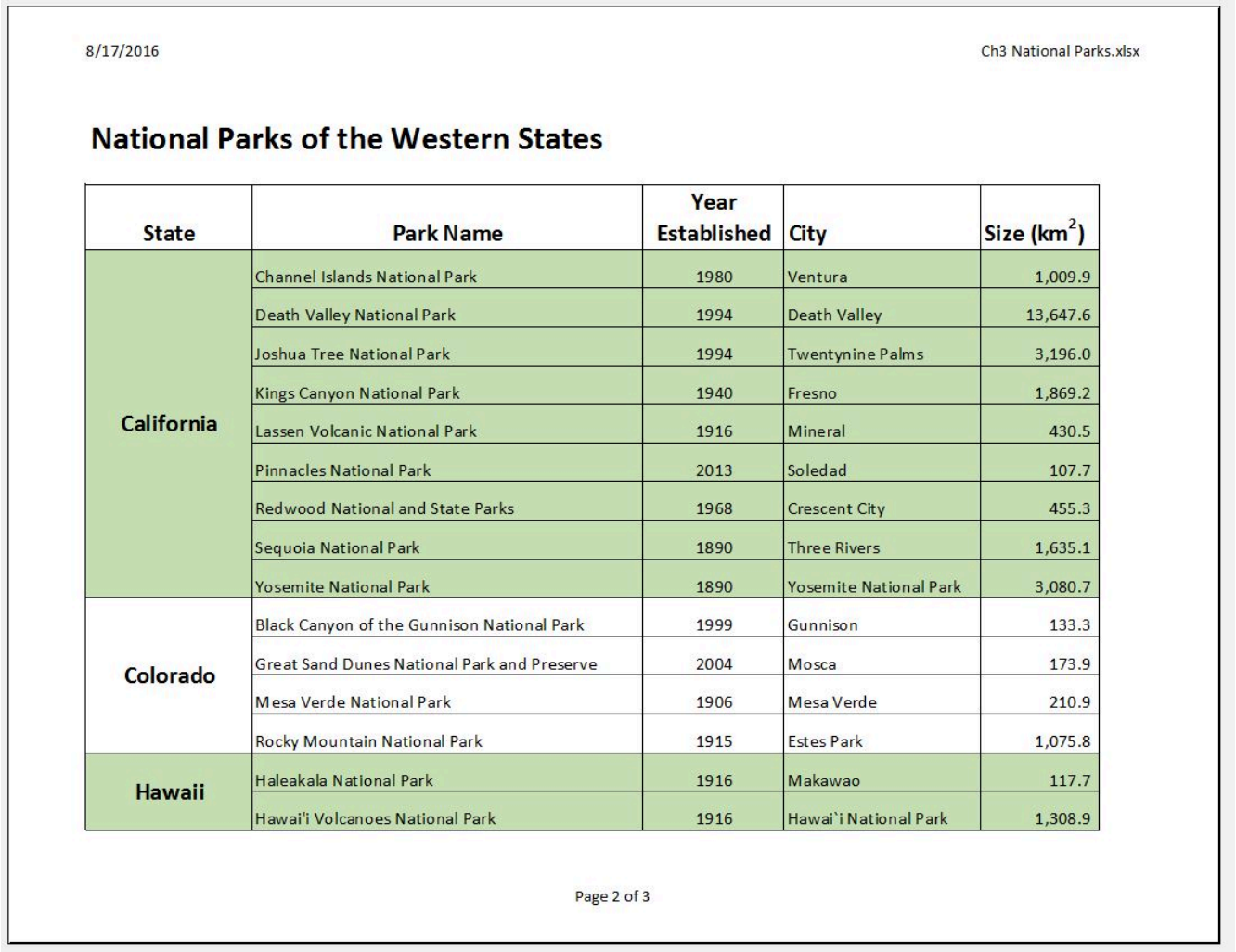
You have been given a spreadsheet with data about the national parks in the western United States. Your coworker formatted the workbook and has asked you to review it for consistency. You also need to prepare it for printing. **Figure 3.26** shows how the second page of the finished worksheet will appear in Print Preview.



8/17/2016 Ch3 National Parks.xlsx

National Parks of the Western States

State	Park Name	Year Established	City	Size (km^2)
California	Channel Islands National Park	1980	Ventura	1,009.9
	Death Valley National Park	1994	Death Valley	13,647.6
	Joshua Tree National Park	1994	Twentynine Palms	3,196.0
	Kings Canyon National Park	1940	Fresno	1,869.2
	Lassen Volcanic National Park	1916	Mineral	430.5
	Pinnacles National Park	2013	Soledad	107.7
	Redwood National and State Parks	1968	Crescent City	455.3
	Sequoia National Park	1890	Three Rivers	1,635.1
	Yosemite National Park	1890	Yosemite National Park	3,080.7
Colorado	Black Canyon of the Gunnison National Park	1999	Gunnison	133.3
	Great Sand Dunes National Park and Preserve	2004	Mosca	173.9
	Mesa Verde National Park	1906	Mesa Verde	210.9
	Rocky Mountain National Park	1915	Estes Park	1,075.8
Hawaii	Haleakala National Park	1916	Makawao	117.7
	Hawai'i Volcanoes National Park	1916	Hawai`i National Park	1,308.9

Page 2 of 3

Figure 3.26 Completed National Parks worksheet

REVIEWING FORMATTING FOR INCONSISTENCIES

The first thing you are going to do is review the worksheet for formatting inconsistencies.

1. Scroll through the worksheet and locate the following formatting errors:
    - The formatting of the Utah label does not match the other states.
    - The Year Established values for Hawaii are not center aligned like the other years.
    - The cells for the Nevada data should have the same green fill color as the other alternating states.
    - The number of digits after the decimal place for the Size values is inconsistent. Also, these values should be formatted with Comma style to make them easier to read.

2. To fix these errors, complete the following steps:
    - Merge & Center A34:A38. Change the font size to 16 and apply Bold format.
    - Center align C28:C29.
    - Apply the green fill color to A31:E31 (be sure to match the green fill color of the other states).
    - Select E4:E43 and apply Comma Style. Use Increase Decimal and/or Decrease Decimal until one digit appears after the decimal place for all values.
3. While you're fixing errors, proofread the sheet and correct any typos.
4. Finally, let's add color to the two sheet tabs. The use of colored tabs assists in navigating between sheet tabs.
    - Right-click the **"Park Size"** sheet tab (**Mac users** hold down **Ctrl key and click the sheet tab)**
    - Point to **Tab Color** and choose a "**blue**" color.
    - Now right-click the "**Grades"** sheet tab, point to **Tab Color** and choose an "**orange**" color. That's it!

FINE-TUNING FORMATTING

Now that you have fixed the inconsistencies in the formatting, you decide to apply some formatting techniques to make the worksheet look even better. You are going to start by **vertically aligning** the names of the states within the cells.

1. Select A4:A43 (the cells with the state labels).
2. Click the Home tab on the ribbon.
3. In the Alignment group, click the **Middle Align** button (see **Figure 3.26**). Notice that the names of the states are now centered between the top and bottom borders of the cells.

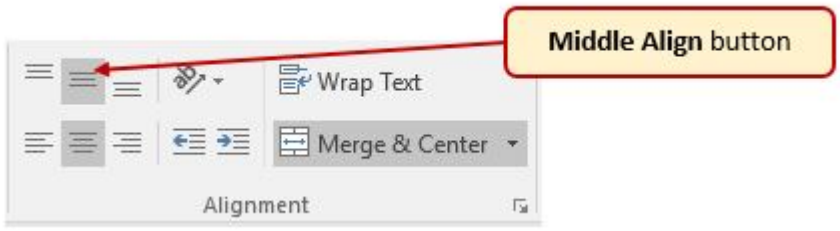
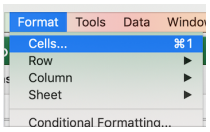


Figure 3.26 Alignment Group

The next new formatting skill is to change the label in E3 from Size (km2) to Size (km^2) with the 2 after km formatted with **superscript**.

1. Double-click on cell E3 to enter Edit mode
2. Select just the **2** (be careful not to select anything else).
3. On the ribbon (Home tab) click the dialog box launcher arrow in the Font group.

   Mac Users: there is no dialog box launcher for Excel for Mac. Instead, choose **Format** from the Menu Bar, click **Cells**: 

   then continue with Steps 4 and 5
4. In the Effects section of the Format Cells dialog box, check the box for **Superscript** (see **Figure 3-27**). Click OK.
5. Save the **CH3 Gradebook and Parks** file.

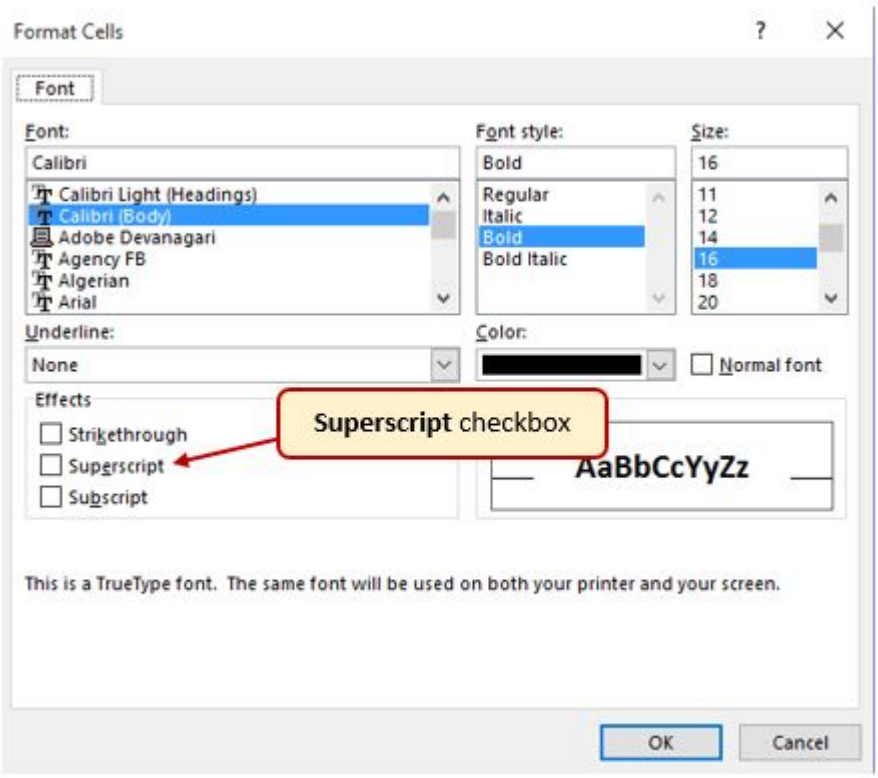


Figure 3.27 Font Tab in Format Cells Dialog Box

REPEATING COLUMN (AND ROW) LABELS

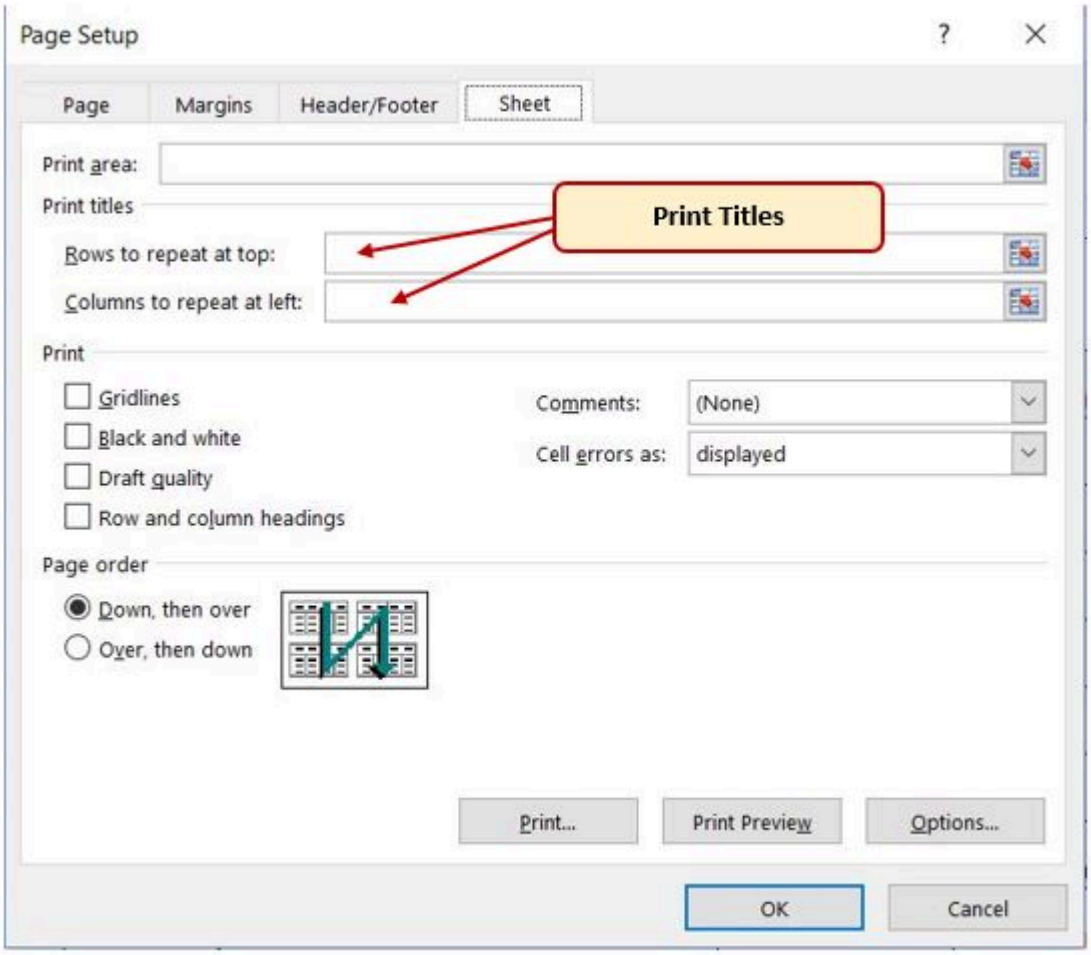
Now that you have fixed the cell and text formatting, you are ready to review the worksheet in Print Preview. You will notice that the worksheet is printing on multiple pages, and you cannot tell what each column of data represents on some of the pages.

1. With the *CH3-Gradebook and Parks* file still open, and the Parks tab selected, go to Back-

stage View by clicking the File tab on the ribbon. Select Print from the menu.

Mac Users: choose **File** from the Menu Bar, and then choose **Print**

2. Click through each of the pages. The worksheet is currently printing on four pages (Mac users may only see three pages but that is ok), with the City and Sizes columns printing on separate pages from the rest of the data.
3. Change the Orientation from Portrait to Landscape. This fits all of the columns on one page. All of the columns are now on the same page, but the second and third pages have no column labels to identify what information is in each column. You are going to use **Print Titles** to repeat the first three rows of the worksheet on each of the printed pages. To set **Print Titles** you need to exit Print Preview.
4. Exit Backstage View then click the Page Layout tab on the ribbon.
5. Click the Print Titles button in the Page Setup group on the ribbon. The dialog box shown in **Figure 3.28** should appear.
6. Click the Sheet tab if necessary.



7. Click in the **Rows to repeat at top:** box. *Be sure your insertion point is blinking in that box before moving on to the next step.*

8. In the worksheet, select Rows 1 through 3. The text **$1:$3** should now appear in the **Rows to repeat at top:** box.
9. Click OK.

You will not see a change to the worksheet in Normal view, so you will need to return to Print Preview. While looking in Print Preview, you will notice that the pages are breaking in inconvenient places.

1. Go to Print Preview and look at each of the pages. Notice that the first three rows are now repeated at the top of each page.
2. Exit Backstage View.

Skill Refresher

Creating Print Titles

1. Open the Page Setup dialog box and click the Sheet tab.
2. Click in the Rows to repeat at top: box or the Columns to repeat at left: box.
3. Click in the worksheet and select the row(s) or column(s) that you want to repeat on each page.

INSERTING PAGE BREAKS

Notice that the data for California is split between the first and second pages. You want all of the data for each state to be together on the same page, so you need to control the page breaks. You are going to start by inserting a page break before the California data to force it to start on the second page, then you will move the page break for the third page if needed. To make these changes you are going to work in **Page Break Preview**.

1. Click the View tab on the ribbon then click **Page Break Preview** in the Workbook Views Group. Your screen should look similar to **Figure 3.29**.

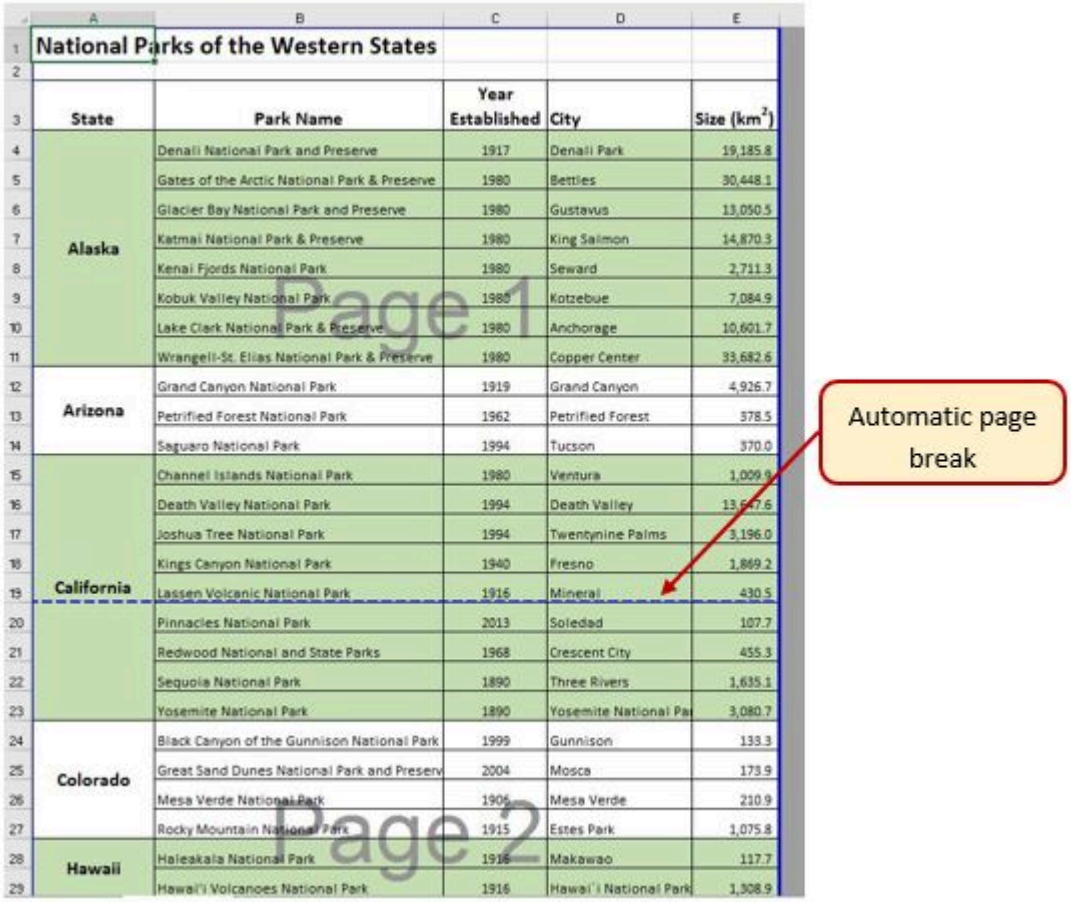


Figure 3.29 Page Break Preview

Mac Users: in the next paragraph below, the location of the automatic page breaks may be in different locations. That's ok.

In Page Break Preview, automatic page breaks are displayed as dotted blue lines. Notice the dotted blue lines after rows 13 and 28. These lines indicate where Excel will start a new page. For this worksheet, you want the first page to break before the California data, so you are going to insert a **manual page break**.

1. Select cell A15. When inserting a page break, you select the cell below where you want the page break to appear.
2. Click the Page Layout tab on the ribbon.
3. Click the Breaks button in the Page Setup group (see **Figure 3.30**).
4. Select **Insert Page Break** from the menu. There is now a solid blue line after row 14, which indicates a manual page break that was inserted.
5. Go to Print Preview. Notice that the California data now starts on the second page.

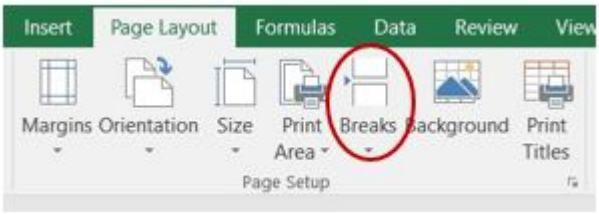


Figure 3.30 Breaks Button on Page Layout tab

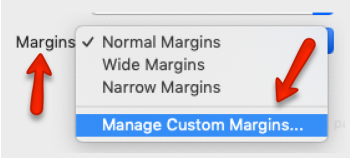
While looking at each page in Print Preview you decide that the third page should start with Montana. To make this change you are going to move the automatic page break that appears after Nevada.

1. Exit Backstage View. Switch back to Page Break Preview if needed.
2. Locate the next dotted blue line (automatic page break).
3. Put your pointer over the dotted blue line and it will switch to a vertical double-headed arrow. Click on the dotted blue line and drag it **above** Montana.
4. Release the mouse button when the line is above row 30 (above Montana). The line will now be a solid blue line, indicating a manual page break.
5. Go to Print Preview. The Montana data now appears at the top of the third page.

While evaluating the pages in Print Preview you decide that there is too much white space at the bottom of the pages. To fix this, you are going to center the contents vertically on the pages.

1. Click the Page Setup link at the bottom of the Settings section of Backstage View to open the Page Setup dialog box.

   Mac Users: there is no "Page Setup link" in Print Preview for Excel for Mac. Click the Margins list arrow instead, and choose "Manage Custom Margins" then continue with the steps below.



2. Click on the Margins tab.
3. In the Center on page section, check the box for Vertically then click OK.
4. Review each page in Print Preview to see the changes. Exit Backstage View.

CREATING A HEADER AND FOOTER USING PAGE LAYOUT VIEW

Now that the worksheet is printing on three pages, with page breaks in appropriate places, you are ready to add a header with the current date and filename. You will also add a footer with the

page number and the total number of pages that will appear as **Page 1 of 3**. You are going to edit the header and footer in Page Layout View.

1. Click the View tab on the ribbon and click the Page Layout button in the Workbook Views group.
2. The white space at the top of the worksheet should say Add header. Place the mouse pointer over the left section of the Header and click to activate that section.

   Mac Users should make sure the mouse pointer turns into a small page icon  then click in the left section of the Header
3. Click the Header & Footer Tools Design tab on the ribbon.
4. Click the **Current Date** button in the Header & Footer Elements group (see **Figure 3.31**). Inserting the date this way will insert a field that will update every time the workbook is opened.
5. Click in the right section of the Header. Click the **Filename** button in the Header & Footer Elements group (see **Figure 3.31**). Inserting the filename this way will insert a field that will update if the filename is changed.
6. Click the **Go to Footer** button in the Navigation group of commands.
7. In the center section of the footer, type the word *Page* with a space after it.
8. Click the **Page Number** button in the Header & Footer Elements group (see **Figure 3.31**), then type a space after the **&[Page]** code that appears.
9. Type the word *of* with a space after it, then click the **Number of Pages** button in the Header & Footer Elements group (see **Figure 3.31**). The footer should match **Figure 3.32**.
10. Click anywhere on the worksheet to close the Footer editing.
11. Review the worksheet again in Print Preview. Pay careful attention to the page numbers in the footer to ensure they will print correctly, then exit Backstage View.
12. View the correct print preview screenshot below in Figure 3.33
13. Check the spelling on all of the worksheets and make any necessary changes. Save and submit the ***CH3-Gradebook and Parks*** workbook.

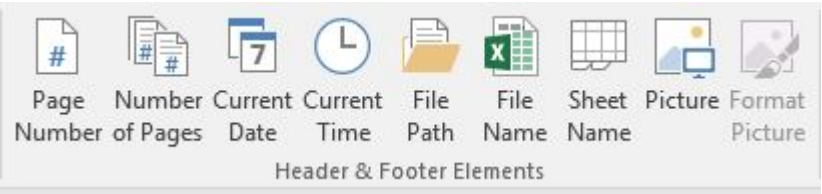


Figure 3.31 Header & Footer Elements buttons

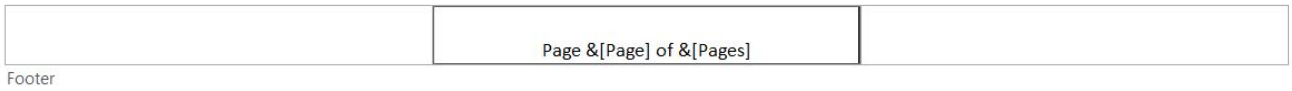
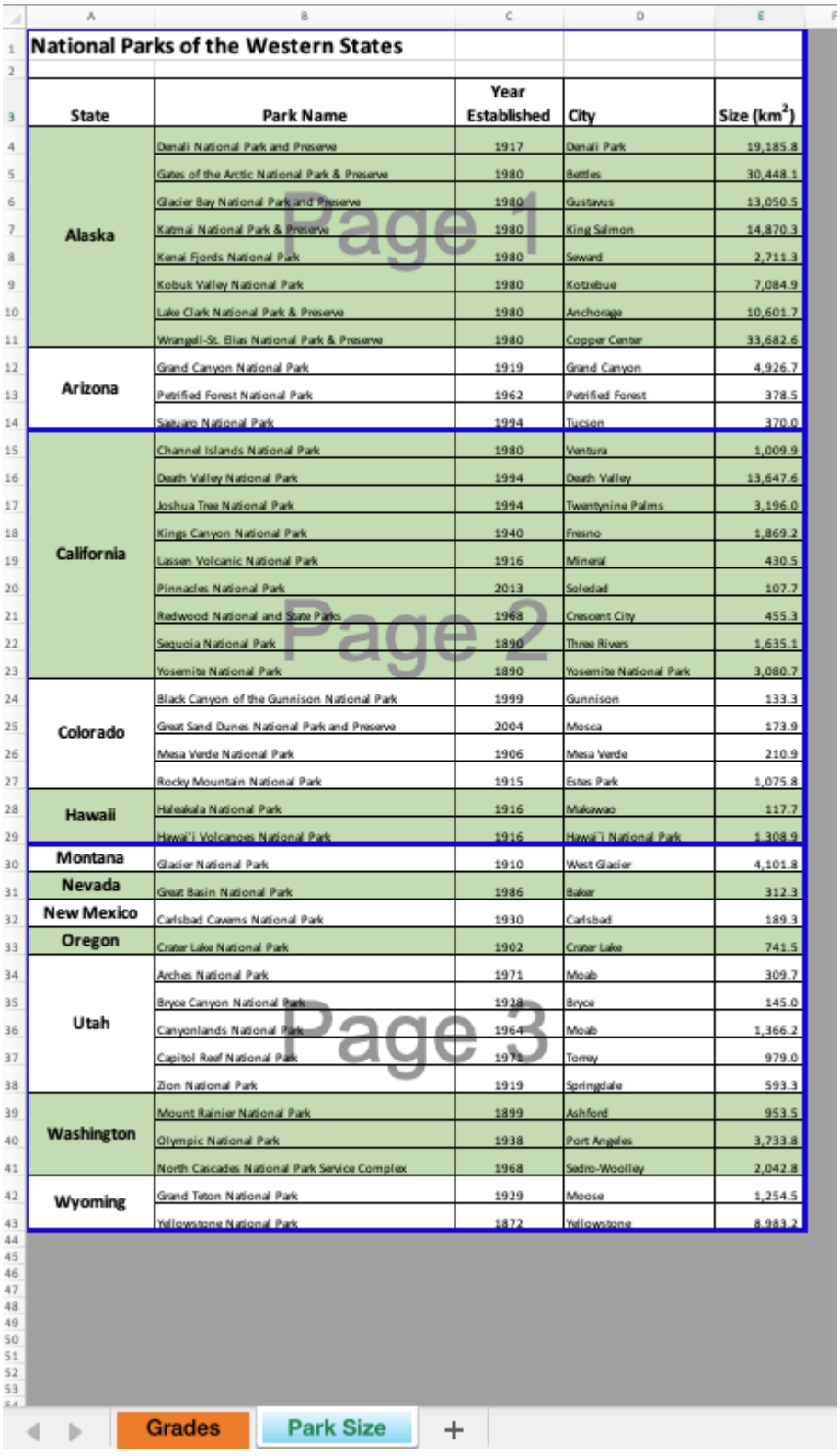


Figure 3.32 Completed Footer



National Parks of the Western States				
State	Park Name	Year Established	City	Size (km^2)
Alaska	Denali National Park and Preserve	1917	Denali Park	19,185.8
	Gates of the Arctic National Park & Preserve	1980	Bettles	30,448.1
	Glacier Bay National Park and Preserve	1980	Gustavus	13,050.5
	Katmai National Park & Preserve	1980	King Salmon	14,870.3
	Kenai Fjords National Park	1980	Seward	2,711.3
	Kobuk Valley National Park	1980	Kotzebue	7,084.9
	Lake Clark National Park & Preserve	1980	Anchorage	10,601.7
	Wrangell-St. Elias National Park & Preserve	1980	Copper Center	33,682.6
Arizona	Grand Canyon National Park	1919	Grand Canyon	4,926.7
	Petrified Forest National Park	1962	Petrified Forest	378.5
	Saguaro National Park	1994	Tucson	370.0
California	Channel Islands National Park	1980	Ventura	1,009.9
	Death Valley National Park	1994	Death Valley	13,647.6
	Joshua Tree National Park	1994	Twentynine Palms	3,196.0
	Kings Canyon National Park	1940	Fresno	1,869.2
	Lassen Volcanic National Park	1916	Mineral	430.5
	Pinnacles National Park	2013	Soledad	107.7
	Redwood National and State Parks	1968	Crescent City	455.3
	Sequoia National Park	1890	Three Rivers	1,635.1
	Yosemite National Park	1890	Yosemite National Park	3,080.7
Colorado	Black Canyon of the Gunnison National Park	1999	Gunnison	133.3
	Great Sand Dunes National Park and Preserve	2004	Mosca	173.9
	Mesa Verde National Park	1906	Mesa Verde	210.9
	Rocky Mountain National Park	1915	Estes Park	1,075.8
Hawaii	Haleakala National Park	1916	Makawao	117.7
	Hawai'i Volcanoes National Park	1916	Hawai'i National Park	1,308.9
Montana	Glacier National Park	1910	West Glacier	4,101.8
Nevada	Great Basin National Park	1986	Baker	312.3
New Mexico	Carlsbad Caverns National Park	1930	Carlsbad	189.3
Oregon	Crater Lake National Park	1902	Crater Lake	741.5
Utah	Arches National Park	1971	Moab	309.7
	Bryce Canyon National Park	1928	Bryce	145.0
	Canyonlands National Park	1964	Moab	1,366.2
	Capitol Reef National Park	1971	Torrey	979.0
	Zion National Park	1919	Springdale	593.3
Washington	Mount Rainier National Park	1899	Ashford	953.5
	Olympic National Park	1938	Port Angeles	3,733.8
	North Cascades National Park Service Complex	1968	Sedro-Woolley	2,042.8
Wyoming	Grand Teton National Park	1929	Moose	1,254.5
	Yellowstone National Park	1872	Yellowstone	8,983.2

Figure 3.3 – Print Preview of Parks sheet

Skill Refresher

Inserting Page Numbers

1. In Page Layout View, click in the section of the header or footer where you want the page number to appear.
2. Type the word Page, followed by a space, and then click the Page Number button in the Header & Footer Elements group on the Header & Footer Tools Design ribbon. This will create Page 1.
3. If desired, type a space after the &[Page] code then type the word of followed by a space. Then click the Number of Pages button. This will create Page 1 of 4.

Key Takeaways

- Always check the formatting of your worksheets for consistency.
- If a worksheet is printing on multiple pages, use Print Titles to repeat rows at the top and/or columns at the left of every page to make it easier to interpret the data.
- Insert manual page breaks as needed in Page Break Preview to control where a new page begins.
- Multiple page worksheets should include the page number in either the header or footer. Be sure to insert the Page Number element so that the correct page number will display on each page of the worksheet.

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3.5 Chapter Practice

HOUSEHOLD BUDGET

Download Data File: PR3 Data

Etta and Lucian Redding are a recently married couple living in Portland, Oregon. Lucian works part time and attends the local community college. Etta works as a marketing manager at a clothing company in North Portland. They are trying to decide if they can afford to move to a better apartment, one that is closer to work and school. They want to use Excel to examine their household budget. They have started their budget spreadsheet, but they need your help with it.

1. Open the file named **PR3 Data** and then save it as **PR3 Redding**.
2. Insert two new rows at the top of the worksheet.
3. Enter the following text:

A2	Category
B2	Item
C2	January
O2	Yearly Total (adjust column width as needed to fit this text)

1. Using the text in cell C2, use Autofill to fill in the months February through December in cells D2:N2. Adjust column widths as needed to fit the names of the months in these columns.
2. Bold and center align all of the headings in Row 2.
3. Type "**Redding Family Budget"** in A1. Merge & Center A1:O1. Make this text 22 point **bold**.
4. Next you need to complete the monthly values for some of the income and expense items. In the rows for Income #1, Income #2, Mortgage/Rent, Homeowners/Rent Insurance, Car Insurance, Car Payment, and Gym Fees/Memberships, copy the values for January to the cells for February through December.
5. Use the Totals tab in the Quick Analysis tool to add the SUM to Column O. Delete the formulas from O7, O17, O24, O32, and O38.

   Mac Users should use the AutoSum tool to calculate the totals in Column O. Since you are using the AutoSum tool, you may not have to delete any formulas in the cells listed

in Step 5 above. Also, the Quick Analysis tool will automatically bold the values in Column O. Mac Users should bold cells O3:O45.

6. In C6: N6, use the SUM function to calculate the Total Income for each month.
7. Similar to step 6, use the SUM function to calculate the Total Home Expenses, Total Daily Living Expenses, Total Transportation Expenses, Total Entertainment Expenses, and Total Personal Expenses for each month.
8. Use the SUM function to calculate the Yearly Total Personal Expenses in cell O45.
9. Format the numerical data in Row 3 as Currency with no decimal places, and with a top border. Format all the total rows as Currency with no decimal places and with a top border (Rows 6, 16, 23, 31, 37, and 45).
10. Apply the Comma format with no decimal places in all the other rows.
11. In A47, type "**Total Expenses**".
12. In C47, enter a formula that adds together all of the **expense category totals** for January. Copy the formula in C47 to D47:O47.
13. In A49, type "**Net Income**". Bold and indent this text. Also bold C49:N49
14. In C49, enter a formula that calculates the difference between Total Income and Total Expenses (=Total Income-Total Expenses) for January. Copy this formula to D49:O49.
15. Format the data in Rows 47 and 49 as Currency with no decimal places. Bold O47 and O49. Add a Top and Double Bottom Border to the data in Row 49.
16. Select C49:N49. Use the Quick Analysis tool to add data bars to this data. Mac Users should use the Conditional Formatting tool on the Ribbon. The negative values should automatically have a red data bar and the positive values will have a blue data bar.
17. In B50, type "**New Home?**". Enter an IF statement in C50 that displays the word "No" if the amount in C49 is less than or equal to zero and "Maybe" if the amount is greater than zero. Copy C50 to D50:N50.
18. Check to see if your IF statement worked correctly in row 50. If the cells say "No" when the data bar in the cell above it is red and "Maybe" when the data bar in the cell above it is blue, your IF statement is correct.
19. Review the worksheet in Print Preview. Make any changes needed to make the worksheet print on one page with landscape orientation.
20. Rename the **"Sheet 1"** sheet tab:
    - Double-click the "Sheet 1" tab
    - Type: **Budget** and press Enter
21. Change the color of the sheet tab:
    - Right-click the "Budget" sheet tab

- Mac Users should hold down the **CTRL key** and click the Budget sheet tab
- Point to "Tab Color", choose a green color

22. Check the spelling on all of the worksheets and make any necessary changes. Save the **PR3 Redding** workbook.
23. Compare your work with the self-check answer key **below** and then submit the **PR3 Redding** workbook as directed by your instructor.

Redding Family Budget

Category	Item	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
Income	Income #1	$1,645	$1,645	$1,645	$1,645	$1,645	$1,645	$1,645	$1,645	$1,645	$1,645	$1,645	$1,645	**$19,740**
	Income #2	2,010	2,010	2,010	2,010	2,010	2,010	2,010	2,010	2,010	2,010	2,010	2,010	**24,120**
	Other Income													-
Total Income		$3,655	$3,655	$3,655	$3,655	$3,655	$3,655	$3,655	$3,655	$3,655	$3,655	$3,655	$3,655	**$43,860**
Home	Mortgage/Rent	920	920	920	920	920	920	920	920	920	920	920	920	**11,040**
	Homeowners/Rent Insurance	8	8	8	8	8	8	8	8	8	8	8	8	**96**
	Utilities	255	230	200	195	150	165	175	165	160	160	200	235	**2,290**
	Cable/Internet													-
	Trash													-
	Home Maintenance													-
	Misc. House Stuff													-
	Lawn/Garden													-
Total Home Expenses		$1,183	$1,158	$1,128	$1,123	$1,078	$1,093	$1,103	$1,093	$1,088	$1,088	$1,128	$1,163	**$13,426**
Daily Living	Groceries	875	730	795	825	855	815	885	920	942	875	975	1,050	**10,542**
	Clothing													-
	Books & Supplies	2,115					2,419		3,275					**7,809**
	Child Care													-
	Pets													-
Total Daily Living Expenses		$2,990	$730	$795	$825	$855	$3,234	$885	$4,195	$942	$875	$975	$1,050	**$18,351**
Transportation	Car Insurance	265	265	265	265	265	265	265	265	265	265	265	265	**3,180**
	Car Maintenance													-
	Car Payments	210	210	210	210	210	210	210	210	210	210	210	210	**2,520**
	Bus/Train Fair													-
	Gas (Car)													-
	Parking													-
Total Transportation Expenses		$475	$475	$475	$475	$475	$475	$475	$475	$475	$475	$475	$475	**$5,700**
Entertainment	Travel													-
	Movies													-
	Special Occasions													-
	Gifts													-
Total Entertainment Expenses		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
Personal	Subscriptions													-
	Phone	120	131	125	138	120	145	140	135	145	135	165	175	**1,674**
	Gym Fees/Memberships	60	60	60	60	60	60	60	60	60	60	60	60	**720**
	Salon/Barber													-
	Eating Out													-
	Miscellaneous	200	250	120	180	250	120	150	135	200	250	270	350	**2,475**
Total Personal Expenses		$380	$441	$305	$378	$430	$325	$350	$330	$405	$445	$495	$585	**$4,869**
Total Expenses		$5,028	$2,804	$2,703	$2,801	$2,838	$5,127	$2,813	$6,093	$2,910	$2,883	$3,073	$3,273	**$42,346**
Net Income		-$1,373	$851	$952	$854	$817	-$1,472	$842	-$2,438	$745	$772	$582	$382	**$1,514**
	New Home?	No	Maybe	Maybe	Maybe	Maybe	No	Maybe	No	Maybe	Maybe	Maybe	Maybe	

Budget

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3.6 Chapter Scored

MIDASCOFFEE COMPANY

Download Data File: SC3 data

MidasCoffee: Ruth Kobran owns a coffee supply company named MidasCoffee. She needs some help writing the formulas for the order form she uses to invoice customers. You will need to write the formulas for all of the calculations on the form. Some of the more complex parts are determining if the customer will get a discount (based on the customer status) as well as the shipping charge (orders over $199 get free shipping). You will use IF functions for both of those calculations.

1. Open the **SC3 Data** workbook and save the workbook as **SC3 MidasCoffee**.
2. Enter the following order information:
   Order #: **56894**
   Order Date: use a function that displays the current date
3. Enter the following Billing Information:
   Samantha Raitt
   4270 SW Cooper Ln, Portland, OR 97225
   503-674-1632
   samantha.raitt@zmail.com
4. For the Shipping Information, create formulas using cell references to display the corresponding information from the Billing Information section. For example, the Customer cell will display the name of the customer in cell C11.
5. In the range B19:E22, enter the following item orders:

Item #	Description	Qty	Unit Price
K56	Dark Mocha K-Cups (12 pack)	1	11.99
G03	Decaf Dark Roast – Ground (1 lb.)	3	12.99
B07	Organic Dark Roast – Whole Bean (1 lb.)	2	14.99
K52	Chai Latte K-Cups (12 pack)	3	10.99

6. In cell F19, enter an IF function that tests whether the order quantity in cell D19 is greater than 0 (zero). lf it is, return the value of the Qty (in D19) multiplied by the Unit Price (in E19); otherwise, return no text by entering “”. *Hint: You will need to use a formula*

for the Value if True argument.

7. Copy/fill this formula into the other cells in the range F19:F25. *Hint: be sure to copy the formula to all of the Item Total cells, even if it is a blank row. You want the worksheet to be prepared for orders with more items in the future.*
8. In cell F26, calculate the sum of all of the Item Total cells.
9. In cell F27, use an IF function to calculate the discount amount for this order based on the customer's status (which is found in F16). If the customer's status is Preferred, the discount amount will be the Order Subtotal times the discount percentage found in cell B29; otherwise the discount amount will be 0 (zero). *Hint: You will need to use a formula for the Value if True argument.*
10. Test your IF function to make sure that it still works if the customer is NOT preferred by deleting the word Preferred in F16. Make sure you do not end up with an error message! If you get an error message, check the IF function and make the changes needed.
11. Calculate the Discounted Total for this order in cell F28. *Hint: Use a simple subtraction formula.*
12. In cell F29, use an IF function to display the correct Shipping Charge, based on the amount of the Discounted Total. If the Discounted Total is greater than or equal to the Free Shipping Minimum found in cell B28, the Shipping Charge is 0 (zero); otherwise, the Shipping Charge is 5% of the Discounted Total. *Hint: You will need to use a formula for the Value if False to calculate what 5% of the Discounted Total will be.*
13. Calculate the Invoice Total in cell F31. *Hint: This will be the total of the Discounted Total and the Shipping Charge.*
14. Take a critical look at your worksheet to ensure that all of the number and cell formatting is professional.
15. Review the worksheet in Print Preview. Make any changes needed to make the worksheet print on one page.
16. Check the spelling on all of the worksheets and make any necessary changes. Save the **SC3 MidasCoffee** workbook.
17. Submit the **SC3 Midas Coffee** workbook as directed by your instructor.

ATTRIBUTION

CHAPTER 4 – PRESENTING DATA WITH CHARTS

One of the most important things to consider when using charts in Excel is that they are intended to be used for communicating an idea to an audience. Your audience can be reading your charts in a written document or listening to you in a live presentation. In fact, Excel charts are often imported or pasted into Word documents or PowerPoint slides, which serve this very purpose of communicating ideas to an audience. Although there are no rules set in stone for using specific charts for certain data types, some chart types are designed to communicate certain messages better than others. This chapter explores numerous charts that can be used for a variety of purposes. In addition, we will examine formatting charts and using those charts in Word and PowerPoint documents.

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4.1 Choosing a Chart Type

LEARNING OBJECTIVES

1. Construct a line chart to show timeline and comparison trends.
2. Learn how to use a column chart to show one and two frequency distributions.
3. Create and format a map chart.
4. Insert a funnel chart.
5. Learn how to use a pie chart to show the percent of the total for a data set.
6. Compare the difference between a column chart and a bar chart.
7. Construct column charts to show how a percent of total changes over time.

This section reviews the most commonly used Excel chart types. To demonstrate the variety of chart types available in Excel, it is necessary to use a variety of data sets. This is necessary not only to demonstrate the construction of charts but also to explain how to choose the right type of chart given your data and the idea you intend to communicate.

CHOOSING A CHART TYPE

Before we begin, let's review a few key points you need to consider before creating any chart in Excel.

1. **The first is identifying your idea or message**. It is important to keep in mind that the primary purpose of a chart is to present quantitative information to an audience. Therefore, you must first decide what message or idea you wish to present. This is critical in helping you select specific data from a worksheet that will be used in a chart. Throughout this chapter, we will reinforce the intended message first before creating each chart.
2. **The second key point is selecting the right chart type**. The chart type you select will depend on the data you have and the message you intend to communicate.
3. **The third key point is identifying the values that should appear on the X and Y axes**. One of the ways to identify which values belong on the X and Y axes is to sketch

the chart on paper first. If you can visualize what your chart is supposed to look like, you will have an easier time selecting information correctly and using Excel to construct an effective chart that accurately communicates your message. **Table 4.1** "Key Steps Before Constructing an Excel Chart" provides a brief summary of these points.

Integrity Check

Carefully Select Data When Creating a Chart

Just because you have data in a worksheet does not mean it must all be placed onto a chart. When creating a chart, it is common for only specific data points to be used. To determine what data should be used when creating a chart, you must first identify the message or idea that you want to communicate to an audience.

Table 4.1 Key Steps before Constructing an Excel Chart

Step	Description
Define your message.	Identify the main idea you are trying to communicate to an audience. If there is no main point or important message that can be revealed by a chart, you might want to question the necessity of creating a chart.
Identify the data you need.	Once you have a clear message, identify the data on a worksheet that you will need to construct a chart. In some cases, you may need to create formulas or consolidate items into broader categories.
Select a chart type.	The type of chart you select will depend on the message you are communicating and the data you are using.
Identify the values for the X and Y axes.	After you have selected a chart type, you may find that drawing a sketch is helpful in identifying which values should be on the X and Y axes. In Excel, the axes are: The "category" axis. Usually the horizontal axis – where the labels are found. The "value" axis. Usually the vertical axis – where the numbers are found.

TIME SERIES TREND: LINE CHART 1

The first chart we will demonstrate is a line chart. Figure 4.1 shows part of the data that will be used to create two line charts. This chart will show the trend of the NASDAQ stock index.

Read more: http://www.investopedia.com/terms/n/nasdaq.asp

This chart will be used to communicate a simple message: to show how the index has performed over a two-year period. We can use this chart in a presentation to show whether stock prices have been increasing, decreasing, or remaining constant over the designated period of time.

Before we create the line chart, it is important to identify why it is an appropriate chart type given the message we wish to communicate and the data we have. When presenting the trend for any data over a designated period of time, the most commonly used chart types are the line chart and the column chart. With the column chart, you are limited to a certain number of bars or data points. As shown below in **Figure 4.1**, as the number of bars increases on a column chart, it becomes increasingly difficult to read. In our first example, there are 24 points of data used to construct the chart. This is generally too many data points to put on a column chart, which is why we are using a line chart.

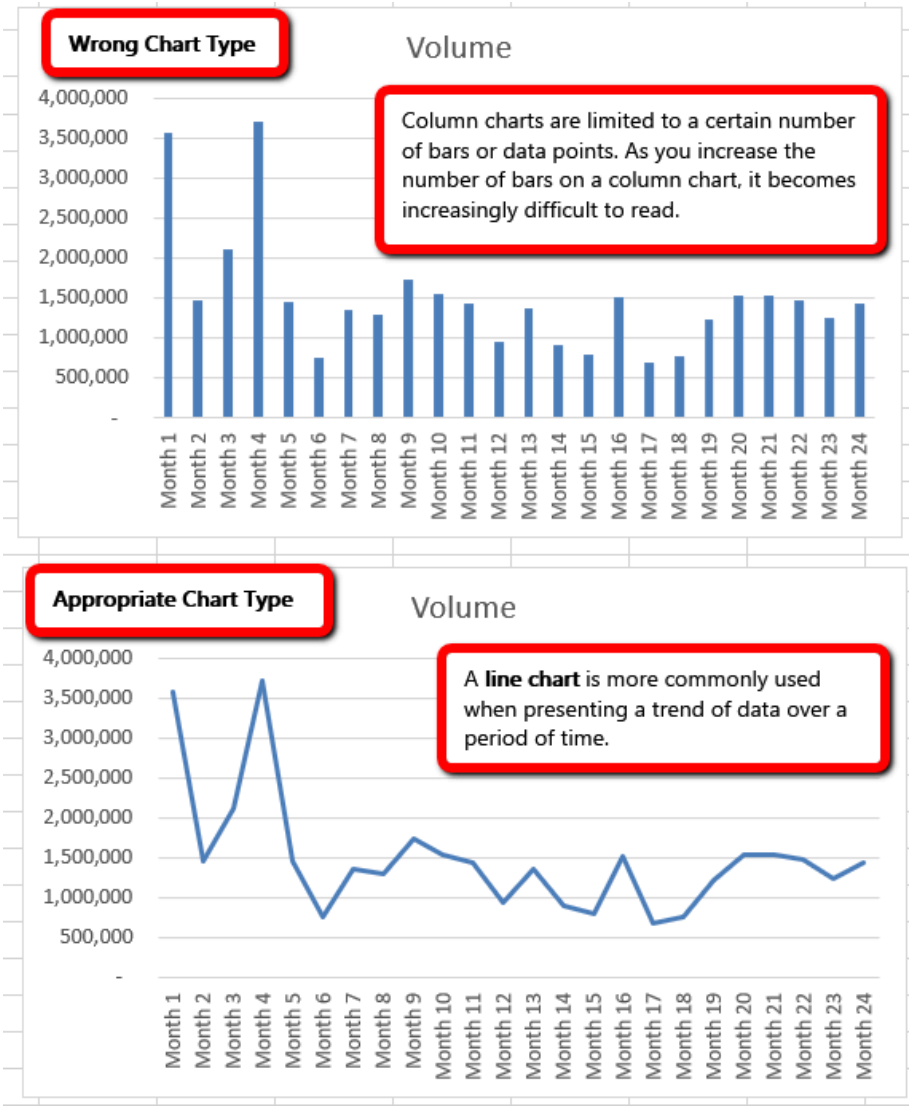


Figure 4.1 Chart Types

Our line chart will show the **Volume** of sales for the NASDAQ on the Y-axis and the **Month** number on the X-axis. Notice when we select the information we are including the column headings/labels. Excel will use the column headings/labels to identify each axis. Excel named the horizontal axis labels Month and the Vertical axis series Volume.
The following steps explain how to construct this chart:

Download Data file: CH4 Data

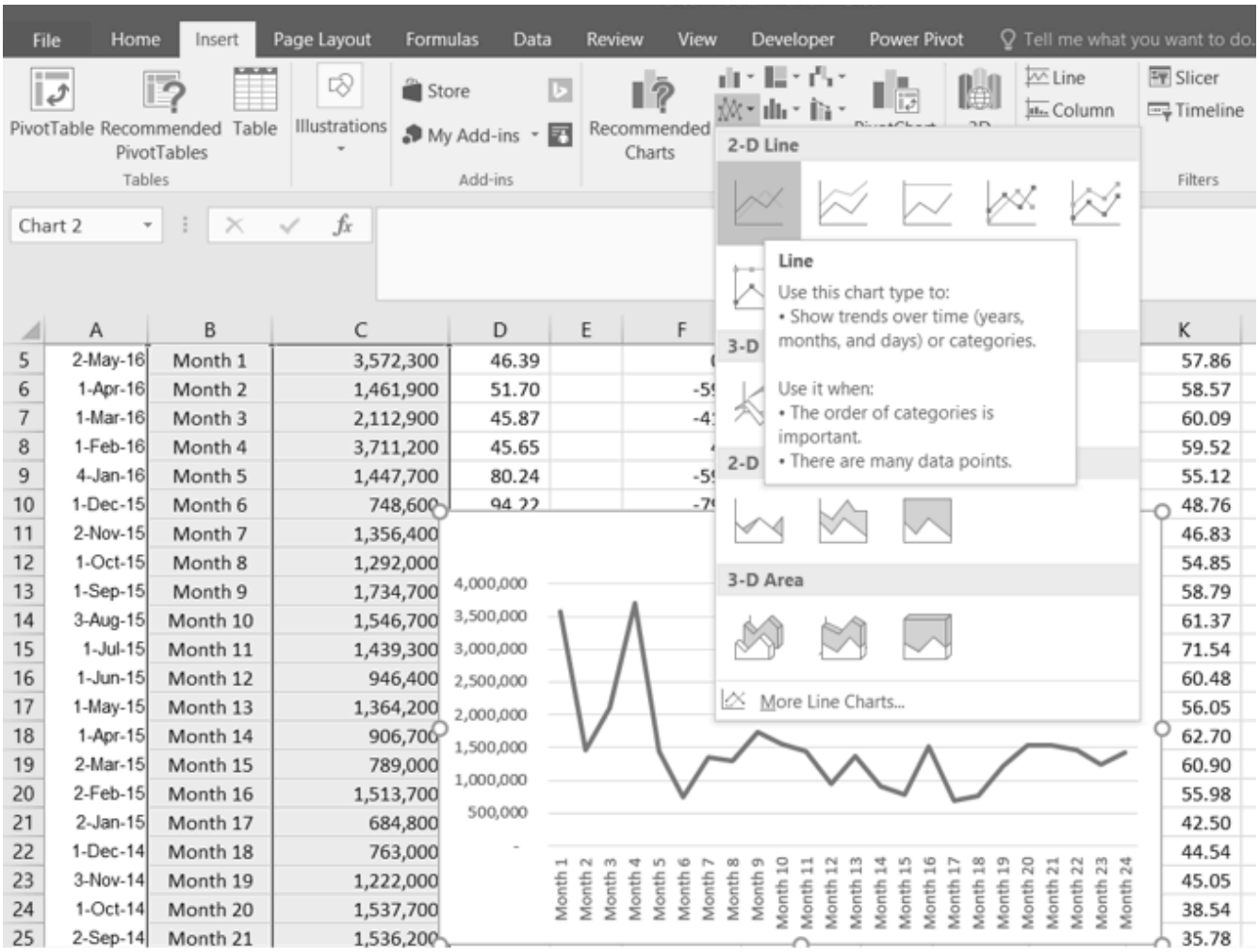
1. Open data file *CH4 Data* and save a file to your computer as **CH4 Charting**.

2. Navigate to the **Stock Trend** worksheet.

3. Highlight the range **B4:C28** on the Stock Trend worksheet. (Note – you have selected a label in the first row and more labels in column B. Watch where they show up in your completed chart.)

4. Click the Insert tab of the ribbon.

5. Click the **Line** button in the **Charts** group of commands. Click the first option from the list, which is a basic 2D Line Chart (see **Figure 4.2**). Notice Excel adds, or embeds, the line chart into the worksheet.



	A	B	C	D	E	F	K
5	2-May-16	Month 1	3,572,300	46.39			57.86
6	1-Apr-16	Month 2	1,461,900	51.70		-5	58.57
7	1-Mar-16	Month 3	2,112,900	45.87		-4	60.09
8	1-Feb-16	Month 4	3,711,200	45.65			59.52
9	4-Jan-16	Month 5	1,447,700	80.24		-5	55.12
10	1-Dec-15	Month 6	748,600	94.22		-7	48.76
11	2-Nov-15	Month 7	1,356,400				46.83
12	1-Oct-15	Month 8	1,292,000				54.85
13	1-Sep-15	Month 9	1,734,700				58.79
14	3-Aug-15	Month 10	1,546,700				61.37
15	1-Jul-15	Month 11	1,439,300				71.54
16	1-Jun-15	Month 12	946,400				60.48
17	1-May-15	Month 13	1,364,200				56.05
18	1-Apr-15	Month 14	906,700				62.70
19	2-Mar-15	Month 15	789,000				60.90
20	2-Feb-15	Month 16	1,513,700				55.98
21	2-Jan-15	Month 17	684,800				42.50
22	1-Dec-14	Month 18	763,000				44.54
23	3-Nov-14	Month 19	1,222,000				45.05
24	1-Oct-14	Month 20	1,537,700				38.54
25	2-Sep-14	Month 21	1,536,200				35.78

Figure 4.2 Selecting the Basic Line Chart

Why?

Line Chart vs. Column Chart

We can use both a line chart and a column chart to illustrate a trend over time. However, a line chart is far more effective when there are many periods of time being measured. For example, if we are measuring fifty-two weeks, a column chart would require fifty-two bars. A general rule of thumb is to use a column chart when twenty bars or less are required. A column chart becomes difficult to read as the number of bars exceeds twenty.

Figure 4.3 shows the embedded line chart in the Stock Trend worksheet. Do you see where your labels showed up on the chart?

Notice that additional tabs, or contextual tabs, are added to the ribbon. We will demonstrate the commands in these tabs throughout this chapter. These tabs appear only when the chart is activated.

Note: Excel 2010 uses three contextual tabs for charts. Later versions use only two. Each has all the same tools. They are just organized a little differently.

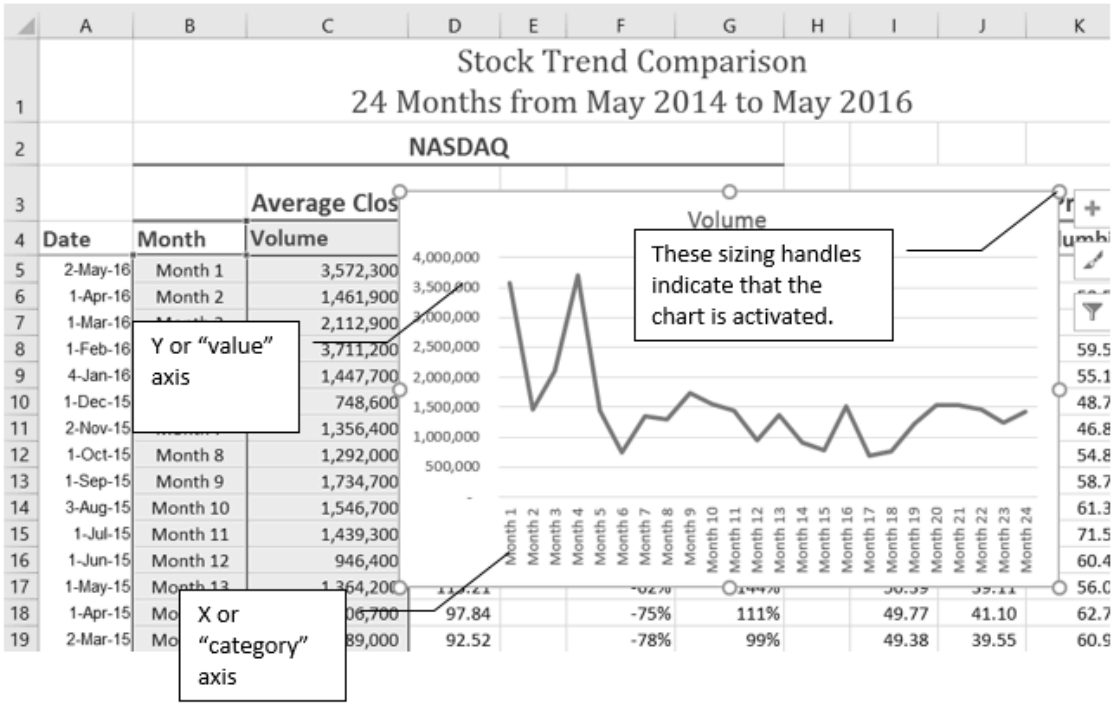


Figure 4.3 Embedded Line Chart in the Stock Trend Worksheet

As shown in **Figure 4.3**, the embedded chart is not placed in an ideal location on the worksheet since it is covering several cell locations that contain data. The following steps demonstrate common adjustments that are made when working with embedded charts:

1. Moving a chart: Click and drag the upper left corner of the chart to the corner of cell B30.

Note: Keep an eye on your pointer. It will change into  when you are in the right place to move your chart.

2. Resizing a chart: Place the mouse pointer over the bottom lower corner sizing handle, drag and drop to approximately the end of Column I, and Row 45.

Note: keep an eye on your pointer. It will change into  when you are in the right place to resize your chart

3. **Adjusting the chart title**: Click the chart title once. Then click in front of the first letter. You should see a blinking cursor in front of the letter. This allows you to modify the title of the chart.

4. Type the following in front of the first letter in the chart title: **May 2014-2016 Trend for NASDAQ Sales**.

5. Click anywhere outside of the chart to deactivate it.

6. Save your work.

Figure 4.4 shows the line chart after it is moved and resized. Notice that the sizing handles do not appear around the perimeter of the chart. This is because the chart has been deactivated. To activate the chart, click anywhere inside the chart perimeter.

	A	B	C	D	E	F	G	H	I	J
24	1-Oct-14	Month 20	1,537,700	82.59		-57%	78%		43.85	36.
25	2-Sep-14	Month 21	1,536,200	72.65		-57%	57%		39.64	37.
26	1-Aug-14	Month 22	1,467,900	65.49		-59%	41%		38.39	37.
27	1-Jul-14	Month 23	1,246,200	65.00		-65%	40%		39.00	39.
28	2-Jun-14	Month 24	1,428,300	71.33		-60%	54%		38.36	39.

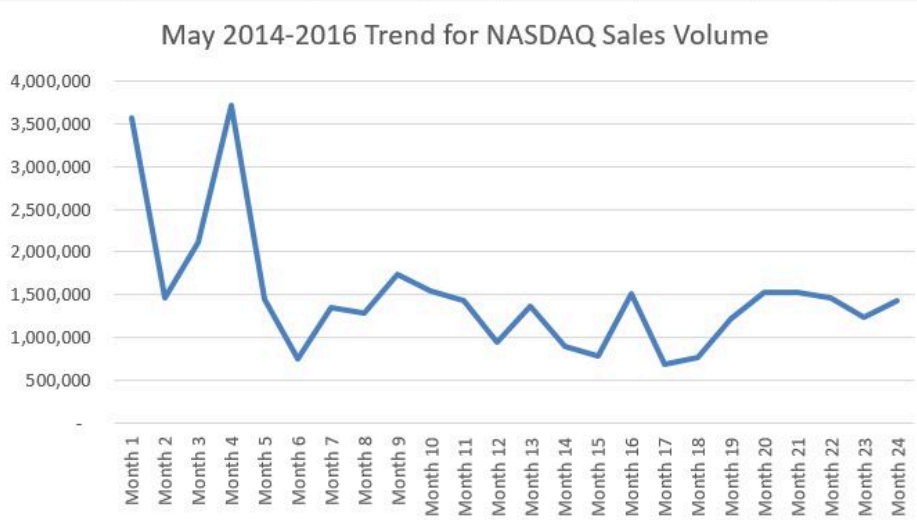


Figure 4.4 Line Chart Moved and Resized

Integrity Check

When using line charts in Excel, keep in mind that anything placed on the X-axis is considered a descriptive label, not a numeric value. This is an example of a category axis. This is important because there will never be a change in the spacing of any items placed on the X-axis of a line chart. If you need to create a chart using numeric data on the category axis, you will have to modify the chart. We will do that later in the chapter.

Skill Refresher

Inserting a Line Chart

1. Highlight a range of cells that contain data that will be used to create the chart. Be sure to

include labels in your selection.

2. Click the Insert tab of the ribbon.
3. Click the Line button in the Charts group.
4. Select a format option from the Line Chart drop-down menu.

ADJUSTING THE Y-AXIS SCALE

After creating an Excel chart, you may find it necessary to adjust the scale of the Y-axis. Excel automatically sets the maximum value for the Y-axis based on the data used to create the chart. The minimum value is usually set to zero. That is usually a good thing. However, depending on the data you are using to create the chart, setting the minimum value to zero can substantially minimize the graphical presentation of a trend. For example, the trend shown in Figure 4.4 appears to be increasing slightly in recent months. The presentation of this trend can be improved if the minimum value started at 500,000. The following steps explain how to make this adjustment to the Y-axis:

1. Click anywhere on the Y (value or vertical) axis on the **May 2014-2016 Trend for NASDAQ Sales Volume** line chart (Stock Trend worksheet).

2. Right Click and select **Format Axis.** The Format Axis Pane should appear, as shown in **Figure 4.5**.

 Mac Users: Hold down the Control key and click the Y axis. Then choose **Format Axis.**

Note: If you do not see "Format Axis . . . on your menu, you have not right-clicked in the correct spot. Press "Escape" to turn the menu off and try again

3. In the Format Axis Pane, click the input box for the "**Minimum**" axis option and **delete** the zero. Then type the number **500000** and hit Enter. As soon as you make this change, the Y axis on the chart adjusts.

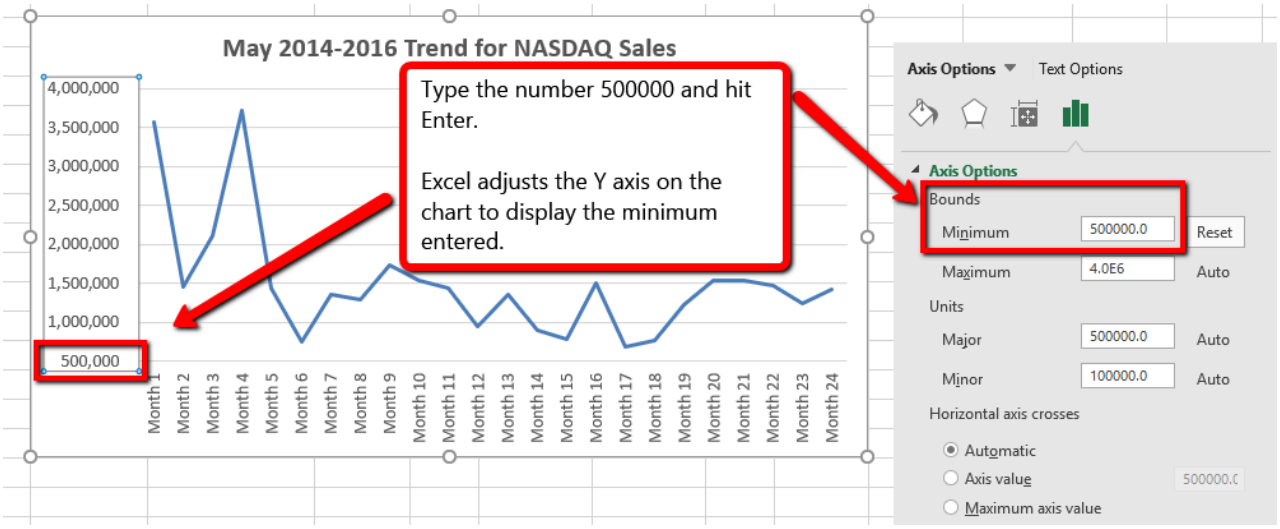


Figure 4.5 Format Axis Pane

4. Click the X in the upper right corner of the Format Axis pane to close it.
5. Save your work.

Figure 4.6 shows the change in the presentation of the trend line. Notice that with the Y axis starting at 500,000, the trend for the NASDAQ is more pronounced. This adjustment makes it easier for the audience to see the magnitude of the trend.

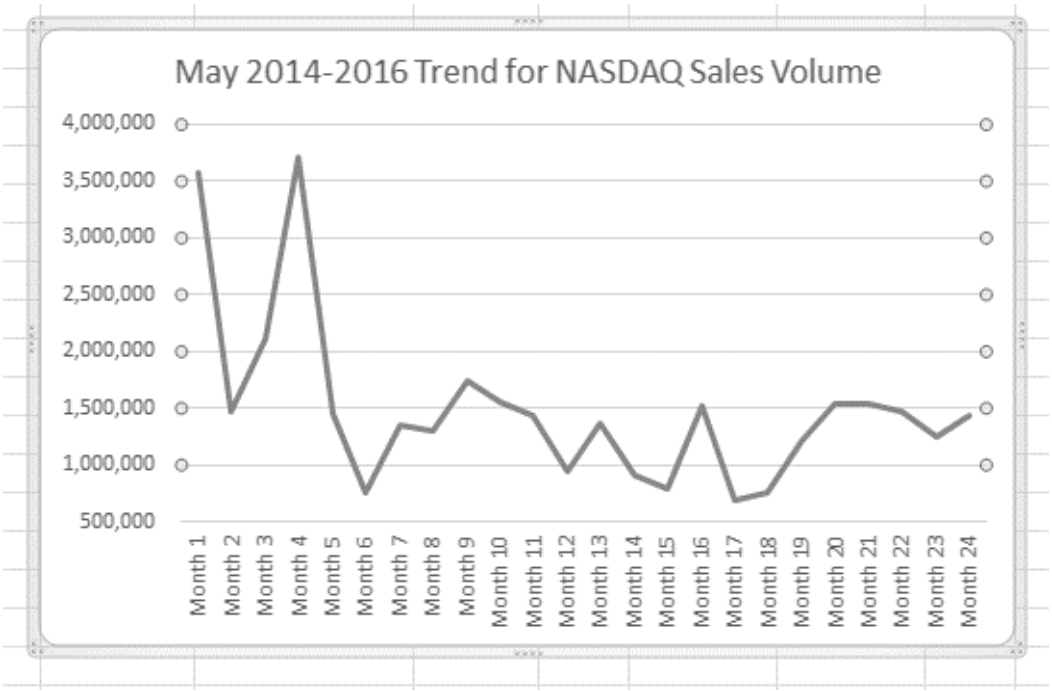


Figure 4.6 Adjusted Y-Axis for the S&P 500 Chart

Skill Refresher

Adjusting the Y-Axis Scale

1. Click anywhere along the **Y-axis** to activate it.
2. Right Click.
   (Note, you can also select the Format tab in the Chart Tools section of the ribbon.)
3. Select **Format Axis** . . .
4. In the **Format Axis pane**, make your changes to the **Axis Options**.
5. Click in the input box next to the desired axis option and then type the new scale value.
6. Click the **Close** button at the top right of the Format Axis pane to close it.

TREND COMPARISONS: LINE CHART 2

We will now create a second line chart using the data in the Stock Trend worksheet. The purpose of this chart is to compare two trends: the change in volume for the NASDAQ and the change in the Closing price.

Before creating the chart to compare the NASDAQ volume and sales price, it is important to review the data in the range B4:D28 on the Stock Trend worksheet. We cannot use the volume of sales and the closing price because the values are not comparable. That is, the closing price is in a range of $45.00 to $115.00, but the data for the volume of Sales is in a range of 684,000 to 3,711,000. If we used these values – without making changes to the chart — we would not be able to see the closing price at all.

The construction of this second line chart will be similar to the first line chart. The X axis will be the months in the range B4:D28.

1. Highlight the range **B4:D28** on the Stock Trend worksheet.
2. Click the **Insert** tab of the ribbon.
3. Click the **Line** button in the **Charts** group of commands.
4. Click the first option from the list, which is a basic line chart.

Figure 4.6.5 shows the appearance of the line chart comparing both the volume and the closing price before it is moved and resized. Notice that the line for the closing price (Close) appears as a straight line at the bottom of the chart.

Figure 4.6.5 Trend Comparison Line Chart

The line representing the closing values is flat along the bottom of the chart. This is hard to see and not very useful as is. Fear not. We will fix that.

1. Move the chart so the upper left corner is in the middle of cell M1.

2. Resize the chart, using the resizing handle so the graph is approximately in the area of M1:U13.

3. Click in the text box that says "**Chart Title**." Delete the text and replace it with the following: **24 Month Trend Comparison.**

4. Adjust the Closing Price axis, by double-clicking the red line across the bottom of the chart that represents the Closing Price.

5. The Format Data Series dialogue box opens. In the Series Options, select Secondary Axis.

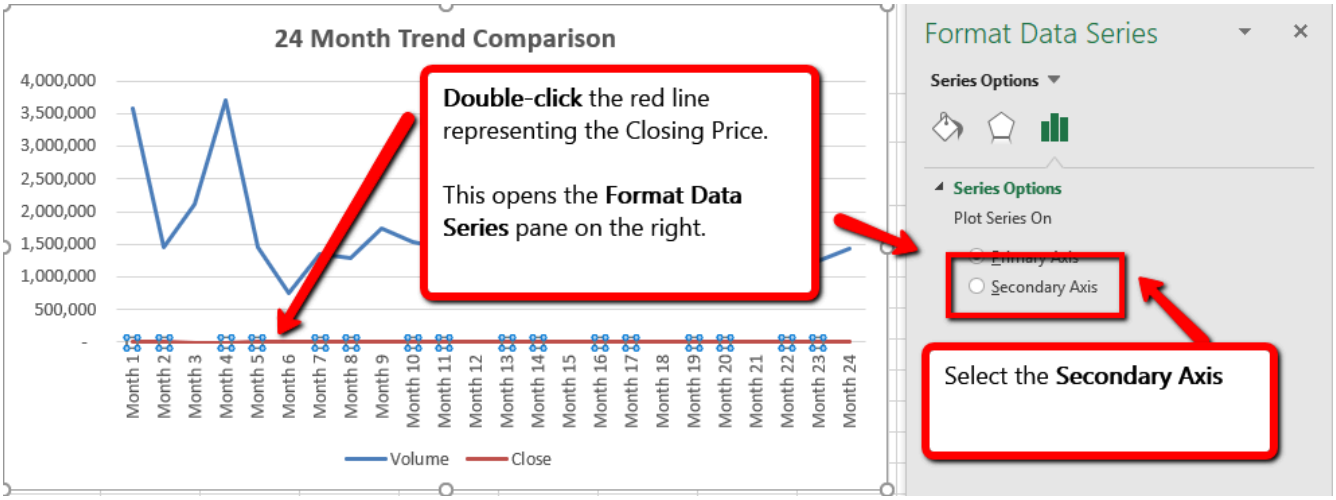
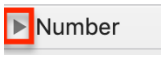


Figure 4.7 Adding a Secondary Axis

Excel adds the secondary axis. Format the values on the secondary axis to represent prices.

1. Double click the Secondary Vertical Axis. (The vertical axis on the right that goes from 0 to 140.)
2. In axis options, scroll down to the **Number** section.

   Mac Users: If needed, click the Number "expand arrow" 

3. Use the Symbol list box to add the $.
4. Press the Close button to close the Format Axis pane.
5. Save your work.

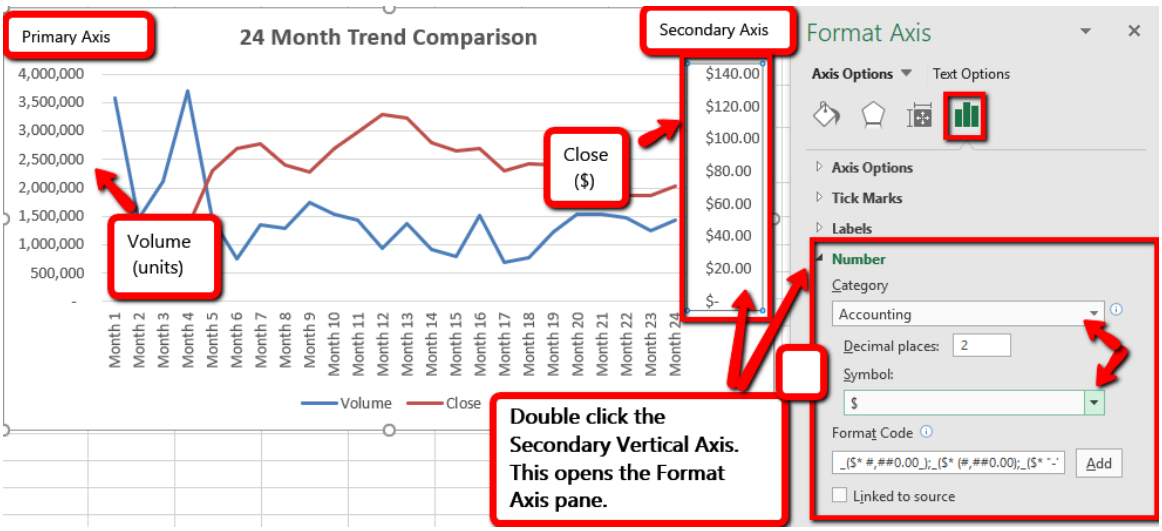


Figure 4.8 Modifying the Secondary Axis

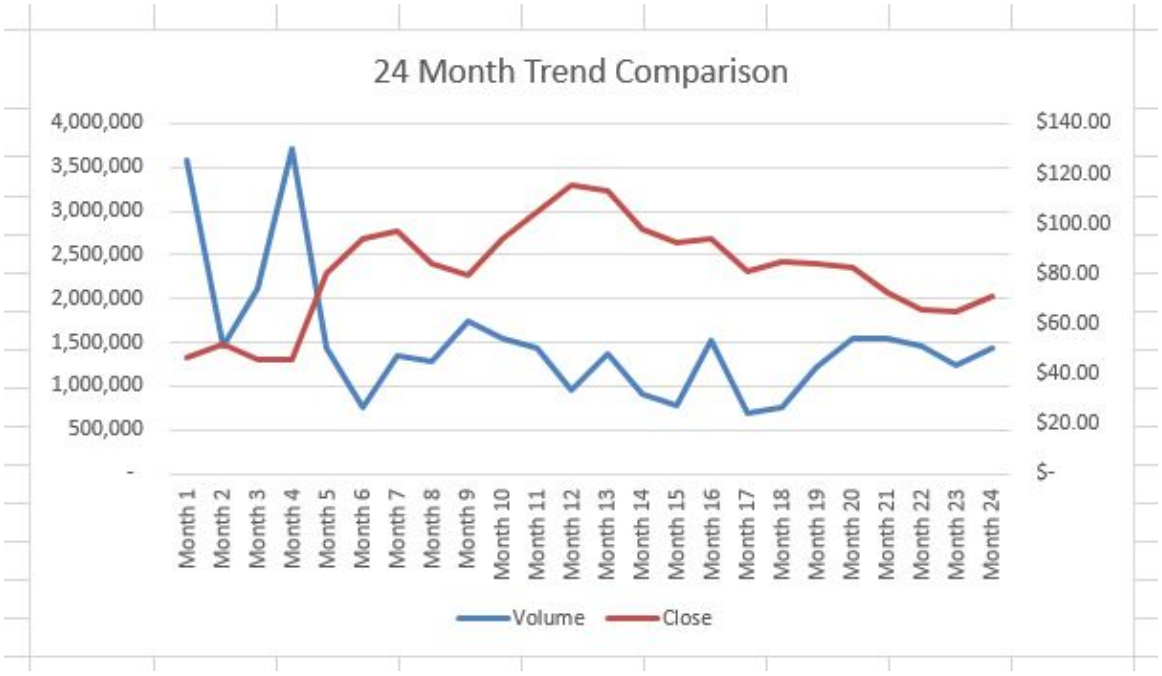


Figure 4.9 Final Comparison Line Chart

Skill Refresher

X and Y-Axis Number Formats

1. Double click anywhere along the X or Y axis to activate it.

2. Click Number from the list of options on the left side of the Format Axis dialog box.
3. Select a number format and set decimal places on the right side of the Format Axis dialog box.
4. Click the Close button in the Format Axis pane.

FREQUENCY DISTRIBUTION: COLUMN CHART 1

A column chart is commonly used to show trends over time, as long as the data are limited to approximately twenty points or less. A common use for column charts is frequency distributions. A frequency distribution shows the number of occurrences by established categories.

For example, a common frequency distribution used in most academic institutions is a grade distribution. A grade distribution shows the number of students that achieve each level of a typical grading scale (A, A−, B+, B, etc.). The Grade Distribution worksheet contains final grades for some hypothetical Excel classes.

To show the grade frequency distribution for all the Excel classes in that year, the **Numbers of Students** appear on the Y-axis and the **Grade Categories** appear on the X-axis. In this situation, notice we do not select the **Total** row. The totals are a representation of all data and would skew the graph. Essentially you would be graphing the information twice. If you want to display the totals in a chart, the best approach is to create a separate chart that only displays the total values.

The following steps to create the column chart:

1. Select the Grade Distribution worksheet.

2. In Row3, replace the red text at states **[Insert Current Year]** and replace it with the actual current academic term and year.

3. Select two non-adjacent columns by selecting **A3:A8**.

4. Press, and hold down the **Crtl key**.

   Mac Users: Hold down the **Command key** instead.

5. Without letting go of the **Ctrl key**, select **C3:C8**

6. From the ribbon click the **Insert** tab. Choose the **Column** button.

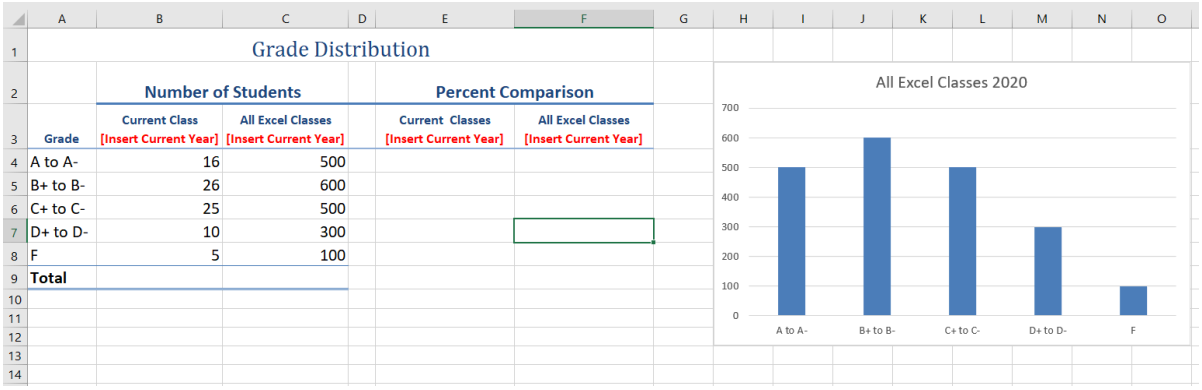
7. Select the **Clustered Column** format. (First option listed.)

8. Click and drag the chart so the upper left corner is in the middle of cell **H2**. Resize the graph to fit in the area of H2: O13.

9. Click any cell location on the **Grade Distribution** worksheet to deactivate the chart.

10. Save your work.

Figure 4.10 shows the completed grade frequency distribution chart. By looking at the chart, you can immediately see that the greatest number of students earned a final grade in the B+ to B– range.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Grade Distribution														
2		Number of Students			Percent Comparison										
3	Grade	Current Class [Insert Current Year]	All Excel Classes [Insert Current Year]		Current Classes [Insert Current Year]	All Excel Classes [Insert Current Year]									
4	A to A-	16	500												
5	B+ to B-	26	600												
6	C+ to C-	25	500												
7	D+ to D-	10	300												
8	F	5	100												
9	Total														
10															
11															
12															
13															
14															

Figure 4.10 Grade Frequency Distribution Chart

Why?

Column Chart vs. Bar Chart

When using charts to show frequency distributions, the difference between a column chart and a bar chart is really a matter of preference. Both are very effective in showing frequency distributions. However, if you are showing a trend over a period of time, a column chart is preferred over a bar chart. This is because a period of time is typically shown horizontally, with the oldest date on the far left and the newest date on the far right. Therefore, the descriptive categories for the chart would have to fall on the horizontal – or category axis, which is the configuration of a column chart. On a bar chart, the descriptive categories are displayed on the vertical axis.

CREATING A CHART SHEET

The charts we have created up to this point have been added, or embedded in, an existing worksheet. Charts can also be placed in a dedicated worksheet called a chart sheet. It is called a chart sheet because it can only contain an Excel chart. Chart sheets are useful if you need to create several charts using the data in a single worksheet. If you embed several charts in one worksheet, it can be cumbersome to navigate and browse through the charts. It is easier to browse through charts when they are moved to a chart sheet because a separate sheet tab is added to the workbook for each chart. The following steps explain how to move the grade frequency distribution chart to a dedicated chart sheet:

1. Click anywhere on the **Final Grades for All Excel Classes** chart on the Grade Distribution worksheet.
2. From the Chart Tools Design tab. Select **Move Chart .** This opens the Move Chart Dialog box.
3. Click the **New sheet** option on the Move Chart dialog box.
4. The entry in the input box for assigning a name to the chart sheet tab should automatically be highlighted once you click the New sheet option. Type **All Excel Classes.** This replaces the generic name in the input box (see **Figure 4.11**).
5. Click the **OK** button at the bottom of the Move Chart dialog box. This adds a new chart sheet to the workbook with the name **All Excel Classes**.
6. Save your work.

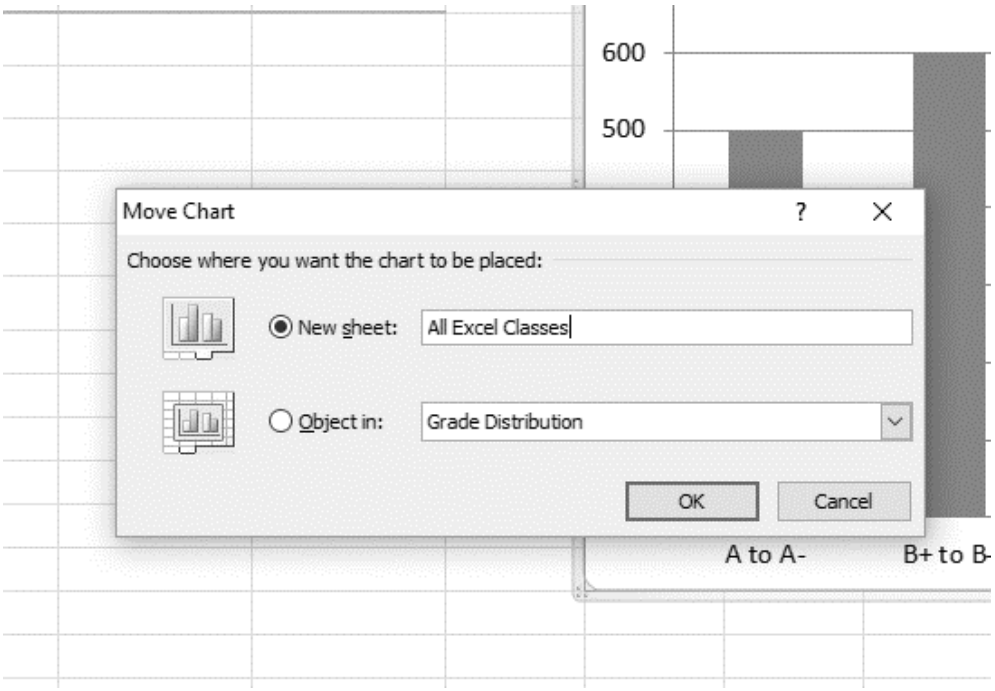


Figure 4.11 Move Chart

Figure 4.12 shows the Final Grades for all the Excel Classes column chart is in a separate chart sheet. Notice the new worksheet tab added to the workbook matches the New sheet name entered into the Move Chart dialog box. Since the chart is moved to a separate chart sheet, it no longer is displayed in the Grade Distribution worksheet.

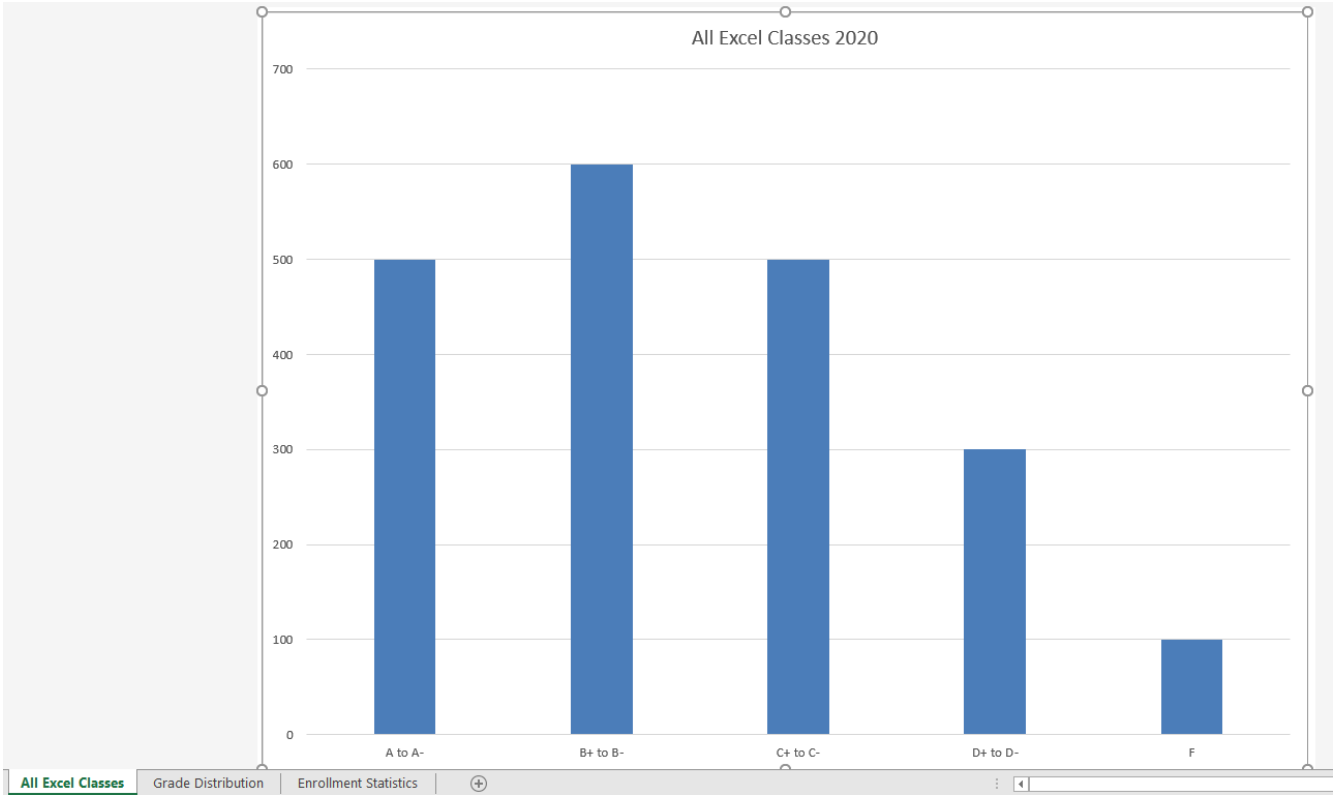


Figure 4.12 Chart Sheet Added to the Workbook

FREQUENCY COMPARISON: COLUMN CHART 2

We will create a second column chart to show a comparison between two frequency distributions. Column B on the Grade Distribution worksheet contains data showing the number of students who received grades within each category for the Current Excel Class Class. We will use a column chart to compare the grade distribution for the current class (Column B) with the overall grade distribution for Excel courses for the whole year (Column C).

However, since the number of students in the term is significantly different from the total number of students in the year, we must calculate percentages in order to make an effective comparison. The following steps explain how to calculate the percentages:

1. Highlight the range **B4:C9** on the **Grade Distribution** worksheet.

2. Click the **AutoSum** button in the Editing group of commands on the Home tab of the ribbon. This automatically sums the values in the selected range.

3. Select cell **E4**. Enter a formula that divides the value in cell **B4** by the total in cell **B9**. Add an absolute reference to cell **B9** in the formula **=B4/$B$9**. Autofill the formula down to cell **E8.**

4. Select cell **F4** . Enter a formula that divides the value in cell **C4** by the total in cell **C9**. Add an absolute reference to cell **C9** in the formula **=C4/$C$9**.

5. Autofill the down to **F8**.

6. Select **A3:A8,** press and hold down the **Ctrl** key and select **E3:F8.**

   Mac Users: Hold down the **Command key**

7. Click the **Insert** tab of the ribbon.

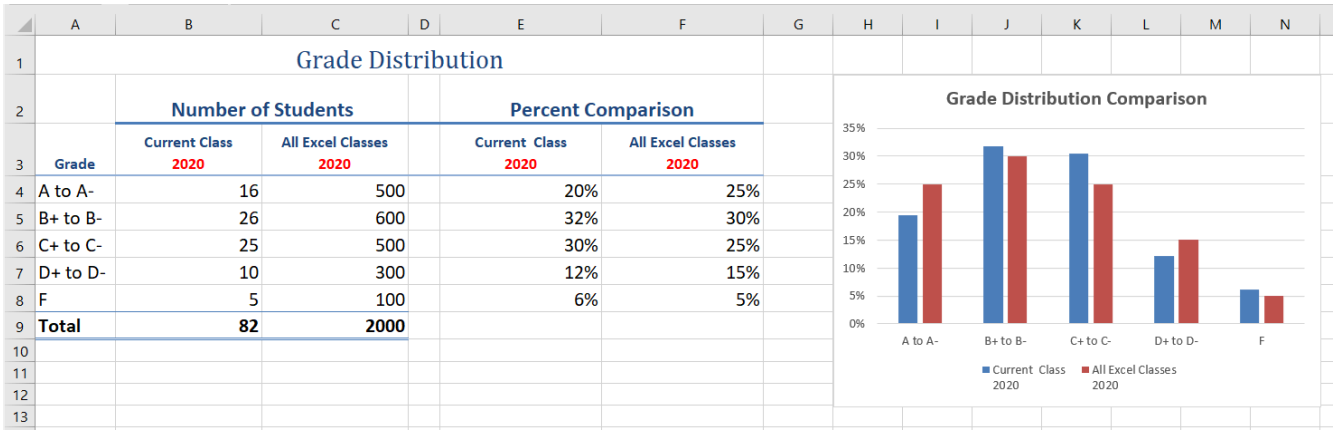
8. Select the **Column** button. Select the first option from the drop-down list of chart formats, which is the **Clustered Column**.

9. Click and drag the chart so the upper left corner is in the middle of cell **H2**.

10. Resize the chart to the approximate area of H2:N12.

11. Change the chart title to **Grade Distribution Comparison**. If you do not have a chart title, you can add one. On the **Design** tab, select **Add Chart Element**. Find the **Chart Title**. Select the **Above Chart** option from the drop-down list.

12. Save your work.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Grade Distribution													
2		Number of Students			Percent Comparison									
3	Grade	Current Class 2020	All Excel Classes 2020		Current Class 2020	All Excel Classes 2020								
4	A to A-	16	500		20%	25%								
5	B+ to B-	26	600		32%	30%								
6	C+ to C-	25	500		30%	25%								
7	D+ to D-	10	300		12%	15%								
8	F	5	100		6%	5%								
9	Total	82	2000											
10														
11														
12														
13														

Figure 4.13 Completed Data Series for the Class Grade Distribution

Figure 4.13 shows the final appearance of the column chart. The column chart is an appropriate

type for this data as there are fewer than twenty data points and we can easily see the comparison for each category. An audience can quickly see that the class issued fewer As compared to the college. However, the class had more Bs and Cs compared with the college population.

Integrity Check

Too Many Bars on a Column Chart?
Although there is no specific limit for the number of bars you should use on a column chart, a general rule of thumb is twenty bars or less.

MAP CHARTS

Data visualization brings more depth in how information, in this case geographically, connects. You can use a map chart to compare values and show categories across geographical regions like countries/regions, states, counties or postal codes. Excel will automatically convert data to geographical locations and will display values on a map. As shown below, in **Figure 4.14,** in the next steps we will compare West Coast Community College enrollments for Fall of 2019 using a map chart.

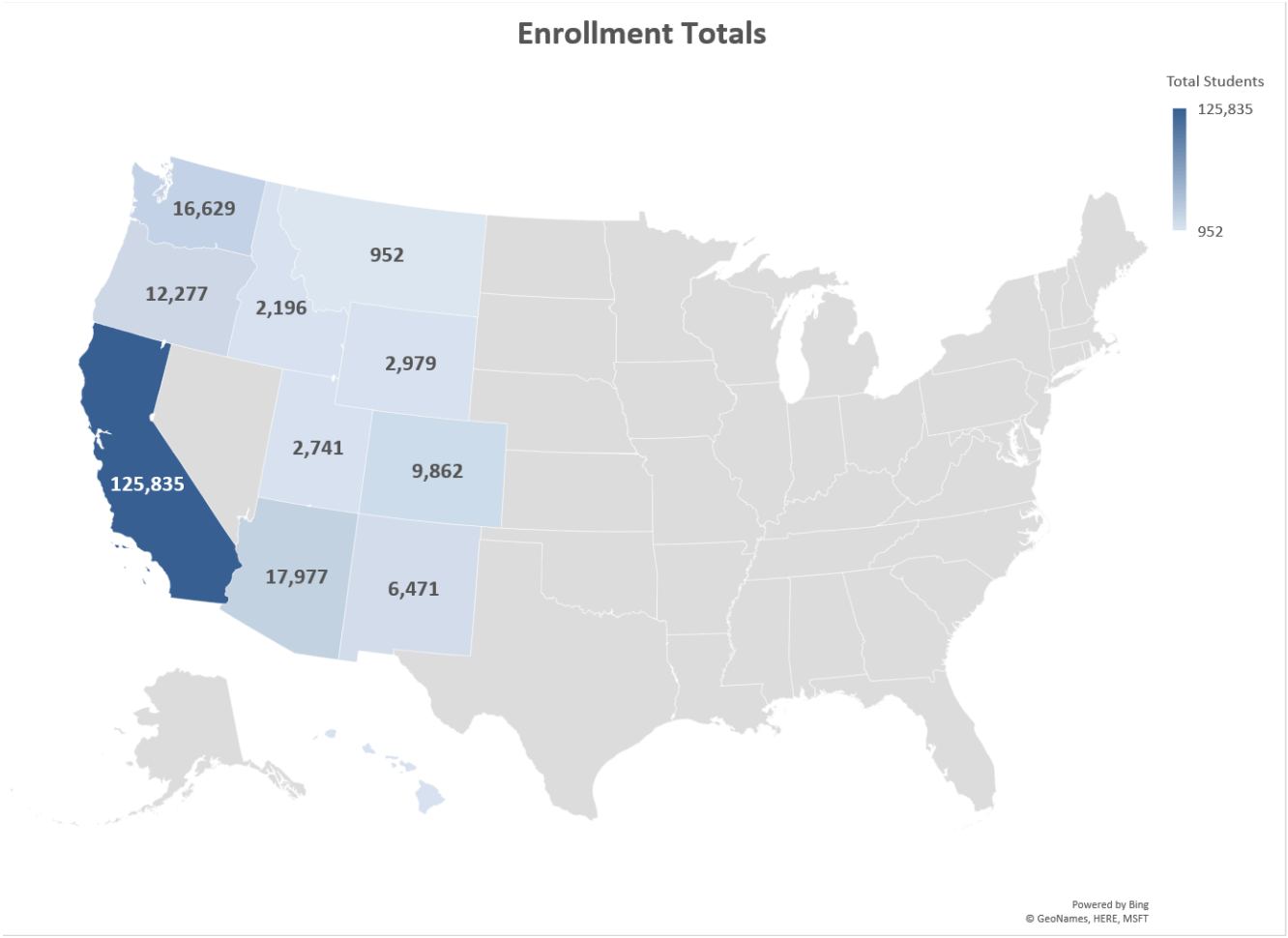


Figure 4.14 Map Chart Solution

1. From the **Enrollment Statistics** worksheet, select **A3:A13.** Next, press and hold the **CTRL** key and select **C3:C13**.
2. Click the Insert tab on the Ribbon.
3. Click **Maps**, and choose the **Filled Map** option.
4. From the Charts Design Tab, choose **Move Chart**, and select the **New Sheet** option. In the name box type **Map**. Click **Ok**.
5. To make sure the map and data are vibrant and will stand out in a presentation make the following changes:

a) Select the **Title.** Type **Enrollment Totals.** Change the font to **bold**, **size 18**.

b) From the top right corner of the Chart area, choose the Charts Elements plus sign.

c) Select the Data Labels checkbox. Notice the values appear on each State.

Mac Users: there is no "Charts Element plus sign". Follow the alternate steps below.

Click the **"Chart Design"** tab on the Ribbon
Click the **"Add Chart Element"** button on the Ribbon
Point to **"Data Labels"** option and click **"Show"**

d) Save your work.

FUNNEL CHARTS

Another graph to visualize data is a Funnel chart. Funnel charts provide a visual snapshot of a process. From our data, we will create a Funnel Chart to show how many students we have in the admissions process. You can quickly review the funnel chart to see admissions predicts to have 932 new enrolled students for Winter Term 2020.

Insert a Funnel chart by following the below steps.

1. From the **Admissions** sheet, select **A3:B7**.
2. From the Insert tab, choose **Recommended Charts**.
3. Scroll down the list and select the **Funnel Chart**. Click **OK**.
4. Move and resize the graph to approximately fit in the range of **D1:K15.**
5. From the Design Tab, click the **6th style option** provided in the styles gallery. (The background is black.) It is okay if your text color is different than the figure below.
6. Change the Chart Title to **Admissions Pipeline Winter 2020.**
7. From the Charts Elements, turn off the **Legend**.
   Mac Users: Click the "**Add Chart Element**" button and change the "**Legend**" option to "**None**"
8. Save your work.

	A	B
1	**Admissions Pipeline**	
2	**Winter Term 2020**	
3	Prospects	5,500
4	Inquires	3,300
5	Applications	1,890
6	Admissions	1,522
7	Enrolled	932

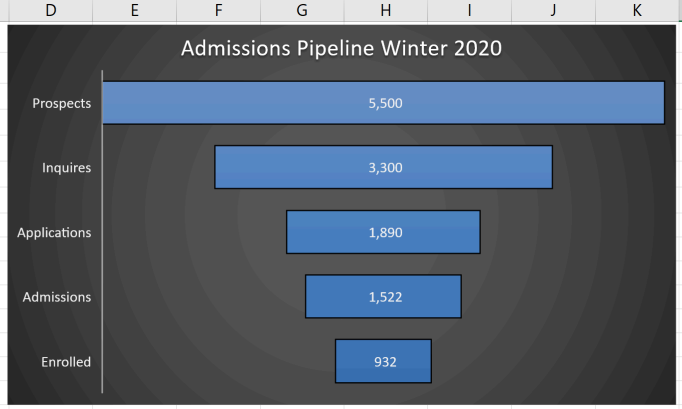


Figure 4.15 Funnel Chart

PERCENT OF TOTAL: DOUGHNUT PIE CHART

The next chart we will demonstrate is a pie chart. A pie chart is used to show a percent of the total for a data set at a specific point in time. Using the Doughnut Pie Chart, show the percentage of students enrolled at a full-time status. As in the last example, the data is located on the Enrollment Statistics sheet.

1. From the **Enrollment Statistics** worksheet, select **A3:A13.** Next, press and hold the **CTRL** key and select **D3:D13**.
2. Click the **Insert** tab on the ribbon.
3. Click the **Pie** button in the **Charts** group of commands.
4. Select the "**Doughnut**" option from the drop-down list of options.
5. From the Charts Design Tab, choose Move Chart, and select the New Sheet option. In the name box type **Full-Time Students**. Click **Ok**.
6. From the Chart Tools Design Tab, click the Chart Styles gallery and apply **Style 7**.
7. On the Chart, expand the Charts Elements tools. Select the **Legend** Choose to display the legend on the **Right**.

   Mac Users: Click "Add Chart Element" button, point to **Legend** and choose **"Right"**
8. From the Charts Elements, select the Data Labels checkbox. Then, drop down the Data Labels menu. Choose, **More Options**.

   Mac Users: Click "Add Chart Element" button, point to **Data Labels** and choose **"More Data Label Options"**

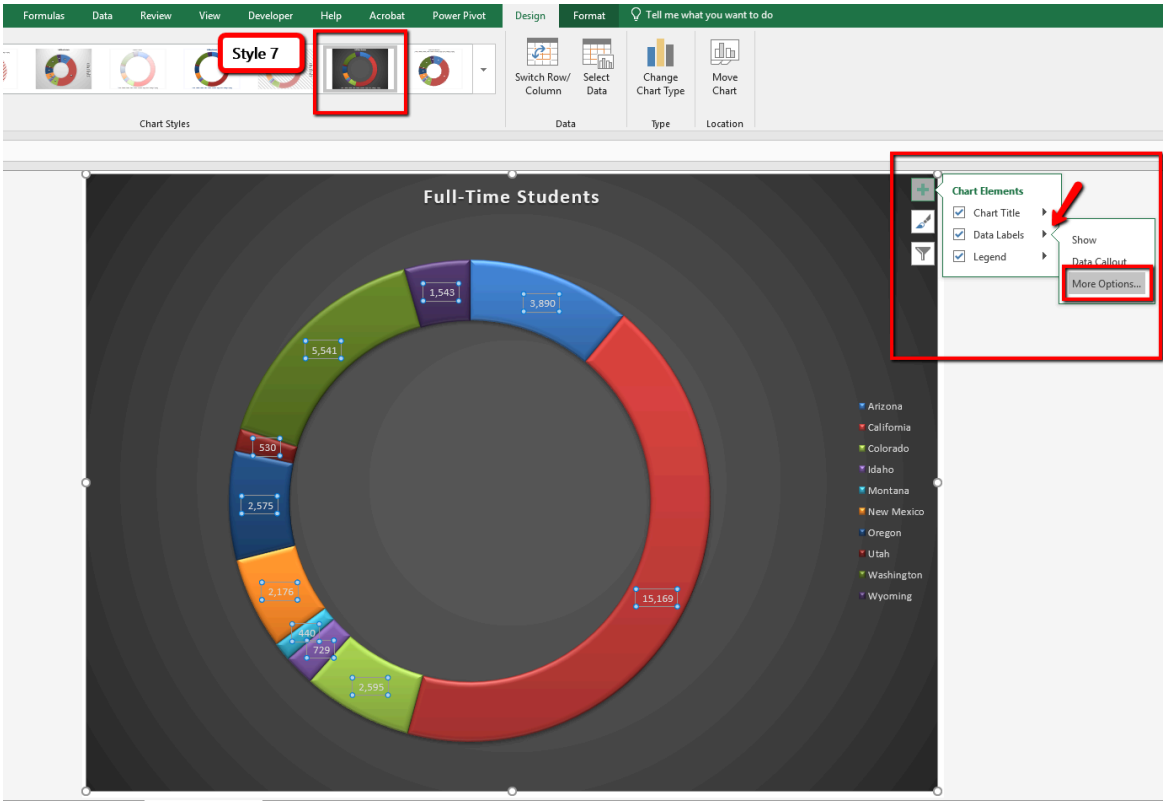


Figure 4.15 Doughnut Pie Chart Elements

9. From the Format Data Label Options menu, select **Percentages**, and **Deselect Values** to show the percent of total students that are enrolled at a full-time status.

10. Close the Format Data Labels menu.

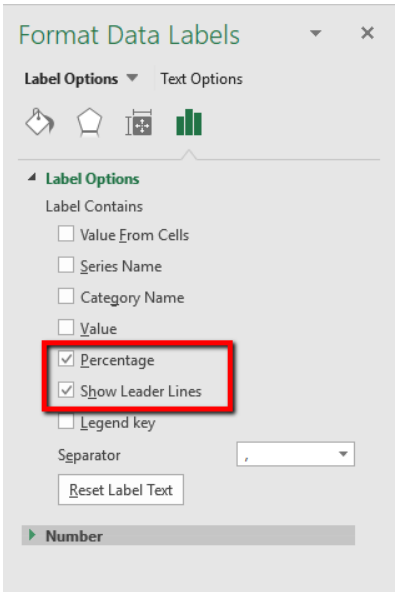


Figure 4.16 Doughnut Pie Format Data Labels

Notice the font is small compared to the graph size. Adjust the font size of the Title, Legend, and Data Label by following the below steps:

1. Select the Title. Change the font to **bold**, **size 18**.
2. Select the Legend. Change the font to **bold, size 14.**
3. Select one of the data labels in a doughnut wedge. Notice now all labels are selected. Change the font **bold, size 12.**

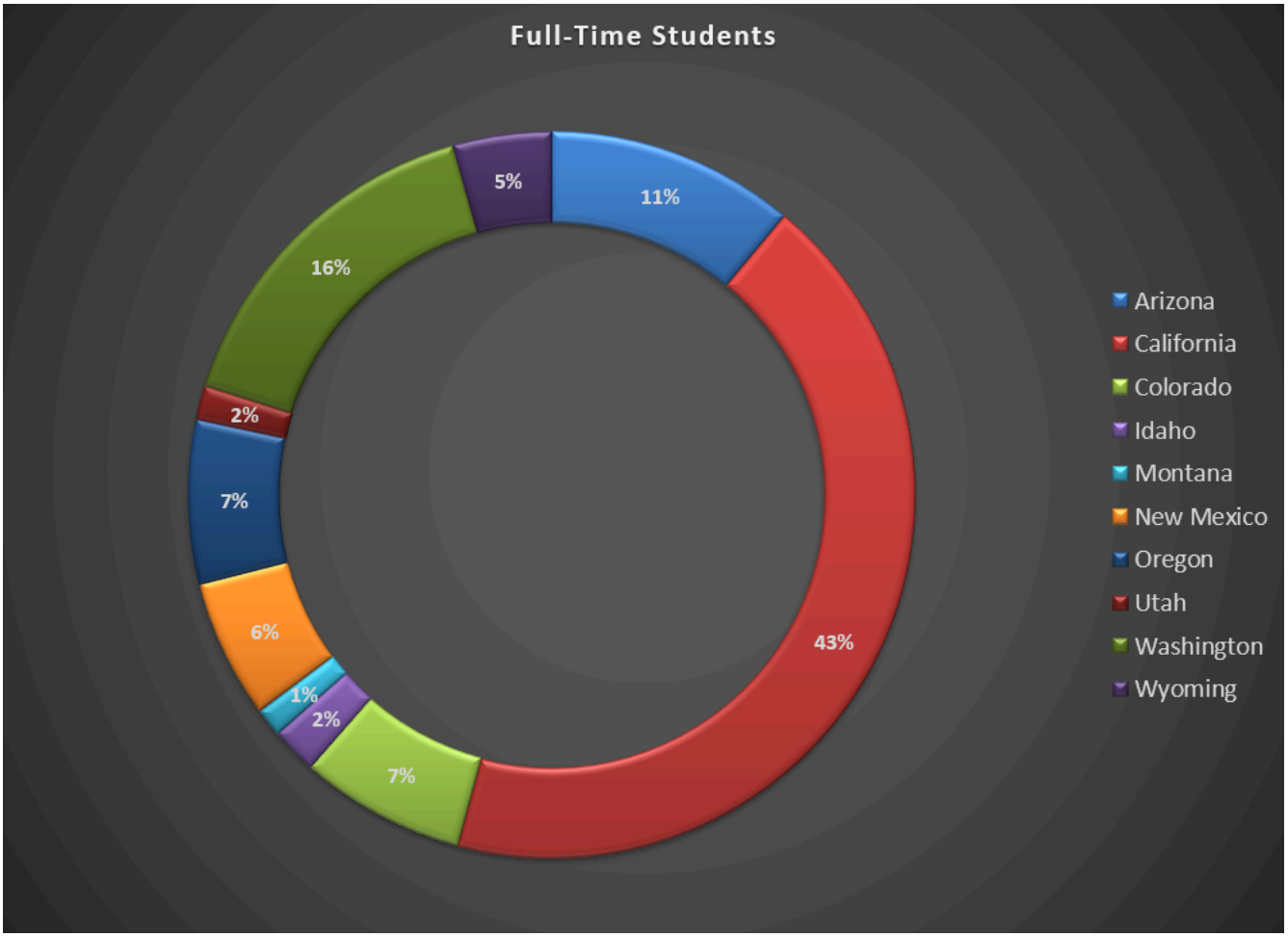


Figure 4.18 Doughnut Pie Solution

Skill Refresher

Inserting a Pie Chart

1. Highlight a range of cells that contain the data you will use to create the chart.
2. Click the Insert tab of the ribbon.
3. Click the Pie button in the Charts group.
4. Select a format option from the Pie Chart drop-down menu.

BAR CHART VS COLUMN CHART

We will statistical data to compare a bar and column chart. Both the Bar and the Column chart display data using rectangular bars where the length of the bar is proportional to the data value. Both

charts are used to compare two or more values. However, the difference lies in their orientation. A bar chart is oriented horizontally whereas the column chart is oriented vertically. Although alike, they cannot be always used interchangeably. The difference in their orientation, meaning typically the more data values the harder it is to read in a column format. This is where visually a bar chart would be a better choice. Complete the below steps to insert both a bar and column chart comparing not only the gender and age differences of enrolled students but the type of graphs you are viewing the data in.

1. From the Enrollment Statistics sheet, select **A3:A13**. Press and hold the CTRL key and select **G3:H13**.
2. From the Insert tab, choose **Recommended Charts**. Scroll down and select the **Stacked Bar** chart option. Click **Ok**.
3. Move and resize the graph so it fits approximately in **L1:U13**.
4. Add a chart title. Type **Age Comparison**.
5. Notice the age difference. Currently, per State, the majority of students are under 20 years old. **Save your work**.

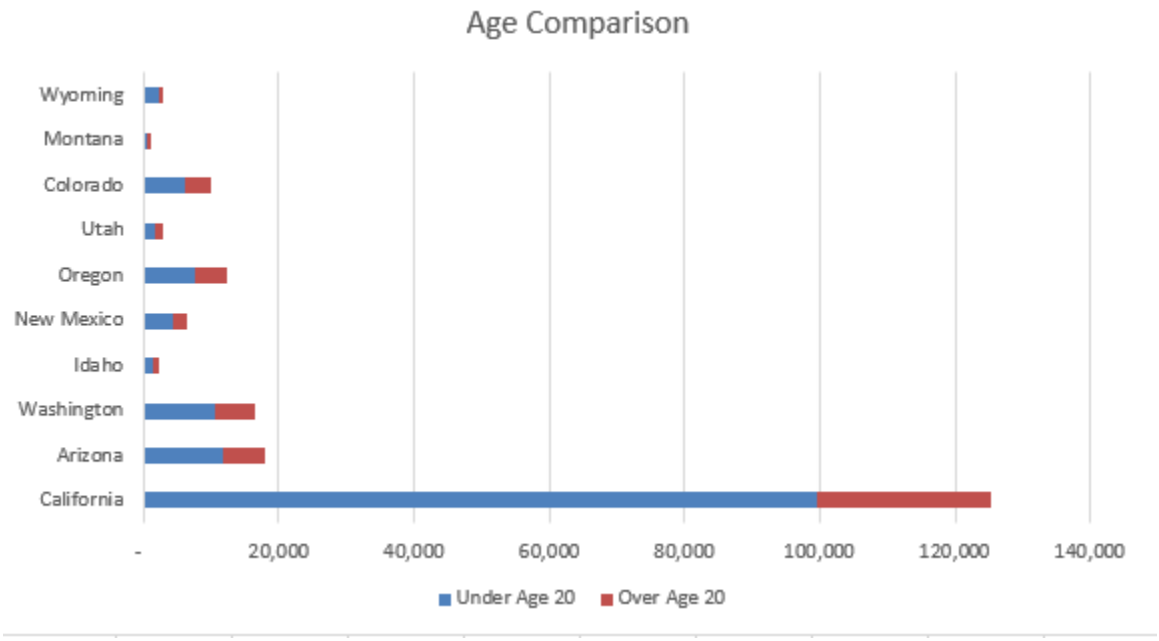


Figure 4.19 Stacked Bar chart solutions

Next, insert a column chart comparing gender.

1. From the Enrollment Statistics sheet, select **A3:A13**. Press and hold the CTRL key and select I**3:J13**.
2. From the Insert tab, choose **Recommended Charts**. Choose the first option, Clustered Column chart.

3. Move and resize the graph so it fits approximately in **L15:U32**.
4. Add a chart title. Type **Gender Comparison**.
5. Notice the ratio of women and men enrolled are pretty equal per State. **Save your work**.

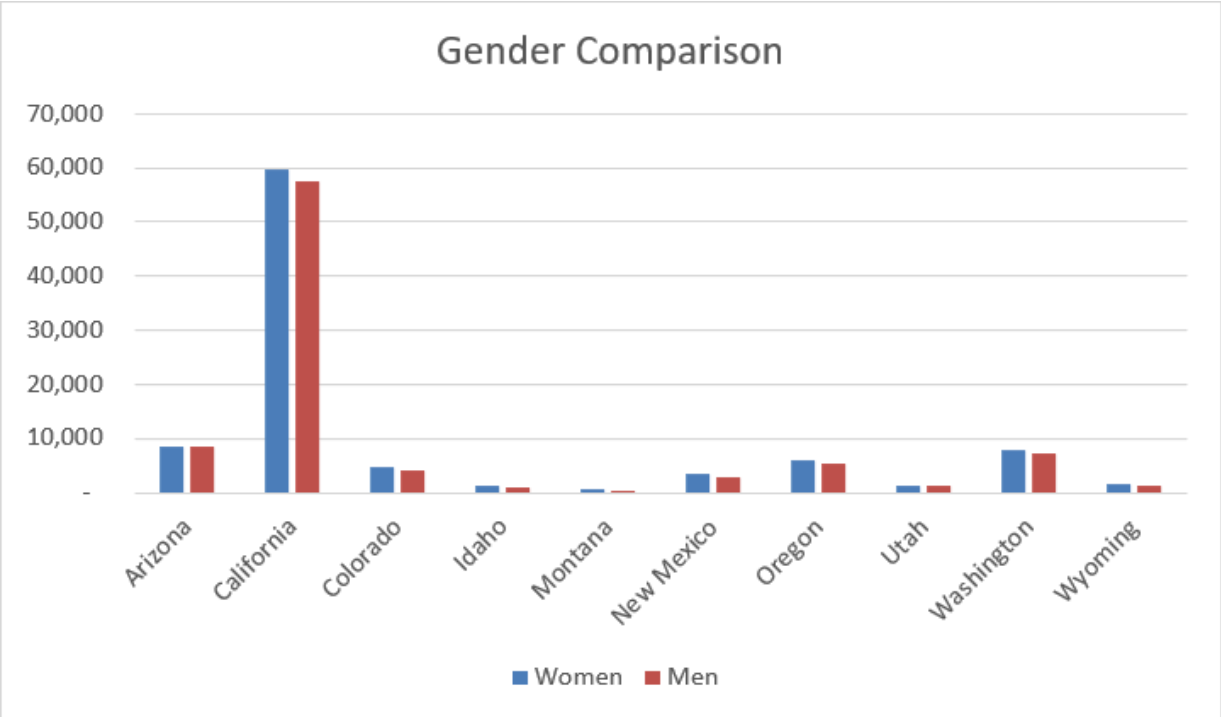


Figure 4.20 Column Chart Age Comparison

STACKED COLUMN CHART

The last chart types we will demonstrate is the stacked column chart and a bar chart. You will use a stacked column chart to show differences in budgeted expense accounts for the admissions department and a bar chart for age comparisons of enrolled students at the college.

Follow the below steps to insert a stacked column chart.

1. Click the Expenses sheet. Select the range **A4:G9.**
2. Click the **Insert** tab of the ribbon.
3. Click the **Column** button in the **Charts** group of commands. Select the **3D– Stacked Column** format.
4. Change the Chart Title to **Expenses**.
5. Move the Chart to a New Sheet. In the name box type Budget.

6. Save your work.

Figure 4.21 shows the final stacked column chart.

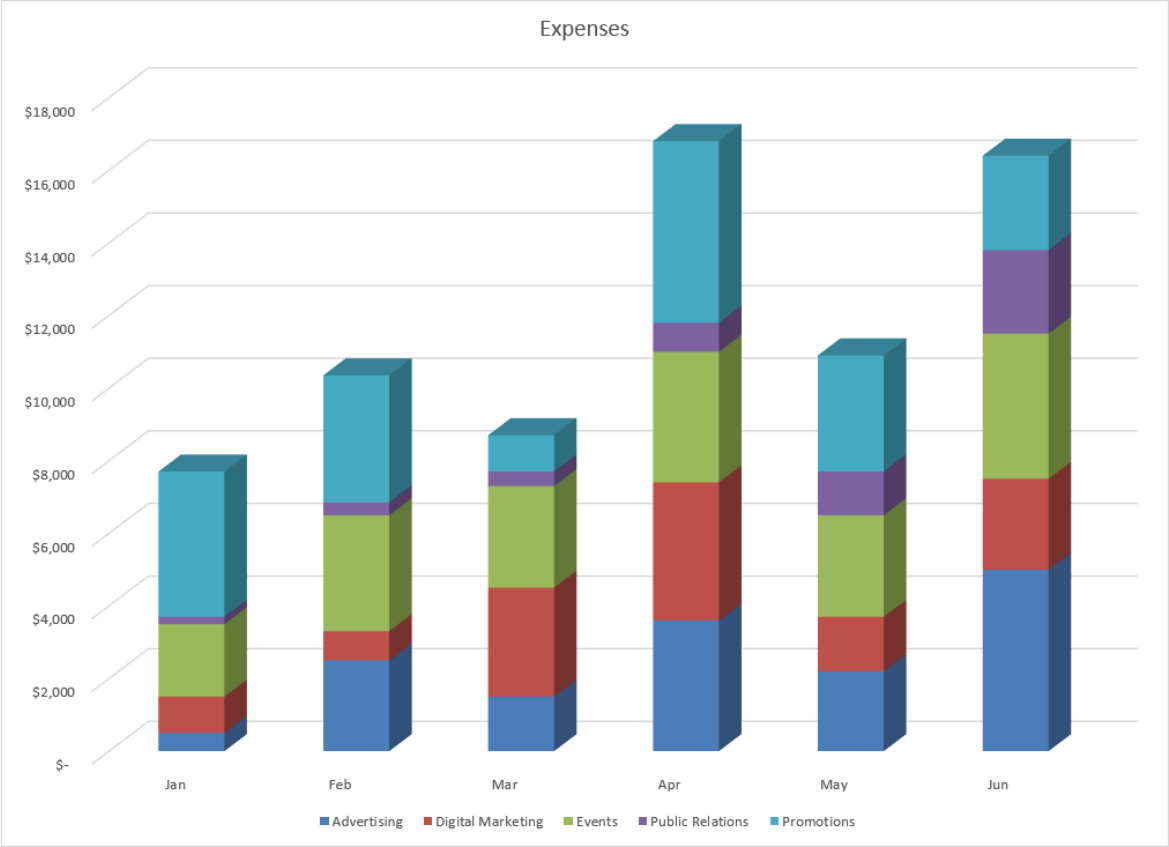


Figure 4.21 Stacked Column Chart

Skill Refresher:

Inserting a Stacked Column Chart

1. Highlight a range of cells that contain data that will be used to create the chart.
2. Click the Insert tab of the ribbon.
3. Click the Column button in the Charts group.
4. Select the Stacked Column format option from the Column Chart drop-down menu to show the values of each category on the Y-axis. Select the Stacked Column option to show each category on the Y-axis.

Key Takeaways

- Identifying the message you wish to convey to an audience is a critical first step in creating an Excel chart.
- Both a column chart and a line chart can be used to present a trend over a period of time. However, a line chart is preferred over a column chart when presenting data over long periods of time.
- The number of bars on a column chart should be limited to approximately twenty bars or less.
- When creating a chart to compare trends, the values for each data series must be within a reasonable range. If there is a wide variance between the values in the two data series (two times or more), the percent change should be calculated with respect to the first data point for each series.
- When working with frequency distributions, the use of a column chart or a bar chart is a matter of preference. However, a column chart is preferred when working with a trend over a period of time.
- A pie chart is used to present the percent of total for a data set.
- A stacked column chart is used to show how a percent total changes over time.

ATTRIBUTION

4.2 Formatting Charts

Learning Objectives

1. Apply formatting commands to the X and Y axes.
2. Assign titles to the X and Y axes that clarify labels and numeric values for the reader.
3. Apply labels and formatting techniques to the data series in the plot area of a chart.
4. Apply formatting commands to the chart area and the plot area of a chart.

You can use a variety of formatting techniques to enhance the appearance of a chart once you have created it. Formatting commands are applied to a chart for the same reason they are applied to a worksheet: they make the chart easier to read. However, formatting techniques also help you qualify and explain the data in a chart. For example, you can add footnotes explaining the data source as well as notes that clarify the type of numbers being presented (i.e., if the numbers in a chart are truncated, you can state whether they are in thousands, millions, etc.). These notes are also helpful in answering questions if you are using charts in a live presentation.

X AND Y-AXIS FORMATS

There are numerous formatting commands we can apply to the X and Y axes of a chart. Although adjusting the font size, style, and color are common, many more options are available through the Format Axis pane. The following steps demonstrate a few of these formatting techniques on the **Grade Distribution Comparison** chart. Follow the below steps to make some changes to the percentage numbers on the Y (vertical) axis.

1. In the **Grade Distribution** worksheet, click on the **Grade Distribution Comparison** chart. Double-click the vertical (value) axis. This opens the **Format Axis** pane.
2. Select **Axis Options**. Change the **Minimum Bound** to **.05** to make the differences in the columns more dramatic.
3. Click the **Close** button at the top of the Format Axis pane.
4. Save your work.

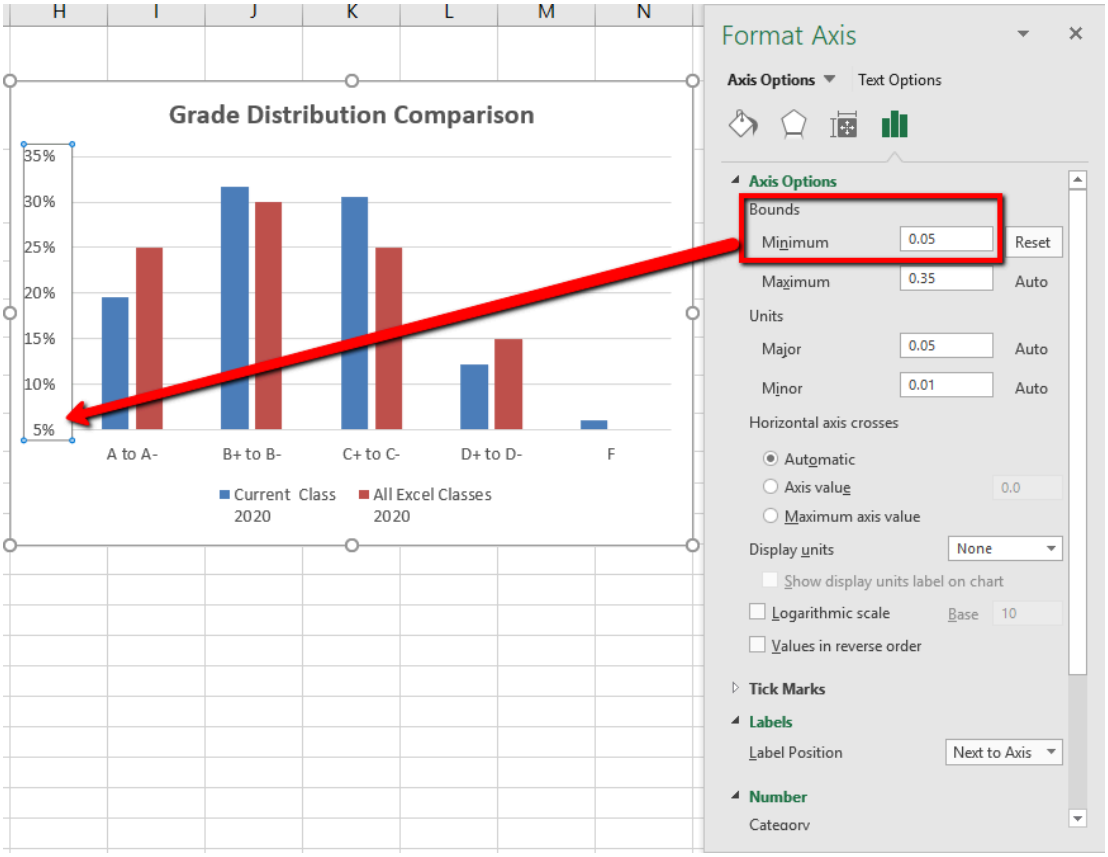


Figure 4.22 Format Axis Pane Changes

X AND Y-AXIS TITLES

Titles for the X and Y axes are necessary for defining the numbers and categories presented on a chart. For example, by looking at the Grade Distribution Comparison chart, it is not clear what the percentages along the Y-axis represent. The following steps explain how to add titles to the X and Y axes to define these numbers and categories:

1. Click anywhere on the Grade Distribution Comparison chart in the Grade Distribution worksheet to activate it.
2. In the upper right corner of the graph, choose the Charts Element plus sign. Select the Axis Titles, then Primary Horizontal and Primary Vertical. This inserts the place holders that you will type text in.

   Mac Users click the "Add Chart Element" button in the Design tab, point to "Axis Titles" and click on "Primary Horizontal". Do this one more time and click on "Primary Vertical".
3. Click at the beginning of the Y-axis title and delete the generic title. Type **Percent of Enrolled Excel Students**.

4. Click at the beginning of the X-axis title and delete the generic title. Type **Final Course Grade**.

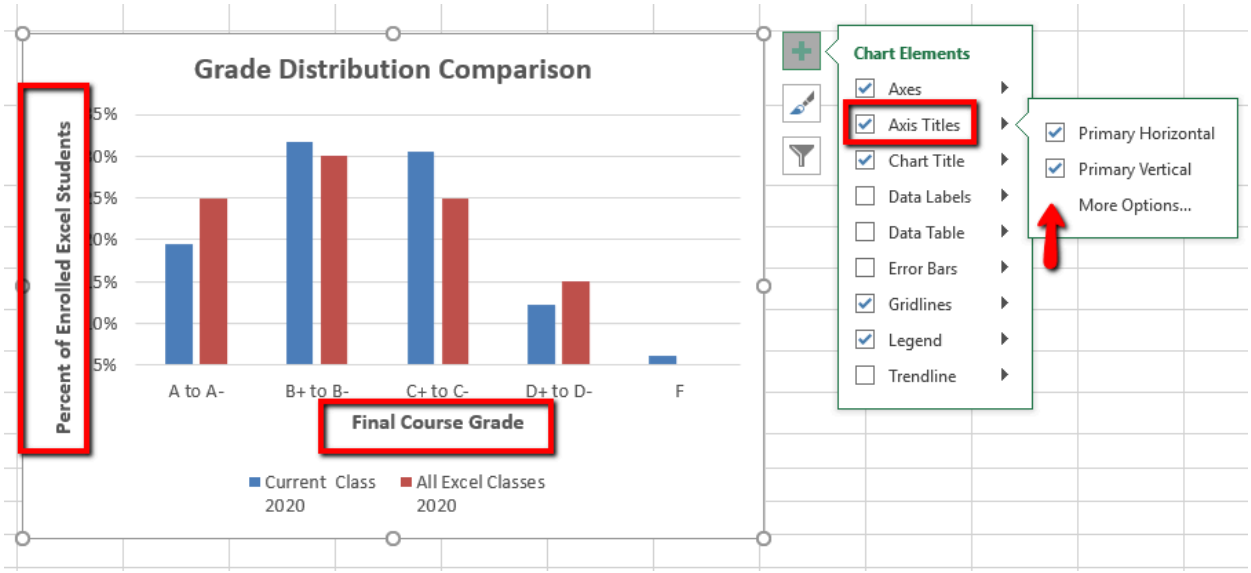


Figure 4.23 Selecting a Title for the X & Y-Axis

Skill Refresher

X and Y Axis Titles

1. Click anywhere on the chart to activate it. Choose to open the Charts Element menu.
2. Select one of the options from the second drop-down list.
3. Click in the axis title to remove the generic title and type a new title.

DATA SERIES LABELS AND FORMATS

Adding labels to the data series of a chart is a key formatting feature. A data series is an item that is being displayed graphically on a chart. For example, the blue bars on the Grade Distribution Comparison chart represent one data series. We can add labels at the end of each bar to show the exact percentage the bar represents. In addition, we can add other formatting enhancements to the data series, such as changing the color of the bars or adding an effect. The following steps explain how to add these labels and formats to the chart:

1. Click on any of the **red columns** representing the **All Excel Classes** data series, then **Right-Click** to open the menu.

Mac Users should hold down the **CTRL key** and click on any of the red columns.

2. From the menu, select **Format Data Series.**
3. From the **Format Data Series** pane, click the **Fill and Line** (paint bucket) button to bring up the Fill and Border group of commands.
4. Click the word **Fill** (if needed) to expand the list of Fill options.
5. Select **Pattern Fill**. Then select **40%** (last option in the top row). Change the Foreground to white, and the Background to Red.
6. Close the **Format Data Series** pane.

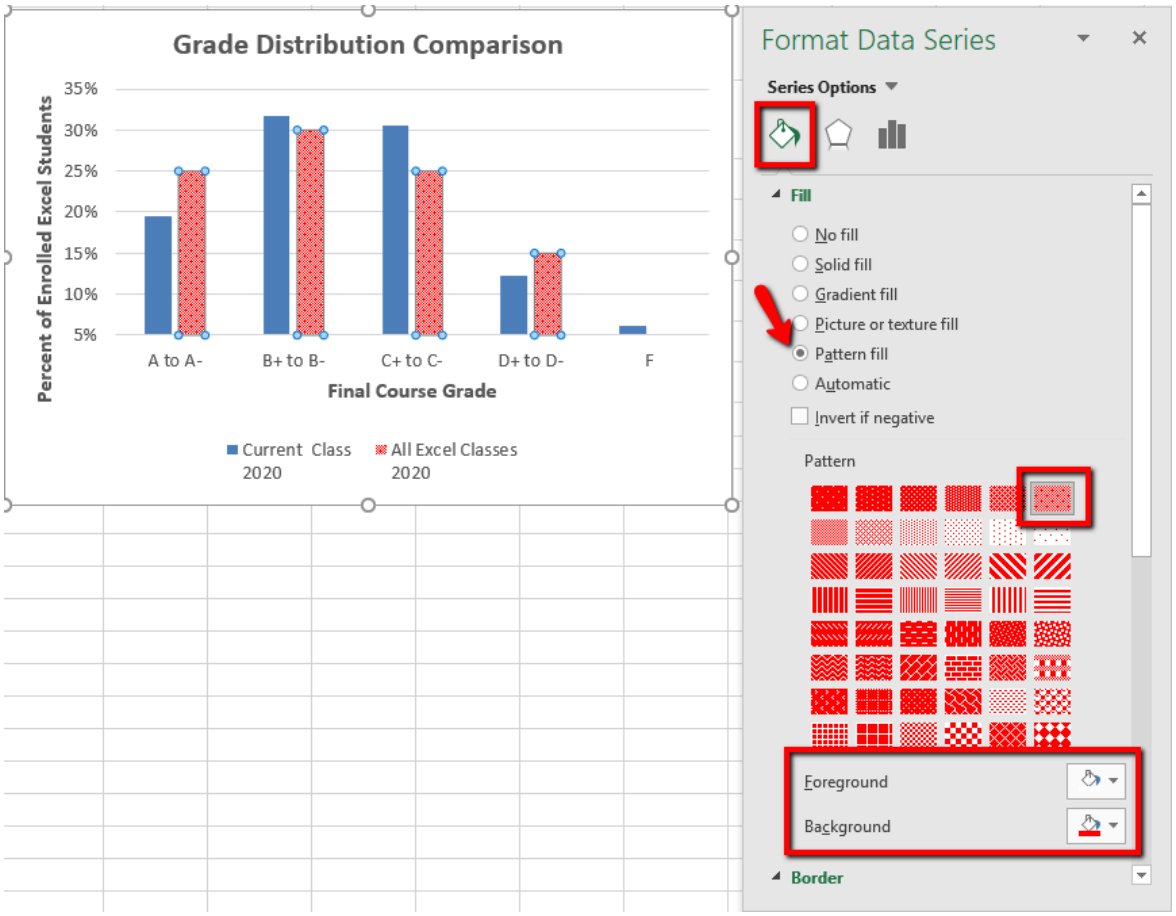


Figure 4.24 Changing the Fill of a Data Series

Now we are going to add the Data Labels at the end of the columns.

1. Be sure that your entire chart is selected, not just one of the data series. Click the **Design** tab in the **Chart Tools** section of the ribbon.
2. On the **Design** tab select the **Add Chart Element** button, then **Data Labels**, then **Out-**

side End (see **Figure 4.25**.)

3. Click on one of the **Data Labels**. Note that all of the data labels for that data series are selected.
4. Check the spelling on all of the worksheets and make any necessary changes. Save your work.

Figure 4.25 shows the Grade Distribution Comparison chart with the completed formatting adjustments and labels added to the data series. Note that we can move each individual data label. This might be necessary if two data labels overlap or if a data label falls in the middle of a grid line. To move an individual data label, click it twice, then click and drag.

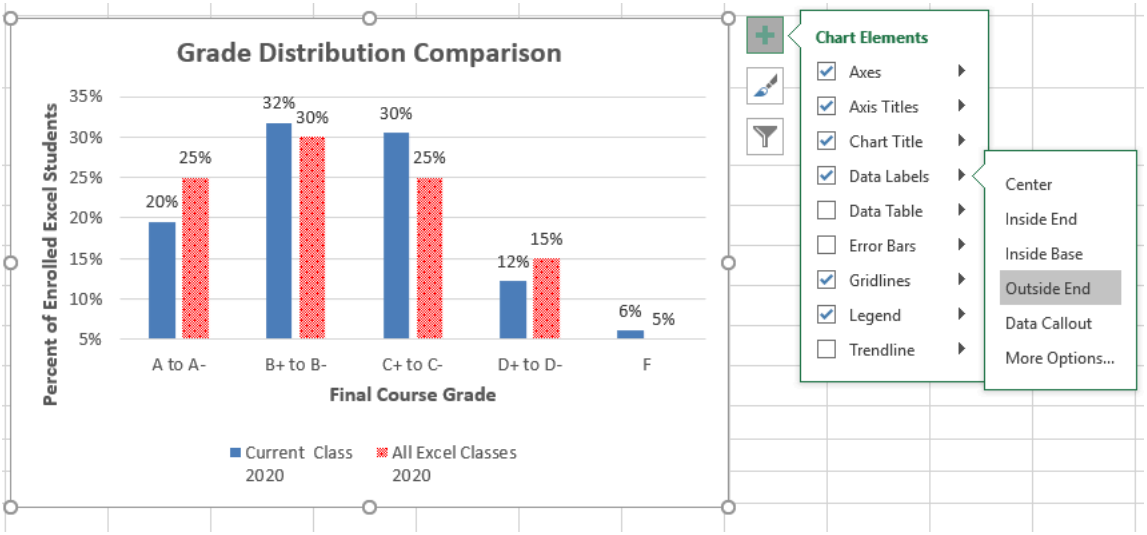


Figure 4.25 Data Labels Outside End

Skill Refresher:

Adding Data Labels

1. Click anywhere on the chart to activate it.
2. Open the **Add Chart Element** group.
3. Then, select **Data Labels**
4. Select one of the preset positions from the drop-down list.

Key Takeaways

- Applying appropriate formatting techniques is critical for making a chart easier to read.
- Many formatting commands in the Home tab of the ribbon can be applied to a chart.
- To change the number format for an axis or data label, you must use the Number section in the Format Data Labels dialog box. You cannot use the Number format commands in the Home tab of the ribbon.
- Axis titles help the reader sees the most accurate representation of the information presented on a chart.

ATTRIBUTION

4.3 Using Charts with Microsoft® Word® and Microsoft® PowerPoint®

Learning Objectives

1. Learn how to paste an image of an Excel chart into a Word document.
2. Learn how to paste a link to an Excel chart into a PowerPoint slide.

Charts that are created in Excel are commonly used in Microsoft Word documents or for presentations that use Microsoft PowerPoint slides. Excel provides options for pasting an image of a chart into either a Word document or a PowerPoint slide. You can also establish a link to your Excel charts so that if you change the data in your Excel file, it is automatically reflected in your Word or PowerPoint files. We will demonstrate both methods in this section.

PASTING A CHART IMAGE INTO WORD

For this exercise you will need **two** files:

- *The Excel spreadsheet you have been working on this chapter — **CH4 Charting**.*
- *A Word document data file — CH4 CC Enrollment*

Excel charts can be valuable tools for explaining quantitative data in a written report. Reports that address business plans, public policies, budgets, and so. For this example, we will assume that the total enrollment per state from the Enrollment Statistics Map chart is being used in a student's written report. (see **Figure 4.26**). The following steps demonstrate how to paste an image, or picture, of this chart into a Word document:

1. Open *CH4 CC Enrollment*. Save it as *CH4 Enrollment Totals Per State.*
2. Move your cursor to the bottom of the document by clicking below the heading that reads: **Figure 1: Enrollment by State**. The image of the Map chart will be placed below this heading.
3. If needed, open the Excel file you have been working with (*CH4 Charting)*. Activate the

Map chart.

4. On the **Home** tab of the ribbon. Click the **Copy button** dropdown arrow and select **Copy as Picture.**
5. Select **OK —** Accepting the Copy Pictures defaults:
    - As shown on Screen
    - Picture
6. Go back to the *CH4 Enrollment Totals Per State* Word document.
7. Confirm that the insertion point is below **Figure 1: Enrollment by State** heading, click the **Paste** button in the Home tab of the ribbon (or press **Crtl-V**).
8. Note the picture of the Map chart will need to be resized. Resize the image by slowly dragging one of the corner sizing handles so it's large enough to fill space below the text on the first page. Make sure the image does not spill over to the next page. This document should be one page only.
9. Save your work.

Enrollment in Community Colleges

The Portland metropolitan area benefits from a wide array of public and private colleges. By far, most students are enrolled at one of the local community colleges. Below is statistical information about community colleges on the West Coast. Highlighted are Oregon's top community colleges. This paper will compare Oregon's enrollment data to other states on the West Coast.

Portland Community College (PCC) is the largest, with four full fledges campuses and several smaller learning centers. In 2014, over 30,000 students attended Portland Community College. PCC offers certificate programs, Associates degree programs through 149 major areas.

Mt Hood Community College (MHCC) serves students who live north and east of Portland proper. In 2014, over 9,000 students attended MHCC. Mt Hood offers certificate programs, Associates degree programs with 99 different majors.

Clackamas Community College (CCC) serves students who live south of the Portland area. In 2014 over 7,000 attended CCC. They were offered certificate and Associates degree programs with a possibility of 88 majors.

Each college has plans to increase enrollment to more closely reflect the population of the metropolitan area.

Figure 1: Enrollment by State

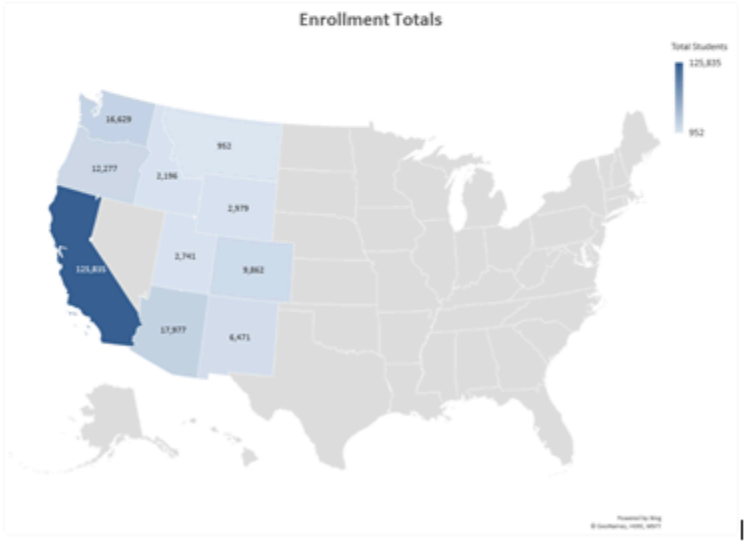


Figure 4.26 CH4 Enrollment Totals Per State

Skill Refresher

Pasting a Chart Image into Word

1. Activate an Excel chart and click the Copy button in the Home tab of the ribbon.
2. Click on the location in the Word document where the Excel chart will be pasted.
3. Click the down arrow of the Paste button in the Home tab of the ribbon.
4. Click the Picture option from the drop-down list.
5. Click the Format tab in the Picture Tools section of the ribbon.
6. Resize the picture by clicking the up or down arrow on the Shape Width or Shape Height buttons.

PASTING A LINKED CHART IMAGE INTO POWERPOINT

For this exercise you will need two files:

- *The Excel spreadsheet you have been working on in this chapter — **CH4 Charting**.*
- *A PowerPoint data file – CH4 PowerPoint CC*
- Microsoft PowerPoint is perhaps the most commonly used tool for delivering live presentations. The charts used in a live presentation are critical for efficiently delivering your ideas to an audience. Similar to written documents, a wide range of presentations may require an explanation of quantitative data. This demonstration includes a PowerPoint slide that could be used in a presentation. We will paste the linked Budget chart into the PowerPoint slide. As a result, if we change the chart in the Excel file, the change will be reflected in the PowerPoint file.

1. Open *CH4 PowerPoint CC .pptx*. Save it as **CH4 PowerPoint CC Enrollment**.
2. Navigate to **Slide 6** – **Budget To Increase Enrollment**. This is the slide where you will place the linked chart.
3. If needed, open the Excel file you have been working with (*CH4 Charting)*. Activate the **Budget** chart. Click copy, (not Copy as Picture.)
4. Go back to the *CH4 PowerPoint CC Enrollment* presentation.
5. Make sure you are still on Slide 6. Click into the empty prompt box on the right.
6. Click the **Paste** button dropdown arrow in the **Home** tab of the ribbon in the PowerPoint file, choose the Paste Option **Use Destination Theme and Link Data (L).**

Mac Users should choose "**Use Destination Theme"**

This pastes an image of the Excel chart into the PowerPoint slide yet changing the appearance to match the current theme of the PowerPoint slide.

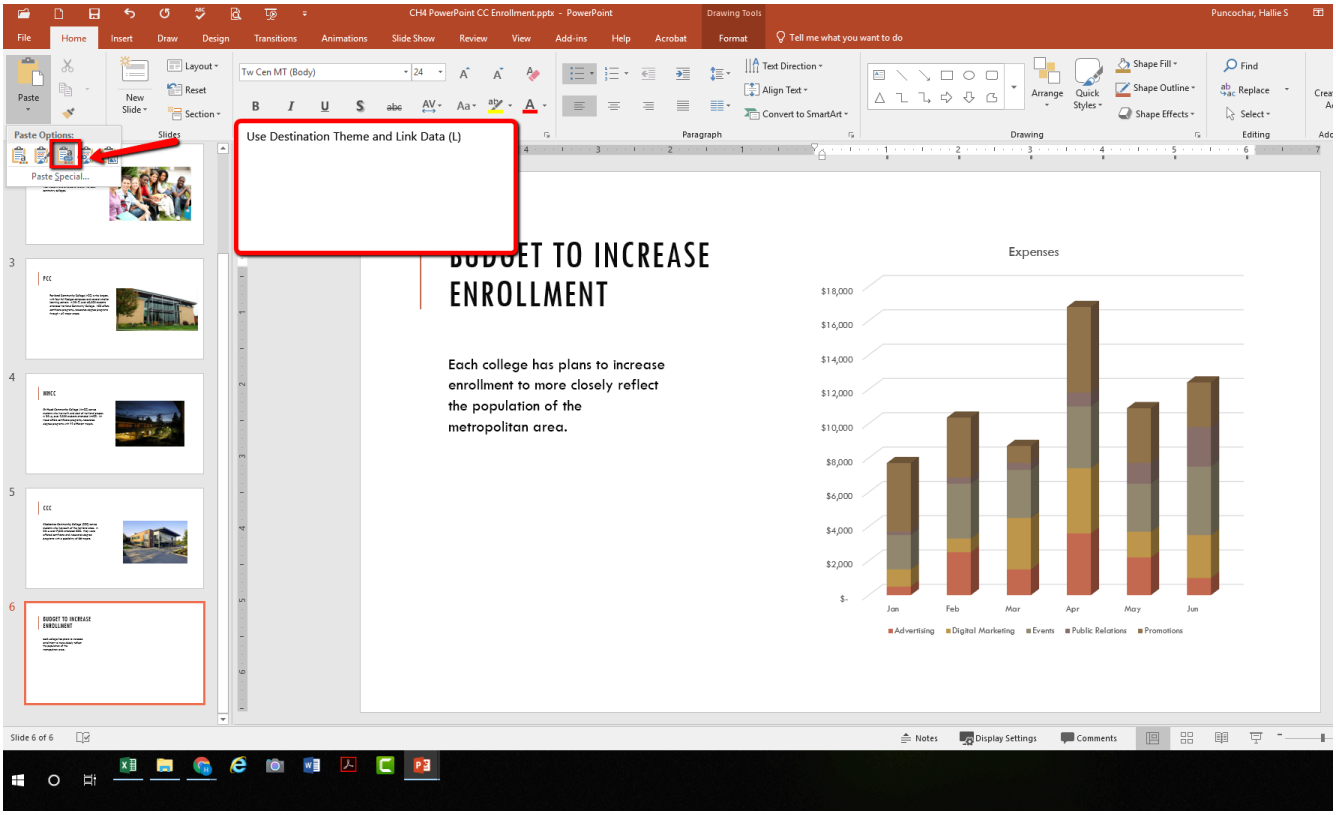


Figure 4.27 Use Destination Theme & Link_Data (L)

The benefit of adding this chart to the presentation as a link is that it will automatically update when you change the data in the linked spreadsheet file.

1. Return to your *CH4 Charting* Excel file.
2. Select the **Expenses** worksheet. The Advertising cost for June was cut. Update the spreadsheet to change. Change the value in cell G5 to **1000**.
3. Select the **Budget** worksheet. Notice how the chart has changed.
4. Return to the PowerPoint file. On Slide6, you should see the updated chart.
5. Save your work. You will submit both the **Word** and **PowerPoint** files, along with the **Excel** file, at the end of the next section.

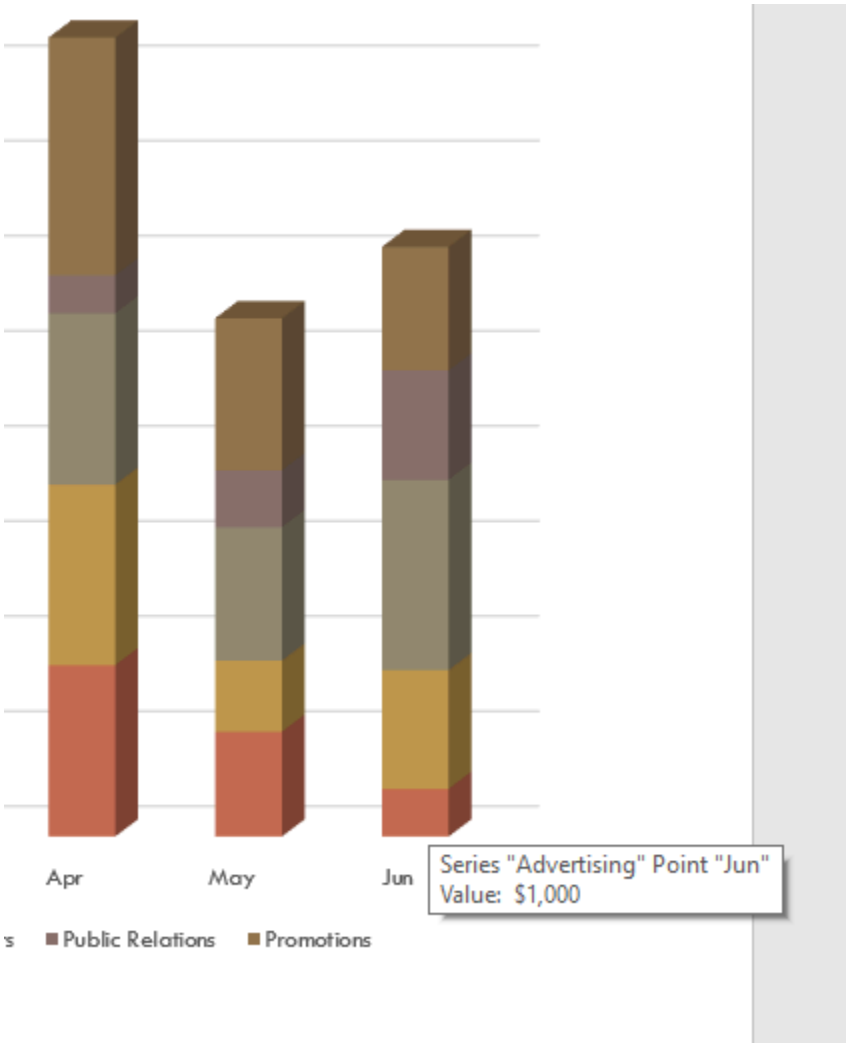


Figure 4.28 Updated June Advertising Cost

Integrity Check

Refreshing Linked Charts in PowerPoint and Word

When creating a link to a chart in Word or PowerPoint, you must refresh the data if you make any changes in the Excel workbook. This is especially true if you make changes in the Excel file prior to opening the Word or PowerPoint file that contains a link to a chart. To refresh the chart, make sure it is activated, then click the

Refresh Data button in the Design tab of the ribbon. Forgetting this step can result in old or erroneous data being displayed on the chart.

Integrity Check

Severed Link?

When creating a link to an Excel chart in Word or PowerPoint, you must keep the Excel workbook in its original location on your computer or network. If you move or delete the Excel workbook, you will get an error message when you try to update the link in your Word or PowerPoint file. You will also get an error if the Excel workbook is saved on a network drive that your computer cannot access. These errors occur because the link to the Excel workbook has been severed. Therefore, if you know in advance that you will be using a USB drive to pull up your documents or presentation, move the Excel workbook to your USB drive before you establish the link in your Word or PowerPoint file.

Skill Refresher:

Pasting a Linked Chart Image into PowerPoint

1. Activate an Excel chart and click the Copy button in the Home tab of the ribbon.
2. Click in the PowerPoint slide where the Excel chart will be pasted.
3. Click the down arrow of the Paste button in the Home tab of the ribbon.
4. Click the Keep Source Formatting & Link Data option from the drop-down list.
5. Click the Refresh Data button in the Design tab of the ribbon to ensure any changes in the Excel file are reflected in the chart.

Key Takeaways

- When pasting an image of an Excel chart into a Word document or PowerPoint file, use the **Picture** option from the Paste drop-down list of options – if you want the image to act as an image. You will not be able to make any changes to the content of the picture.
- When creating a link to a chart in Word or PowerPoint, you may need to refresh the data if you make any changes in the originating spreadsheet. You should not use the **Picture** option.

ATTRIBUTION

4.4 Preparing to Print

Learning Objectives

1. Review each worksheet in a workbook in Print Preview.
2. Modify worksheets as needed to professionally print data and charts.

In this section, we will take a look at each of the worksheets created in the previous sections. Since these worksheets contain a combination of data and charts, there are specific things to watch for if you will be printing the sheets.

We will start by looking at each worksheet in Print Preview in Backstage View. We will then make any changes necessary, such as changing the orientation and scaling or moving charts around on the worksheet. To make sure we don't miss any worksheets, we are going to review the worksheets in the order they appear in the tabs.

PREVIEWING CHART SHEETS FOR PRINTING

Data file: Continue with CH4 Charting.

The **All Excel Classes** is a chart sheet. This means that it does not contain any data; remember that chart sheets just contain charts. We still need to review it in Print Preview.

1. Click on the **All Excel Classes** worksheet tab.
2. Go to Print Preview by clicking Print in Backstage View.
3. Notice that the chart will print on the entire page, in Landscape orientation.
4. There is nothing to change. Exit Backstage View.

PRINTING WORKSHEETS WITH DATA AND CHARTS

The Stock Trend worksheet has a lot of data and multiple embedded charts. We need to print the data and the charts, which will require modifications to the page setup.

1. Click on the **Stock Trend** worksheet tab.
2. Go to Print Preview by clicking Print in Backstage View.

   Mac Users choose **"File/Print..."** from the Excel File menu option.

3. Notice that this worksheet is currently printing on seven pages.
4. As you click through each page you should make the following observations:

   - The data is split between the first and third pages.
   - The line chart starts on the first page, but part of it is also on the second page.
   - The double-line chart starts on the third page and then finishes on the fifth page.
   - The fourth and sixth pages are blank.
   - The last page (page 7) has a column of seemingly random numbers.

5. Exit Backstage View.
6. The first thing we are going to do is hide the numbers that are appearing on **page 7**. We are going to hide the column, instead of deleting the numbers, in case the numbers are being utilized somewhere else in the workbook.
7. Scroll to the right on the worksheet until you find the numbers in **column AH**.
8. Click anywhere in column AH.
9. On the Home ribbon, click the **Format** button in the Cells group.
10. In the Visibility section, select **Hide & Unhide** then select **Hide Columns**.

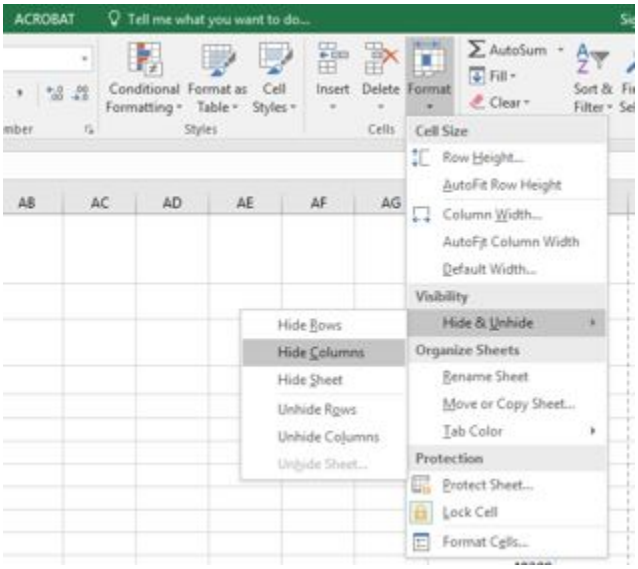


Figure 4.29 Hide Columns in Format Menu

11. The visible column headings should now go from AG to AI.

12. Return to Print Preview in Backstage View to see the changes to the printed worksheet.

13. Notice that there are now five pages. The data and charts are still splitting across multiple pages, but the numbers in column AH are no longer going to print.

14. Remain in Backstage View for the next steps.

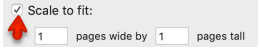
The data is still split between pages 2 and 3, and the charts are splitting oddly as well. The first step we will try to fix these issues is to change the page orientation and scaling.

1. While still in Backstage View, change the **page orientation** to Landscape (use the Orientation drop-down menu in the Settings section).

Mac Users click the **Landscape Orientation** button 

2. This puts all of the data on one sheet, but the charts are still split between multiple pages.

3. Change the **page scaling** to Fit Sheet on One Page (use the Scaling drop-down menu in the Settings section).

Mac Users click the **Scale to fit:** option 

4. This fits everything on one page, but it is too small to be able to read.

5. Change the page scaling back to No Scaling.

Mac Users: uncheck the **Scale to Fit** option

The next thing we will try is moving one, or both, of the charts. In order to move the charts, we need to exit out of Backstage View.

1. Exit Backstage View.

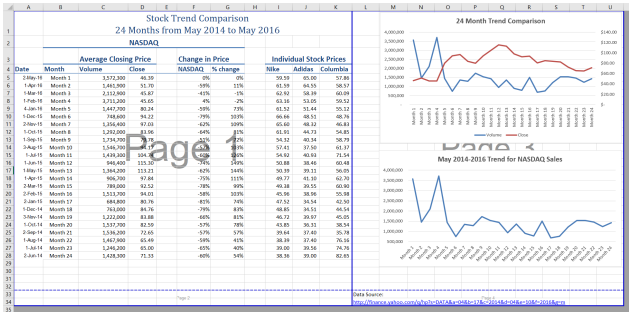
2. Switch to the View ribbon and then select Page Break Preview. Your screen should look similar to **Figure 4.30**. (Remember that the dotted blue lines indicate automatic page breaks.)

3. Move the 24 Month Comparison (double-line) chart closer to the top of its page.

4. Move the May 2014-2015 Trend for NASDAQ Sales Volume (line chart) so that it is under the 24 Month Comparison chart.

5. The link to the data source is still at the bottom of page 2 (in A50:A51) so you need to move it as well. Using your preferred method, move the text from A50:A51 to M31:M32.

Now your screen should look similar to **Figure 4.30**.



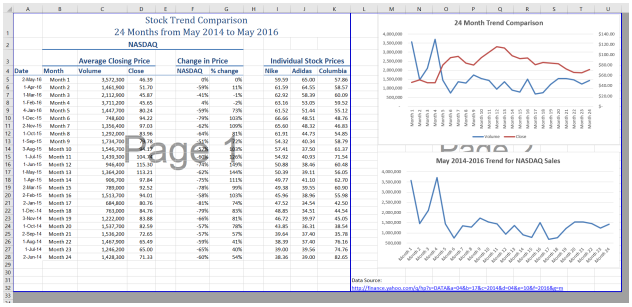
We don't want the data source link text to print on its own page, but there is no room to move it onto the same page as the charts. To fix this, we are going to remove the automatic page break between the charts and the text in M31:M32.

1. Place your pointer on the horizontal blue dashed line (automatic page break) between the line chart and the Data Source link text.

2. When your pointer changes to the double arrow (pointing up and down), drag the page break down into the gray area. This removes the page break.

3. If your vertical automatic page break between columns K and L moves, drag it back between columns K and L. This will make it a solid blue line, which will no longer adjust automatically.

Note: you may need to slightly re-size the two charts in order to make your screen look like Figure 4.31. Your "goal" is to only have two pages.



Now you need to do one final check of this worksheet in Print Preview.

1. Go to Print Preview and look at both pages. Page 1 should contain just the data and page 2 should have both charts and the Data Source link text.

2. Exit Backstage View and save the file.

PREVIEW REMAINING WORKSHEETS FOR PRINTING

The remaining worksheets need to be reviewed. Some of them will need minor changes and some will not need any changes. You will need to preview each one and then make the specified changes. In the following steps, you will preview and modify all other worksheets.

1. **Grade Distribution, Enrollment Statistics, and Admissions** sheets – the charts split across two pages. Fix this by changing the orientation (Landscape) and scaling (Fit Sheet on One Page).

2. **The remaining chart sheets** should not need any changes.

PRINTING A CHART ONLY

Sometimes you might have a worksheet that has data and a chart, but you only want the chart to print. That is the case with the **Enrollment Statistics** worksheet.

1. Switch to the **Enrollment Statistics** worksheet.

2. Select the **Gender Comparision** chart.

Mac Users: Steps 3-5 will not work in Excel for Mac. See alternate steps below step 5.

3. Go to Print Preview. Only the chart is printing. *(If it shows the data printing along with the chart, exit Backstage View and be sure to select just the chart on the worksheet.)*

4. If needed, change the orientation to Landscape. This orientation looks better when printing just a chart.

5. Exit Backstage View.

Mac Users: the **only** way to print a Chart separately is to click on the chart you want to print move it to a new sheet by clicking on the chart, click the **Move Chart** button on the **Chart Design** tab, click New Sheet then choose **File/Print** from the Excel menu and switch to Landscape Orientation if necessary.

HIDING A WORKSHEET

You have actually decided that you do not want the E**xpenses** sheet to be visible at all, but you do not want to delete it. We are going to hide it from anyone looking at the workbook.

1. Right-click on the **Expenses** tab.

   Mac Users should hold down the **CTRL** key and click on the **Expenses** tab

2. Select **Hide** from the menu that appears. The sheet should no longer be visible.

3. Save the **CH4 Charting** workbook.

4. Submit all three files from this chapter: **CH4 Charting.xlsx, CH4 CC Enrollment.docx**, and **CH4 PowerPoint CC Enrollment.pptx** as directed by your instructor.

ATTRIBUTION

4.5 Chapter Practice

To assess your understanding of the material covered in the chapter, please complete the following assignments.

Although Excel is primarily used in business and scientific applications, you will find it useful in other areas of study as well. In these exercises, we will use Excel to create charts using historical, and health data.

CHARTING HISTORICAL DATA (COMPREHENSIVE REVIEW)

Download Data File: PR4 Data

Excel is an excellent tool for helping display historical data. In this exercise, we will be examining ways to display information on minimum mage data and life expectancy.

TASK1 – NATIONAL MINIMUM WAGES CHANGES IN THE UNITED STATES 2019-2020

Since the beginning of the previous century, the United States has set a minimum wage, in order to set a "floor" beneath which wages cannot fall. Most states have set their own minimum wages, but none are lower than the national minimum wage. Follow the below steps to insert a Map Chart outlining what the current minimum wage is per state.

1. Open the file named **PR4 Data** and then Save As **PR4 Historical Data.**
2. On the **Minimum Wage** worksheet, select the range **B4:B55.** Press and hold the **CTRL** key and select **D4:D55**.

   Mac Users: hold down the "**Command**" key **not** the CTRL key
3. Select the **Insert** tab, then the **Map Chart** tool in the **Charts** group.
4. Move the Chart as a **New Sheet**. Rename the sheet **Map**.
5. Update the Chart Title to **US Minimum Wage 2020.**

6. From the **Charts Element** menu choose to display the **Data Labels**.

7. From the Charts Element menu, turn off the **Legend**.

8. Prepare the **Minimum Wage** worksheet for printing by changing the scaling to **Fit Sheet on One Page**.

9. Save your work.

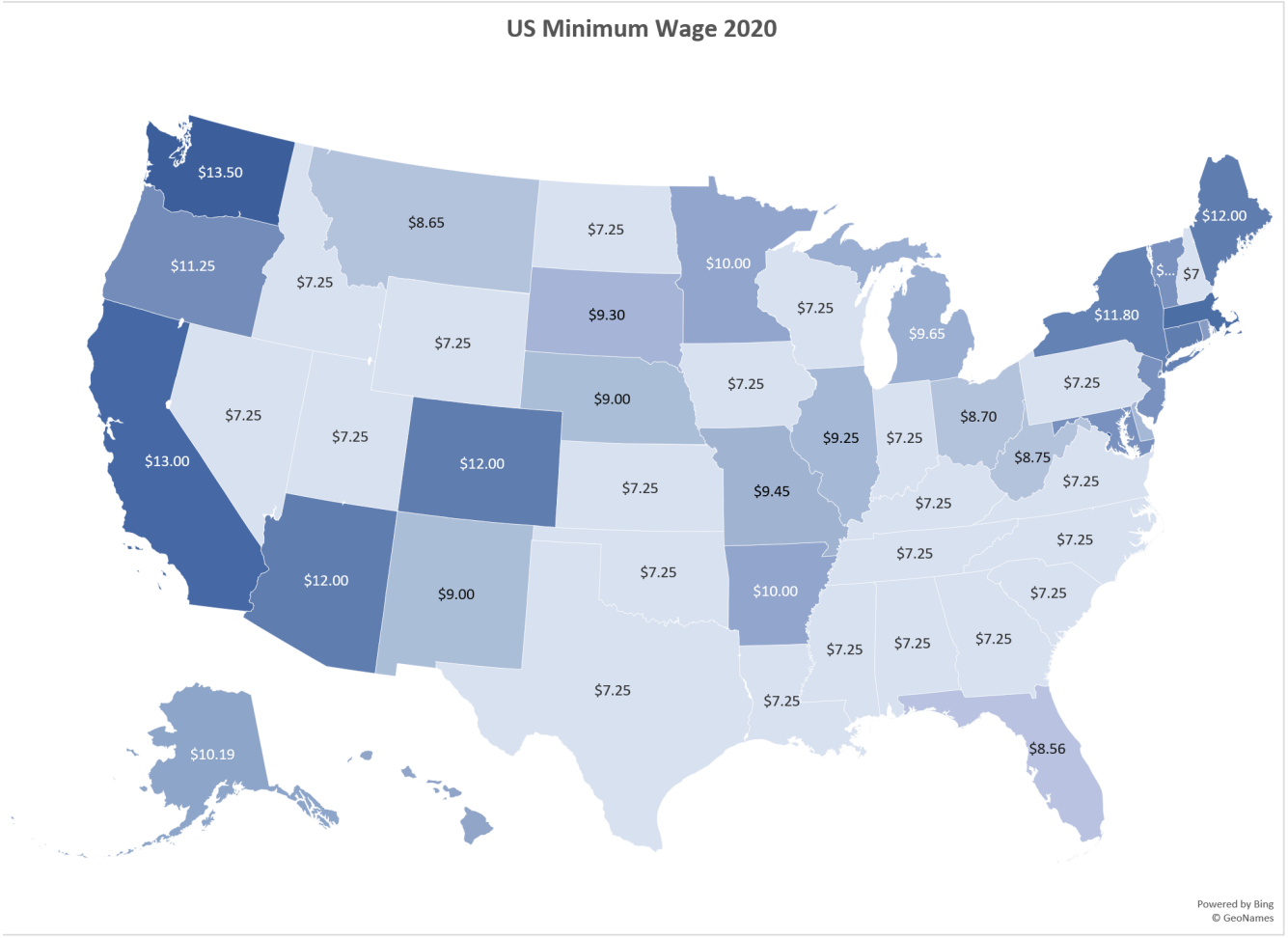


Figure 4.32 Map Chart

TASK 2 – OREGON: PROJECTED LIFE EXPECTANCY AT BIRTH

In the past 40 years, between 1970 and 2010, life expectancy for Oregon men improved by 8.7 years and for women by 5.5 years. Oregon's life expectancy has remained slightly higher than the U.S. average. The life expectancy will continue to improve for both men and women. However, the gain for men has been outpacing the gain for women. Consequently, the difference between men's and women's life expectancies has continued to shrink.

https://www.oregon.gov/das/OEA/Documents/OR_pop_trend2012.pdf

1. On the **Life Expectancy** sheet, select **A5:B11.**

2. From the Insert tab choose Recommend Charts. Select the second option, Clustered Column chart.

3. Move the chart to a new sheet. Name the sheet **Men.**

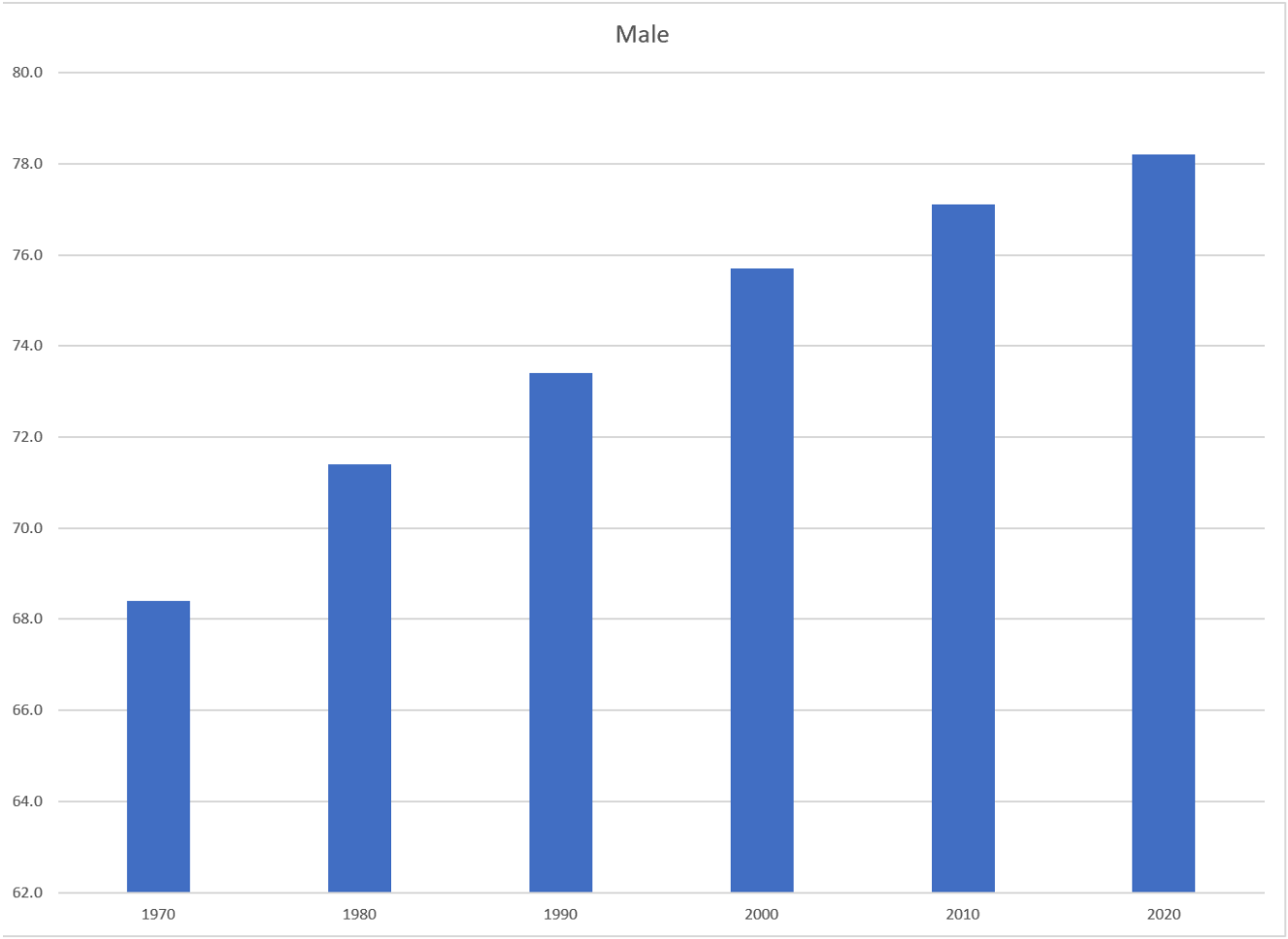


Figure 4.33 Male Bar Chart Solution

4. Repeat steps above to create a matching chart for **Life Expectancy for Oregon Women,** by selecting **A5:A11**. Press and hold the CTRL key and select **C5:C11**.

Mac Users hold down the **Command** key

5. Use the Recommended Charts and select the Clustered Column chart.

6. Move the chart to a new sheet. Name the sheet **Women**.

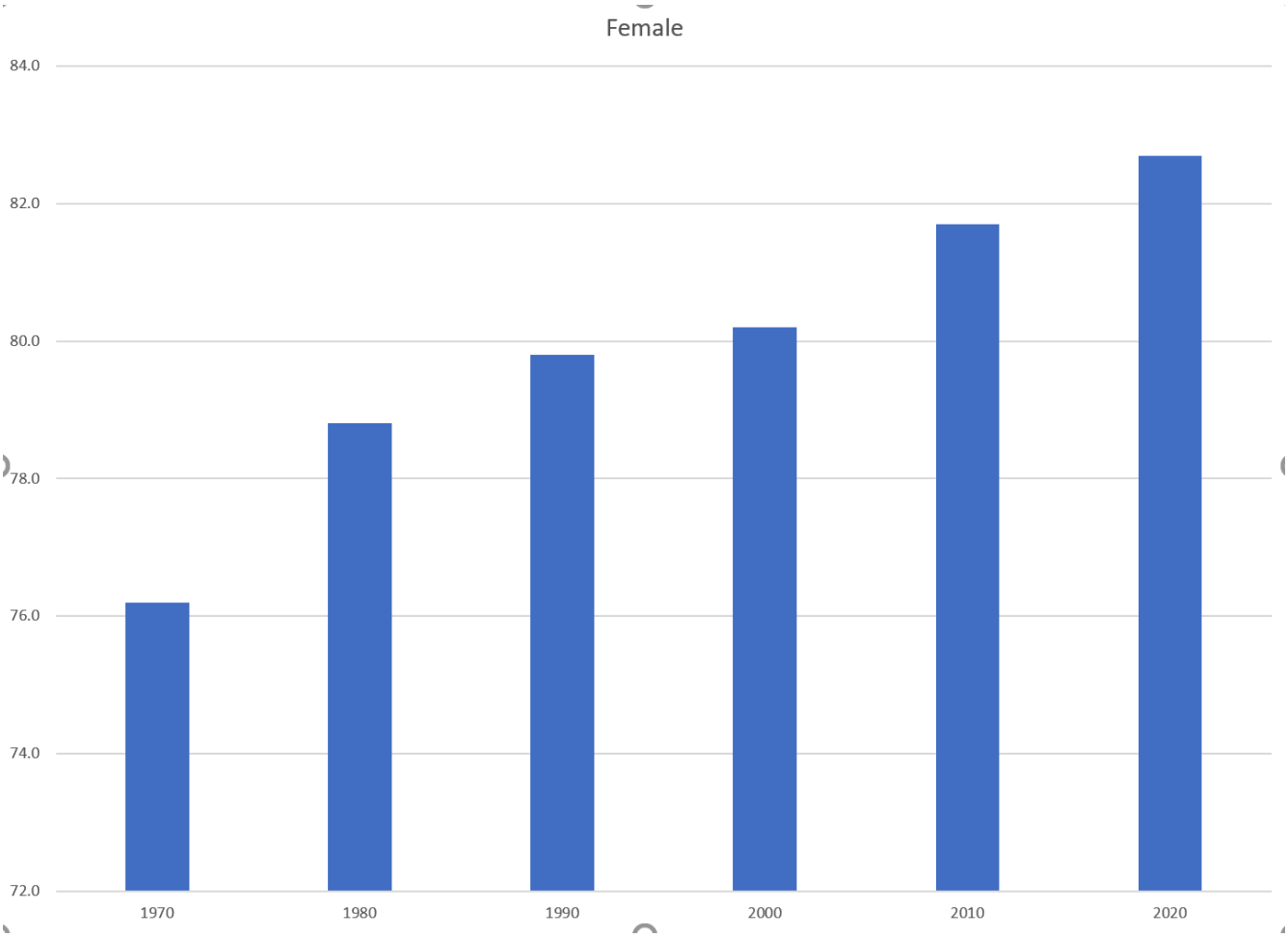


Figure 4.34 Female Bar Chart

7. Notice on the men's and women's vertical axis the min and maximum bounds do not match. To ensure data is comparable, adjust the min and max bounds of both the Mens and Womens chart to chart to match:

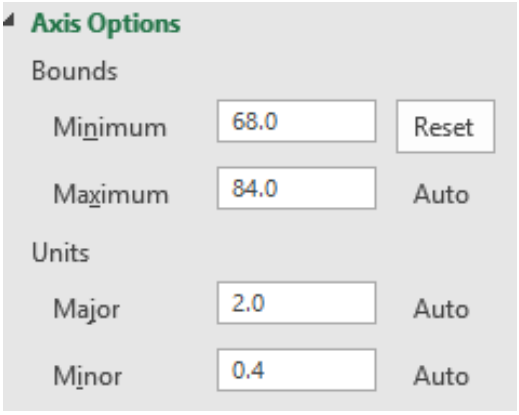
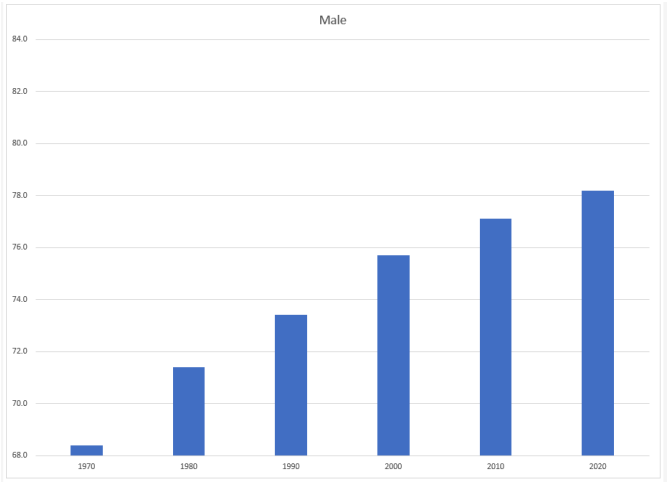
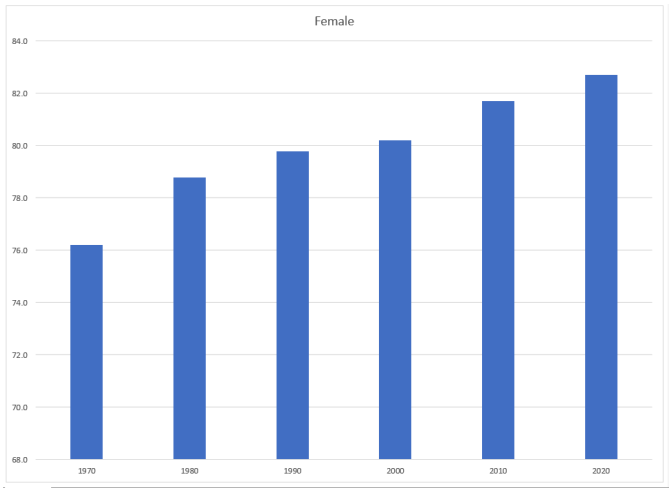


Figure 4.35 Axis Bounds





8. Return to the **Life Expectancy** tab, select **A5:D11.**

9. Use the **Recommended Charts** tool to create a simple line chart.

10. Change the Chart Title to **Oregon: Projected Life Expectancy at Birth**.

11. Leave the chart embedded in the worksheet. Move and resize it accordingly.

12. The line across the bottom of the chart represents the difference between men's and women's life expectancy. It is not very helpful as it is. Right-click on the line to open the pop-up menu. Select **Format Data Series**. In the **Format Data Series** pane, under the **Series Options** tab, select the radio button in front of **Secondary Axis**.

> Mac Users should hold down the **CTRL key** and click the line at the bottom. Select **Format Data Series**. In the **Format Data Series** pane, under the **Series Options** tab, select the radio button in front of **Secondary Axis**.

13. Close the **Format Data Series** pane.

14. Use the **Chart Style**s tools to change your chart to something a bit more dramatic.

15. Preview the **Life Expectancy** worksheet in Print Preview and make any necessary changes. The solutions are shown in below in Figure 4.35.

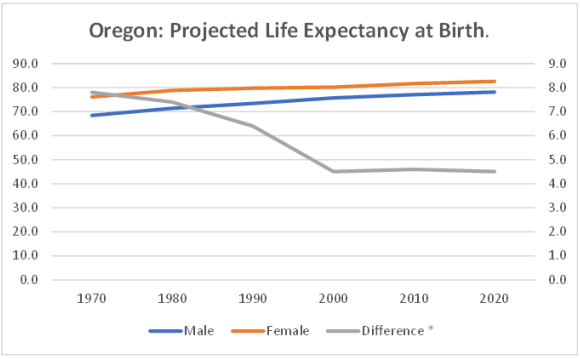
16. Check the spelling on all of the worksheets and make any necessary changes. Save the **PR4 Historical Data** workbook.

17. Submit the **PR4 Historical Data** workbook as directed by your instructor.

OREGON: Projected Life Expectancy at Birth

https://www.oregon.gov/das/OEA/Documents/OR_pop_trend2012.pdf

Birth Year	Male	Female	Difference *
1970	68.4	76.2	7.8
1980	71.4	78.8	7.4
1990	73.4	79.8	6.4
2000	75.7	80.2	4.5
2010	77.1	81.7	4.6
2020	78.2	82.7	4.5



Difference: * Female minus Male

In the past 40 years, between 1970 and 2010, life expectancy for Oregon men improved by 8.7 years and for women by 5.5 years. Oregon's life expectancy has remained slightly higher than the U.S. average. The life expectancy will continue to improve for both men and women. However, the gain for men has been outpacing the gain for women. Consequently, the difference between men's and women's life expectancies has continued to shrink.

Sources: 1970 & 1980: U.S. Department of Health and Human Services, National Center for Health Statistics.
1990 to 2020: Oregon Office of Economic Analysis

Figure 4.36 Projected Life Expectancy Line Chart

ATTRIBUTION

4.6 Scored Assessment

CHARTING SALES DATA

Download Data File: SC4 Data

An effective way to communicate findings in Excel is by graphing data. Graph the attached sales information, visualizing profit margin trends, and production patterns, and the sales pipeline; enabling decision-makers to grasp concepts of current business practices.

TASK 1 REVENUE & PROFIT MARGIN

Following the directions below create the below charts. Note to **match each chart exactly**, including the chart styles, and axis bounds.

1. Open the file named **SC4 Data** and then Save As **SC4 Sales.**
2. From the **Revenue & Profit Margin** sheet, create the below Combination Chart.
3. Move the chart to a new sheet. Name the sheet **Combo**.
4. Save your work.

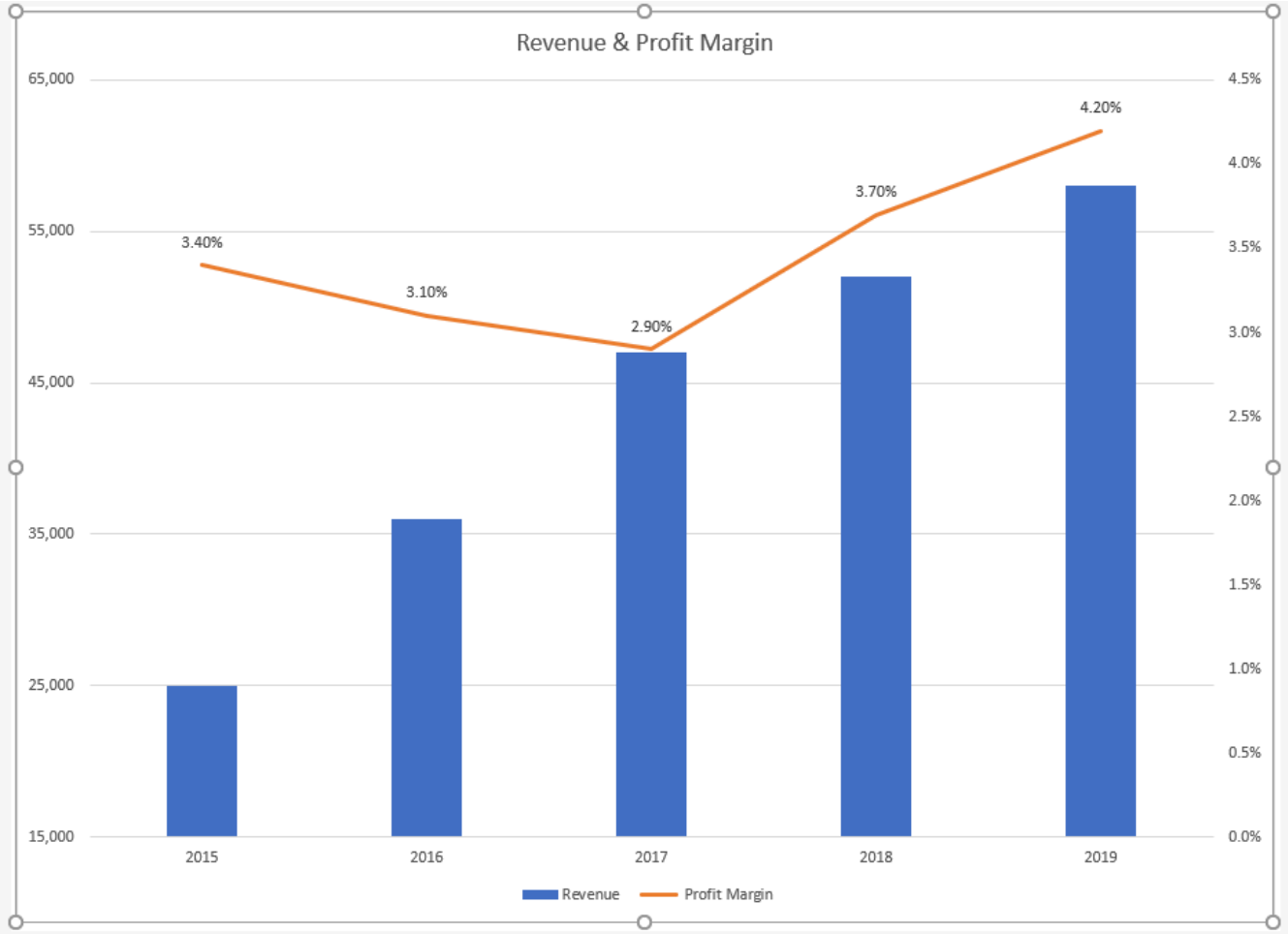


Figure 4.36 Combination Chart

TASK 2 QUARTLY PRODUCTION DATA

Create the below Pie Chart showing how many locations will be producing products in the North, South, East and West Regions.

1. From the **Products sheet** create the below chart.
2. Move the chart to a new sheet. Name the sheet **Doughnut**.
3. Save your work.

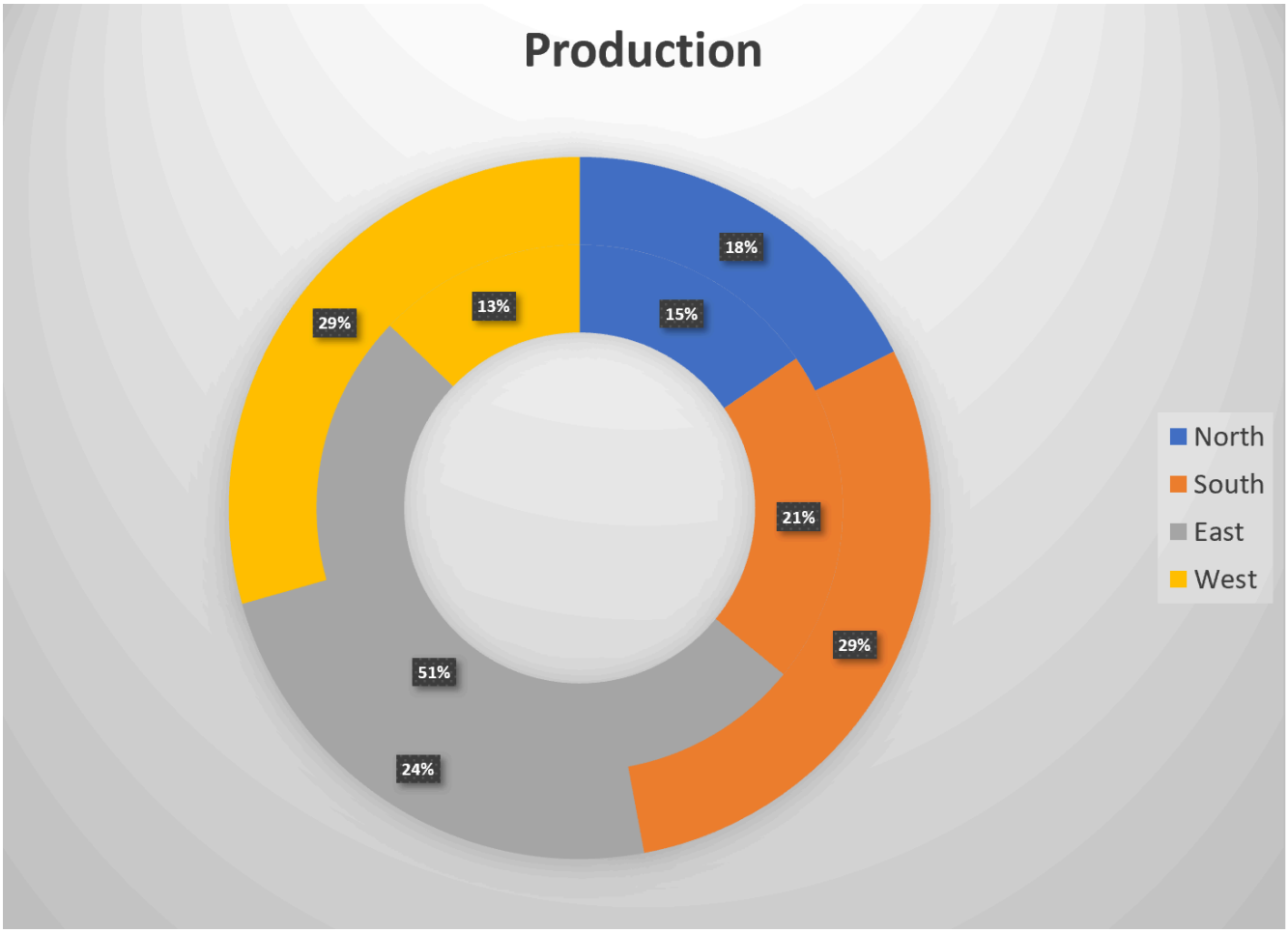


Figure 4.37 Doughnut Chart

TASK 3 SALES PIPELINE

Create the below Funnel Chart to provide our sales team a visual snapshot of the company's **sales** process, outlining deals that are expected to close within the month.

1. From the **Sales** sheet, create the below Funnel Chart.
2. Note to leave the chart embedded in the sheet. Resize, and move the chart accordingly.
3. Check the spelling on all of the worksheets and make any necessary changes. Save your work and submit **SC4 Sales** as directed by your instructor.

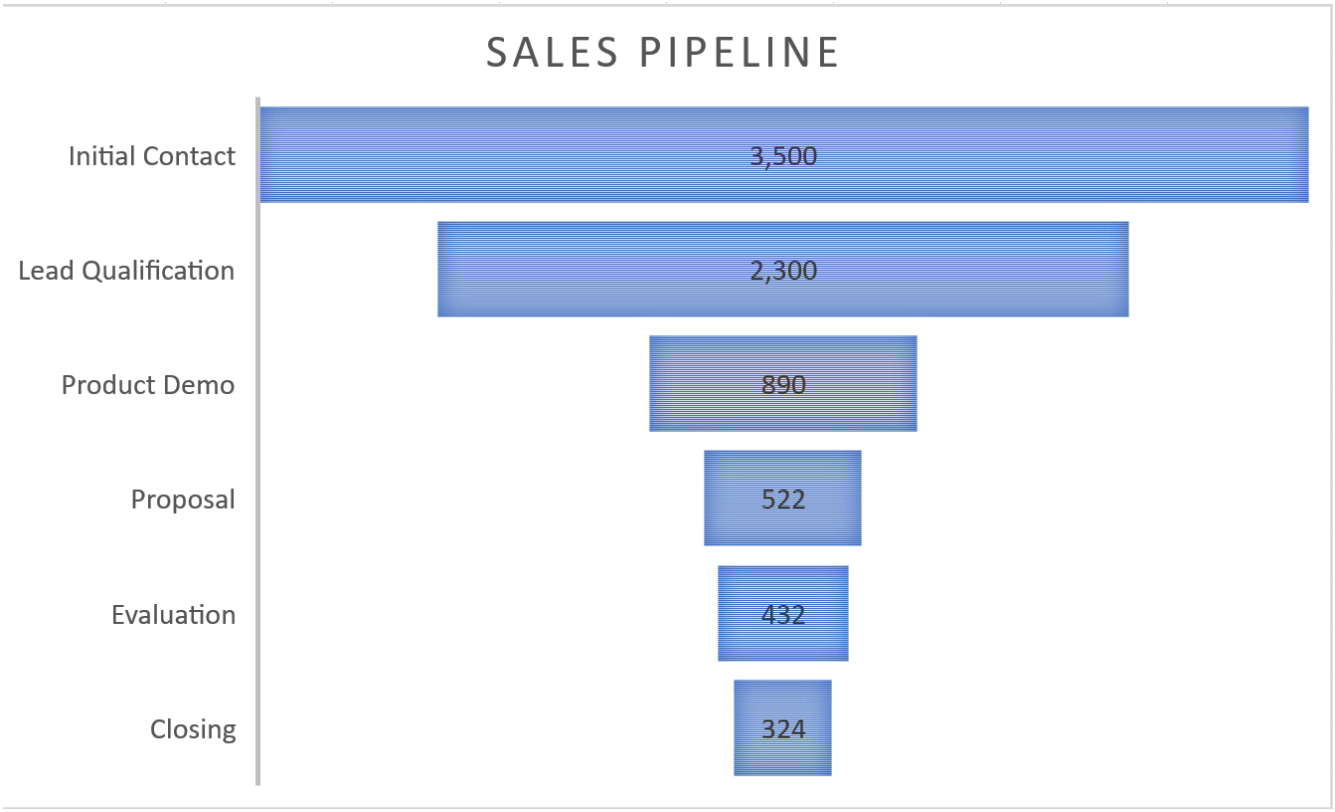


Figure 4.38 Funnel Chart

ATTRIBUTION

CHAPTER 5 – TABLES

Excel is the leading application for storing, managing and analyzing data. In Chapter 5, you will explore how to import, organize, and analyze data effectively. To manage and analyze a group of related data, users can turn a range of cells into an Excel table.

A table, also called a database, is an organized structure of rows and columns of related data in a worksheet; for example, a list of employee information. In a table of employees, each employee would have a separate record; as shown below, each record might include several fields, such as the Employee ID Number, their Last Name, and First Name, etc. Each row of a table stores records, and each column stores one field for the record. A record also can include fields that contain references, formulas, and functions. Additionally, a row of column headings at the top of the table stores field names that identify the data being collected and stored.

Excel has a vast collection of database and tabling tools that allow users to import, clean, sort, filter, total, subtotal, analyze, visualize, and report. This chapter explores how to import, insert, edit, and examine data with Excel table and PivotTable tools. Demonstrate skills by studying the provided 2017-2018 employee database. Examine employee relations, payroll, benefits, and training options.

ATTRIBUTION

5.1 Table Basics

Learning Objectives

1. Understand table properties and structure.
2. Format data as a table.
3. Use Freeze Panes.
4. Work with the Table Tools Design tab.

Organizing, maintaining, analyzing, and reporting human resources data is essentials across industries. In this chapter, we will import data, and demonstrate tabling skills by examining employee relations, payroll, benefits, and training options.

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary
1102	Vanesa	Allen	7/10/2012	3.48	4/11/1961	55	Portland	FT	$ 106,010
1106	Elizabeth	Allen	11/6/2015	2.15	11/23/1991	25	Seattle	FT	$ 42,182
1110	James	Anderson	12/4/2015	2.08	10/15/1966	50	Portland	FT	$ 92,254
1114	Katherine	Baker	3/24/2003	14.78	12/8/1964	52	Seattle	FT	$ 69,250
1118	Ina	Baker	5/23/2009	6.61	2/15/1962	54	Portland	FT	$ 102,567
1122	Brandon	Barnes	8/12/2002	15.40	10/15/1968	48	San Francisco	FT	$ 94,517
1126	Paul	Benham	11/6/2015	2.15	3/20/1973	43	San Diego	FT	$ 51,791
1130	Santos	Bennett	6/10/2010	7.56	4/20/1966	50	San Diego	FT	$ 32,530
1134	James	Bennett	1/20/2016	1.95	3/21/1957	59	Seattle	FT	$ 94,502
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$ 45,671
1142	Gregory	Blackshear	7/16/2009	6.47	2/8/1986	30	Seattle	FT	$ 70,346
1146	Thomas	Bradley	4/12/2008	9.73	7/13/1986	30	San Diego	FT	$ 34,685
1150	Linda	Brown	3/13/2012	5.81	7/8/1949	67	Portland	FT	$ 96,944
1154	Santina	Bryant	8/8/2015	2.40	12/1/1956	60	Portland	FT	$ 92,091
1158	Charlotte	Burgess	7/17/2015	2.46	7/12/1959	57	San Diego	FT	$ 30,150
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$ 81,536
1166	Ramon	Cannon	10/4/2013	4.24	10/25/1959	57	San Francisco	FT	$ 96,021
1170	Antolin	Casas	9/7/2012	5.32	3/11/1961	55	San Diego	FT	$ 58,720

Figure 5.1 Table Example

TABLE PROPERTIES & STRUCTURE

Turning a range of cells into an Excel table makes related data easier to analyze, visualize, and report. Structuring and planning table layouts are vital for data integrity. Below are guidelines to consider when designing and building a table from scratch:

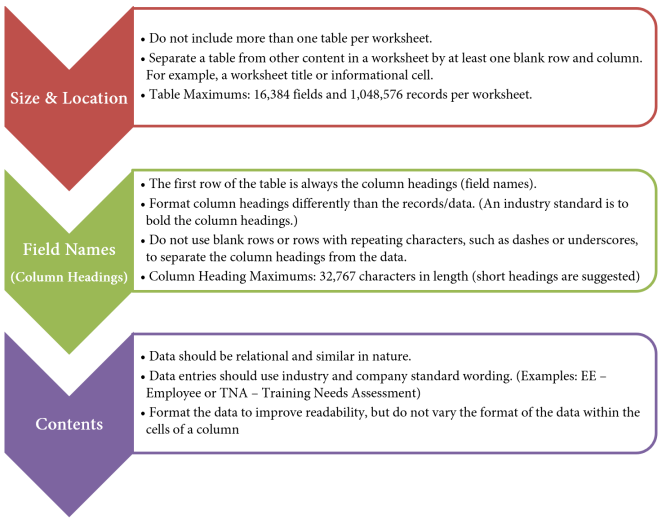


Figure 5.2 Table Layout Guidelines

OVERVIEW

Excel tables behave independently from the rest of the information on the worksheet. Excel treats the table area as a database locking the record entries together. There are several advantages of Excel treating the data independently. For example, using integrated filters and sort functions you can effortlessly drill down data based on questions and in return get results. Excel will also automatically expand the table to accommodate new data entries and allows for automatic formatting, such as recoloring of banded rows or columns.

You will also notice Excel treats formulas and calculations differently in a table, showing structured column names, along with automatically filling a calculated field to the entire table or offering quick and easy table totaling tools.

When graphing and charting table data you will also see Excel automatically adjusts of associated charts and ranges based on what the user is sorting or filtering at the time.

In industry, data is commonly stored in databases or multiple Excel files. Databases vary drastically, therefore in some cases, it is necessary to import data types into Excel. In our example, we will work with an Excel file that has imported data from a human resources database. The data downloaded from the database is stored in an Excel workbook, however, it's in a Comma Sepa-

rated Values (CSV) format. We will import the Excel file into our CH 5 Data file, turn the data into a table for further analysis.

IMPORT AND FORMAT DATA AS A TABLE

Download Data file: *CH5 Data*

CH-5-HR_

Keeping the above table guidelines in mind, import human resource data into Excel, as a table. Demonstrate tabling skills by examining employee relations, payroll, and benefits. Note you will need to save the **CH 5 HR** file on your computer as you will import this file into the **CH 5 Data** file in the below steps.

1. Open data file **CH 5 Data** and save the file as **CH5 HR Report**.
2. In the **EmployeeData** sheet, click on cell **A5**.

   Mac Users: Excel for Mac does not have the tool for "Getting Data" from an Excel Workbook. You will set up this data using alternate steps. **Please skip steps 3-11.** The alternate steps can be found below after Step 11.

3. From the Data tab, choose **Get Data**.
4. From the Get Data menu, choose **From File,** then **From Workbook**.

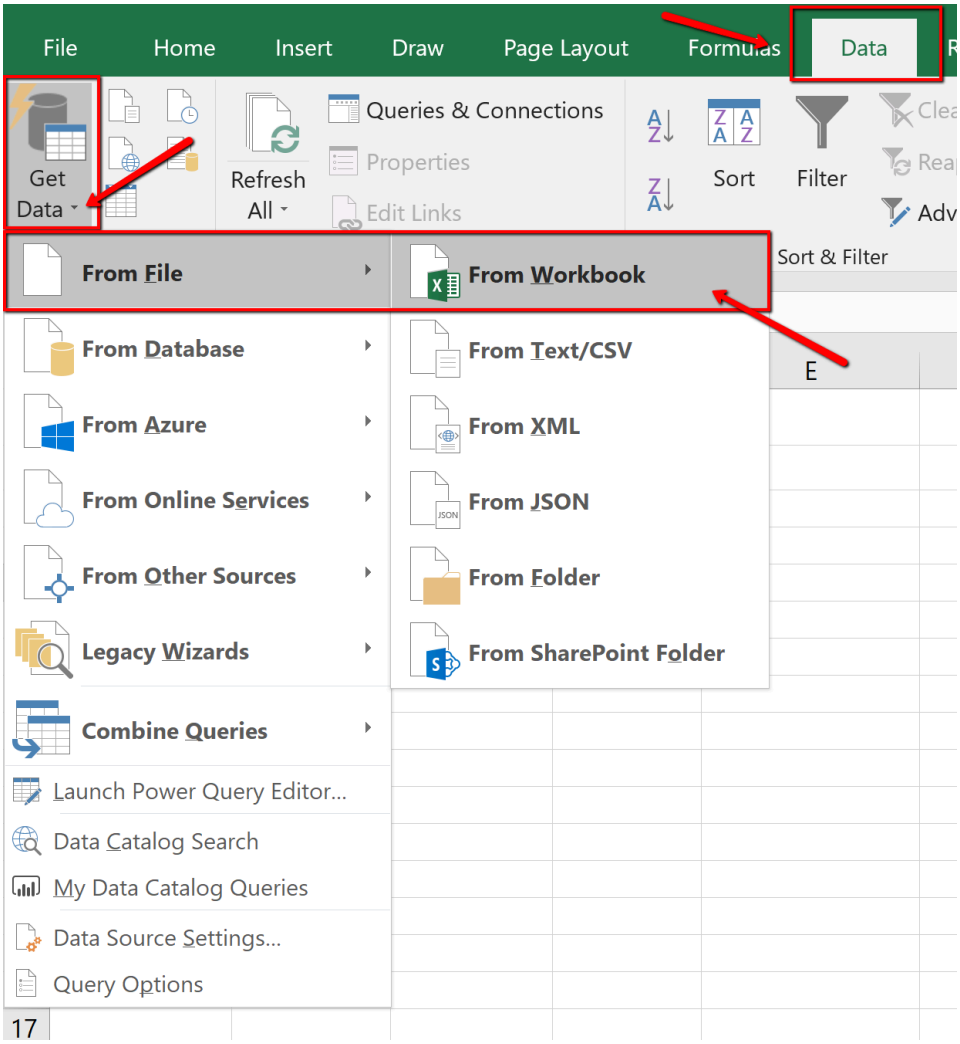


Figure 5.3 Get Data From File, From Workbook

5. Navigate to the course data files. Find, and select the **CH 5 HR** file.

6. Click **Import.**

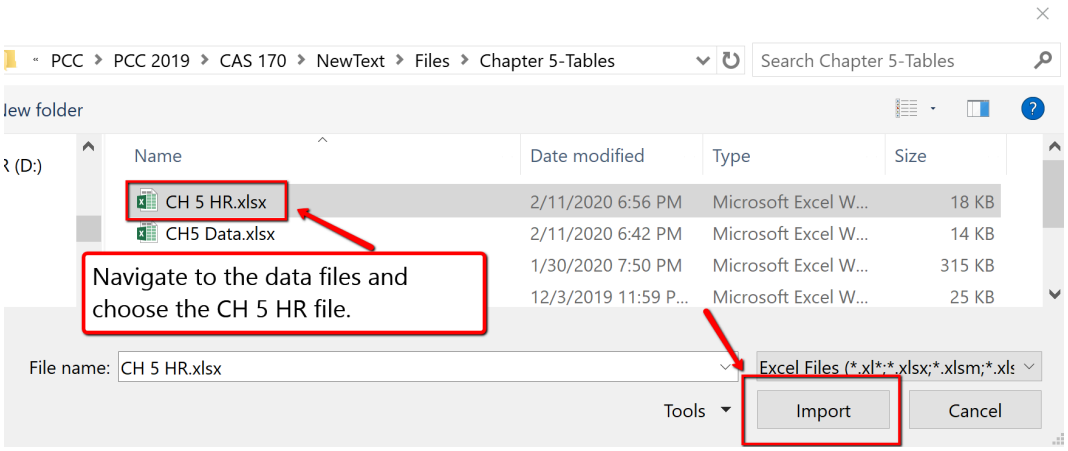


Figure 5.4 Import File Data CH 5 HR

7. The Navigator dialogue box will open. Select the **CH5 CSV File** listed in the Display Options pane.

8. At the bottom of the Navigator dialogue box, select **Load** to expand the menu and choose **Load To**...

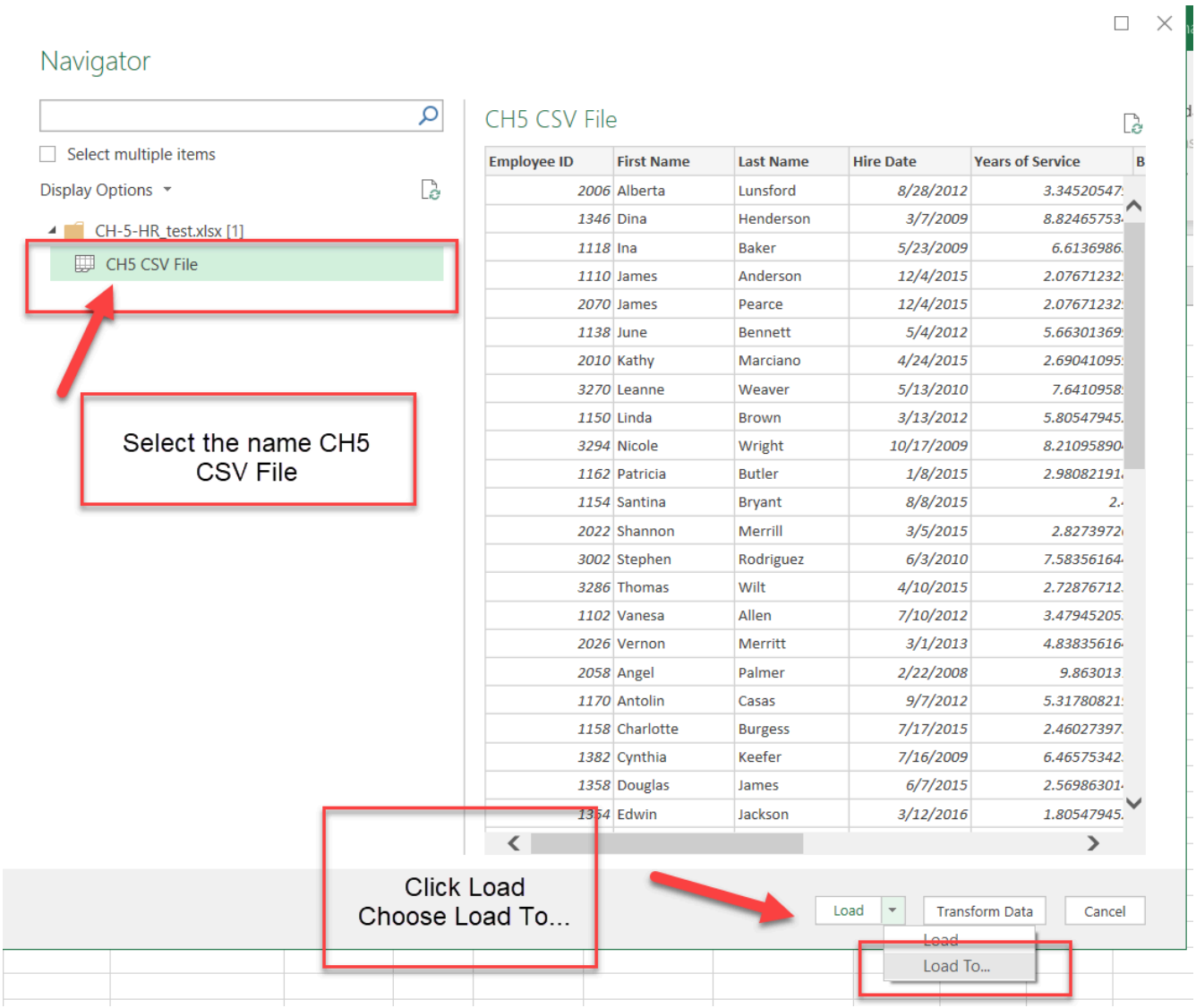


Figure 5.5 Navigator Window

9. The Import dialogue box will open. In the "**Where do you want to put the data?**" section choose **Existing worksheet:**

10. In the above steps A5 was already selected when we started the import, so Excel will indicate we want the information to import and display starting at cell =$A$5. If you did not click cell A5, then select the cell now. Click **OK.**

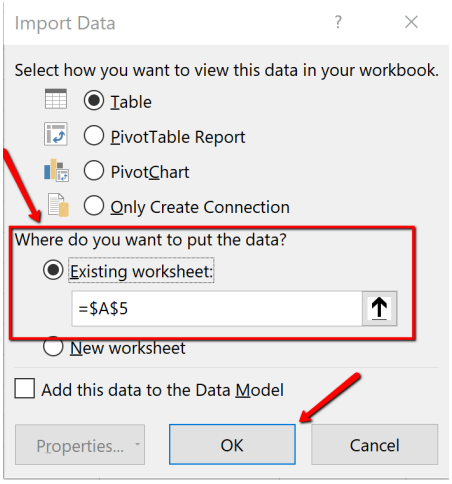


Figure 5.6 Import Data Dialogue Box

11. The data imports as a table. Close the Queries & Connections dialogue box.

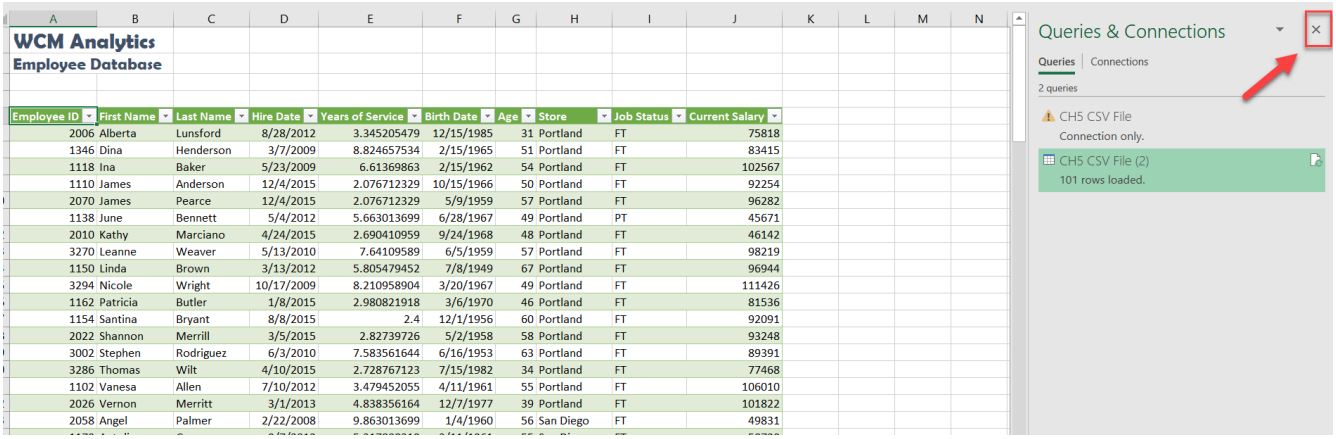
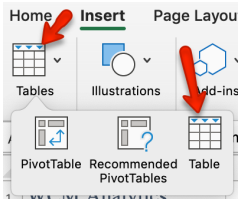


Figure 5.7 Close Queries & Connections

These are the alternate steps for Mac Users Only. If you are using Excel for Windows, please continue with the "Table Tools Design Tab" section below these alternate steps.

1. Only complete the following steps if you are using a Mac. If you are using a PC, you have already inserted the table. You should already have the **CH 5 HR Report** open and you should have clicked into cell A5 in the **EmploymentData sheet.** If you did not do this, please do it now.
2. Open the **CH 5 HR** workbook that you downloaded
3. Use the keyboard shortcut of **Ctrl key + letter A** to select all of the data in the worksheet. That should be cells A1:J102
4. Copy this data

5. Switch back to the **CH 5 Report** workbook and make sure cell A5 is the active cell
6. Paste the data into the **Employment Data sheet at cell A5**
7. Make sure Cell A5 is still the active cell and click the **Insert tab** from the Ribbon



8. Click the **Tables** button from the Ribbon and then click the **Tables** icon
9. The **Create Table** dialog box should appear with the cell range of **A5:J106 as shown here in Figure 5.8.** Click **"OK"** to accept this range for your table**.**

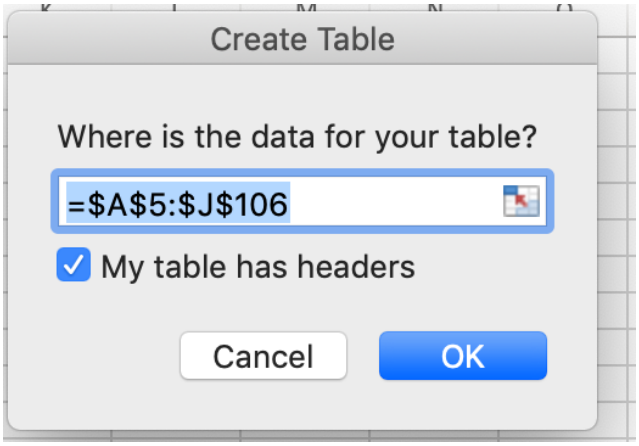


Figure 5.8 Excel for Mac Create Table Dialog Box

10. **Congrats!** You just converted the data to an Excel table. Continue following the steps in the section below.

TABLE TOOLS DESIGN TAB

Excel tables require specific tools. The Table Tools Design tab houses these specific tools used for formatting and editing tables. The Table Tools tab is considered a contextual tab; meaning the tabs appear when you are clicked in a table area. When you click out of a table, the Table Tools disappear.

Explore the table tools now. Notice the specific checkboxes to turn on table options, for example, you can choose to display banded rows or banded columns, or a total row etc. We will explore table tools in the following steps.

When importing data as a table, Excel automatically applied table formatting. Follow the below steps to format and edit the table.

1. Click the **Table Tools/Design** tab on the ribbon.

Mac Users: you don't have a Table Tools/Design tab. Just make sure the Table tab is selected.

2. From the provided **Table Styles**, choose the **Blue, Table Style Medium 2** option.

Mac Users: the table you just created may already have the "Blue, Table Style Medium 2 option.

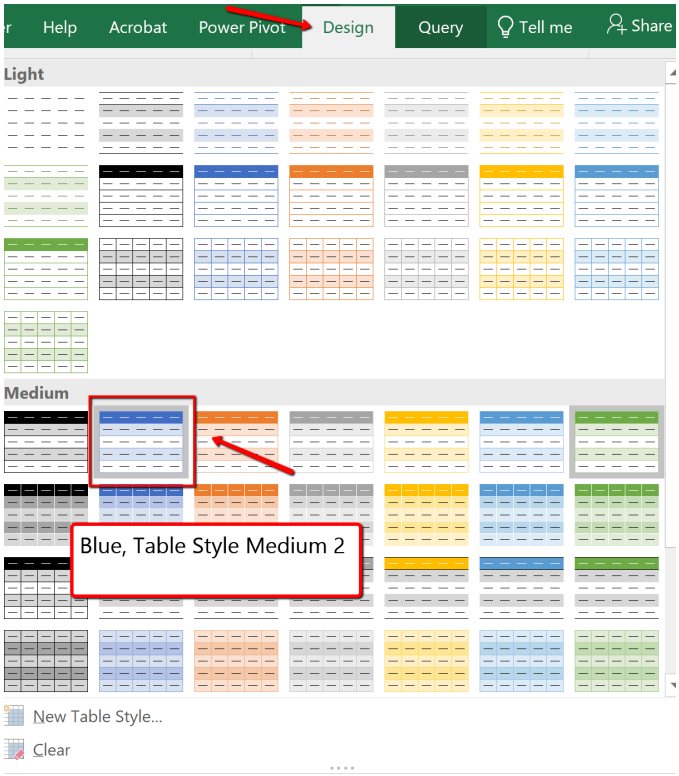


Figure 5.9 Blue Table Style Medium 2 Option

Another option for inserting a table is using the Insert button. The Insert Table button, located on the Insert tab will turn a range of information into an unformatted table. We will use the insert table option later on in the chapter.

Skill Refresher
Format Data as a Table

1. Click on the top-left cell in your data.
2. Click the Format As Table menu from the Home tab on the Ribbon. Choose a style.
3. Make sure “My table has headers” is checked. Click OK.
4. Click on the top-left cell again.
5. Adjust the widths of the columns so that you can see the complete headings with the filter arrows showing.

VIEWING TABLE DATA

USING PANES

Data sets can bridge thousands of records with dozens of fields and extend beyond a workbook window. It can be difficult to compare fields and records in widely separated columns and rows. One way of dealing with this problem is by dividing the workbook window into viewing panes by using the **Split** view option. Excel can split the workbook window into four sections called panes with each pane offering a separate view into the worksheet. By scrolling through the contents of individual panes, you can compare cells from different sections of the worksheet side-by-side within the workbook window.

To split the workbook window into four panes, select any cell or range in the worksheet, and then on the View tab, in the Window group, click the Split button. Split bars divide the workbook window along the top and left border of the selected cell or range. To split the window into two vertical panes displayed side-by-side, select any cell in the first row of the worksheet and then click the Split button. To split the window into two stacked horizontal panes, select any cell in the first column and then click the Split button. To turn off the Spilt window option, simply click Split again on the View tab.

In our specific example the data set is manageable, however freezing the first column, and the top heading could be useful when scrolling through data.

FREEZE PANES

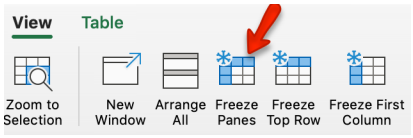
To keep an area of a worksheet visible while you scroll to another area of the worksheet use Freeze Panes. Follow the steps below to freeze, based on selection, the first column, and heading row.

1. If needed, adjust column widths so all heading names in row 5 are visible.

2. Click cell **B6** in the table. (By selecting this specific cell, when we apply the freeze pane option, Excel will freeze the table where the first column ends and the heading row is viewable.)

3. Click the View tab.

4. Select Freeze Panes, and for the listed options choose Freeze Panes (See **Figure 5.10 below)**. The column and rows will remain visible based on the cell that was selected above.



Mac Users should just click the **Freeze Panes** button under the View tab.

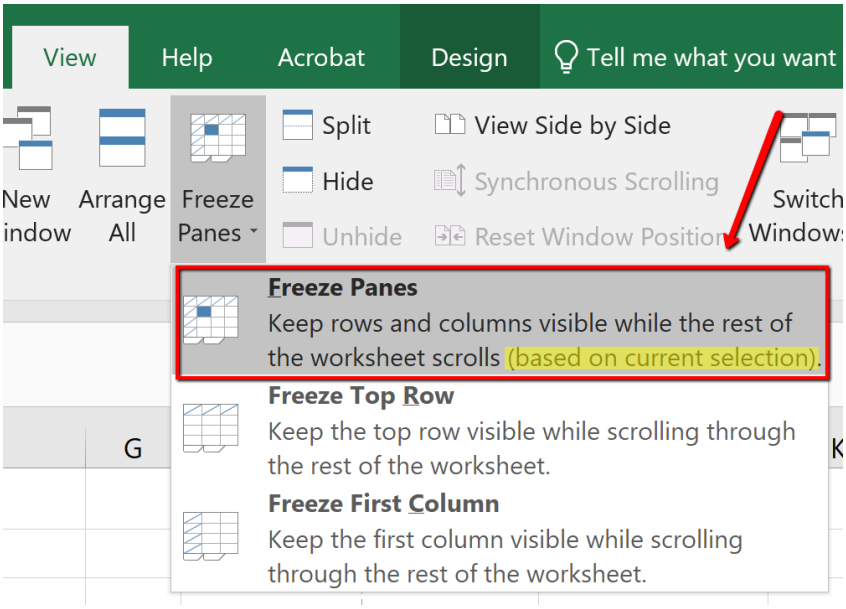


Figure 5.10 Freeze Panes

FORMATTING TABLE DATA

After reviewing the table, two columns have data that need to be formatted accordingly. In large data sets, it is useful to know data selection short cuts. In this example, we are going to use keyboard short cuts to select a column of information in the table and apply number formatting.

Format data by following the below steps:

1. In the EmployeeData sheet, click cell **E6**.

2. On the keyboard press and hold the **CTRL** and **SHIFT** and **DOWN** keys.

3. With the "Years of Service" data selected, click the Home tab. In the Numbers category, format the data as a Number. The number should automatically decrease the decimal to two decimal places.

Mac Users: click the **"list arrow"** next to **"General,** 

and then choose **"Number"** from the list.

4. Click in cell J6. *(Be sure you have clicked J6 so that you are in the first cell in the Current Salary column)*. Using the same selection process, select the Current Salary column, and format the data as Currency, zero decimal place.

5. Using the non-adjacent selection method, select column headings E, G, and I, and center the data.

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary
2006	Alberta	Lunsford	8/28/2012	3.35	12/15/1985	31	Portland	FT	$75,818
1346	Dina	Henderson	3/7/2009	8.82	2/15/1965	51	Portland	FT	$83,415
1118	Ina	Baker	5/23/2009	6.61	2/15/1962	54	Portland	FT	$102,567
1110	James	Anderson	12/4/2015	2.08	10/15/1966	50	Portland	FT	$92,254
2070	James	Pearce	12/4/2015	2.08	5/9/1959	57	Portland	FT	$96,282
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$45,671
2010	Kathy	Marciano	4/24/2015	2.69	9/24/1968	48	Portland	FT	$46,142
3270	Leanne	Weaver	5/13/2010	7.64	6/5/1959	57	Portland	FT	$98,219
1150	Linda	Brown	3/13/2012	5.81	7/8/1949	67	Portland	FT	$96,944
3294	Nicole	Wright	10/17/2009	8.21	3/20/1967	49	Portland	FT	$111,426
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$81,536
1154	Santina	Bryant	8/8/2015	2.40	12/1/1956	60	Portland	FT	$92,091
2022	Shannon	Merrill	3/5/2015	2.83	5/2/1958	58	Portland	FT	$93,248
3002	Stephen	Rodriguez	6/3/2010	7.58	6/16/1953	63	Portland	FT	$89,391
3286	Thomas	Wilt	4/10/2015	2.73	7/15/1982	34	Portland	FT	$77,468
1102	Vanesa	Allen	7/10/2012	3.48	4/11/1961	55	Portland	FT	$106,010
2026	Vernon	Merritt	3/1/2013	4.84	12/7/1977	39	Portland	FT	$101,822

Figure 5.11 Number Formatting

NAMING A TABLE

Each time a table is created, Excel assigns a default name. The default naming convention is similar to the way new workbooks are named (Book1, Book2, etc.), however in this case Excel recognizes the area as a table and will assign the name table instead of book: Table1, Table2, Table3, and so on.

Why name a table range? Referring to the table by name rather than by range will make it easier to refer to a table in the future, for example, in a workbook that contains many tables. Seeing tables

named Jan or Feb is more informational then seeing Table1 or Table 2. You can custom name each table and in the future connect named tables for reporting purposes.

There are two rules to consider when naming tables. One, Excel does not allow spaces in table names, and two, Excel also requires that table names begin with a letter or underscore.

Follow the next step to assign a custom name to the table.

1. Click anywhere in the table and then display the Table Tools Design tab.

   Mac Users: there is no "Table Tools Design" tab in Excel for Mac. Simply click the **Table** tab and follow steps 2 and 3 below to give the table a new name.

2. Click the Table Name text box, in the Properties group.

3. Type **Employee_DB** and then press enter to name the table.

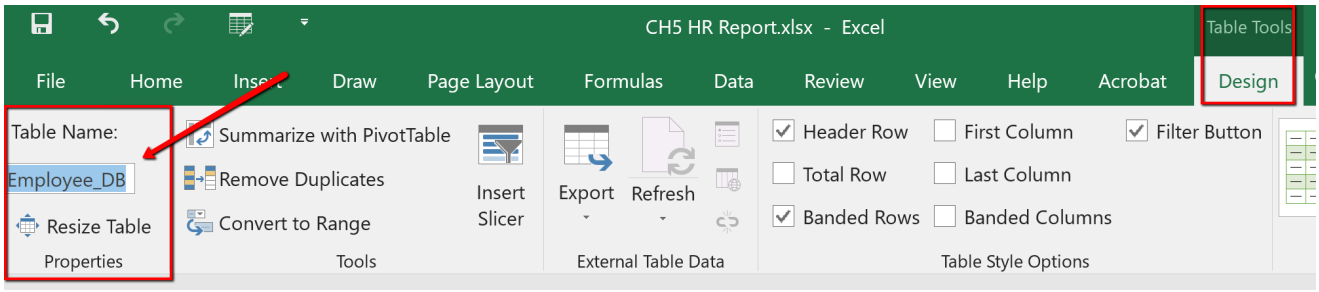


Figure 5.12 Name a Table Range

ENTERING & DELETING RECORDS

Tables require constant updating and may need calculations. When your table needs updating you can add/delete data, by adding/deleting rows, or columns. Excel adjusts the table automatically to the new content. The format applied to the banded rows updates to accommodate the new data set size.

When calculations are needed you can create a calculated column or use the built-in Total Row tool. Excel tables are a fantastic tool for entering formulas efficiently in a calculated column. Excel allows you to enter a single formula in one cell, and then that formula will automatically expand to the rest of the column by itself. There's no need to use the Fill or Copy commands. This feature can be incredibly time-saving, especially if you have a lot of rows. And the same thing happens when you change a formula; the change will also expand to the rest of the calculated column. The Total Row tool, available on the Table Tools Design tab automatically adds a total row to the bottom of the table. To add a new row, uncheck the Total Row checkbox, add the row, and then recheck the

Total Row checkbox. From the total row drop-down, you can select a function, like Average, Count, Count Numbers, Max, Min, Sum, StdDev, Var, and more.

Follow the steps below to update the employee table. You will insert new information just below the table. Data entered in rows or columns adjacent to the table becomes part of the table. Excel will format the new table data automatically.

1. Press and hold the **Ctrl** and **End** button to move to the last record in the table.

   Mac Users: there is no "End" key on most Mac keyboards. Press and hold the **"Command" key a**nd tap the **right arrow key.** Then press and hold the **Command key,** again, and tap the **down arrow key.** That should move to the last record in the table.

2. Click tab to start a new record.

3. Type the new entries below. Click tab to move to the next column.

3297	Alfred	Yelnats	5/29/2015	2.59	2/19/1953	63	Seattle	FT	$95,552
3299	Jackson	Brown	7/15/2013	4	3/16/1953	63	Portland	FT	$98,655

As you enter the data, notice that Excel tries to complete your fields based on previous common entries.

REMOVE DUPLICATES

Duplicate entries may appear in tables. Why? Duplicates sometimes happen when data is entered incorrectly, by more than one person, or from more than one source. The following steps remove duplicate records in the table. In this particular table, Robert Griffin was entered twice by mistake. Delete the duplicate record by following the below steps:

1. Click anywhere in the table.

2. From the Table Tools Design tab click the **Remove Duplicates** button.

   Mac Users: Click the Table tab and click the Remove Duplicates button

3. The Remove Duplicates dialog box will open.

4. If necessary, click the Select All button to deselect all columns.

5. Click **OK** to remove duplicate records from the table.

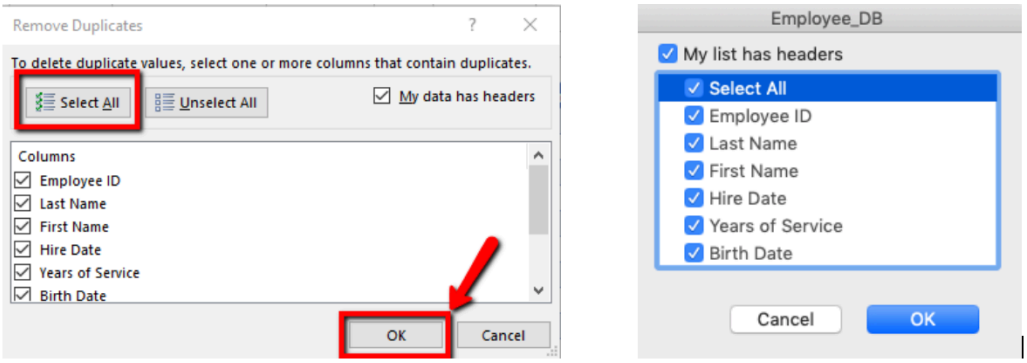


Figure 5.13 Excel for Windows and Excel for Mac Remove Duplicates Dialog Box

6. Excel notifies you that 1 duplicate record was removed.

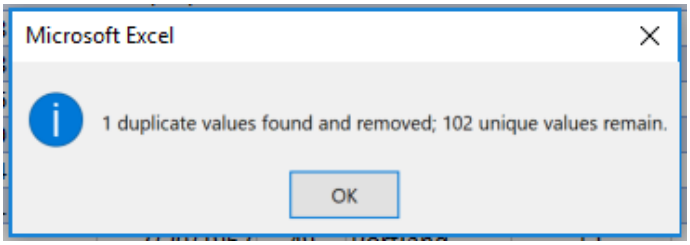


Figure 5.14 Results of Remove Duplicates

CREATE NEW COLUMNS

In this next exercise, we will explore how to add two new columns in the table. Take note, Excel automatically adds the column to the table's range and copies the format of the existing table heading to the new column heading. The first new column will use the VLOOKUP function to determine what cost of living adjustment (COLA) the employee qualifies for based on the region the employee lives in. The second column added will calculate the projected salary increase based on the COLA. When you use a formula in a table it is considered a calculated column.

A calculated column uses a single formula that adjusts for each row and automatically expands to include additional rows in that column. The formula is immediately extended to those rows. You only need to enter a formula to have it automatically filled down to create a calculated column—there's no need to use the Fill or Copy commands.

As mentioned in the previous section, Excel assigns a name to the table, and to each column header in the table. When you add formulas to an Excel table, those names can appear automatically as you enter the formula and select the cell references in the table instead of manually entering them.

As a visual reference compare the differences to a formula entered in a cell, compared to in a table:

Formula – Cell References	Formula – Table: Excel shows field names
=SUM(J6:K6)	=SUM([Current Salary]:[COLA])

Excel displaying table and or field names in a formula is called a structured reference. The names in structured references adjust whenever you add or remove data from the table headings. Structured references also appear when you create a formula outside of an Excel table that references table data. The references can make it easier to locate tables in a large workbook. To include structured references in your formula, use point mode method to click the cells you want to reference instead of typing their cell reference in the formula.

Complete the following steps to enter two new columns to determine each employee's COLA and their projected salaries.

1. Click cell K5, and type **COLA**. Autofit the column width.

2. Click cell L5, and type **Projected Salary Increase**. Autofit the column width.

3. Click cell K6. From the Formulas tab, choose the VLOOKUP function (it is located within the "Lookup and Reference" tool) to look up each employee's **Store** location. Matching their store location to the COLA table, located on the COLA sheet, bring over their percentage of increase listed in the second (2) column of the col_index. Note this is an EXACT match, so eliminate all **FALSE** possibilities in the Range_lookup area:

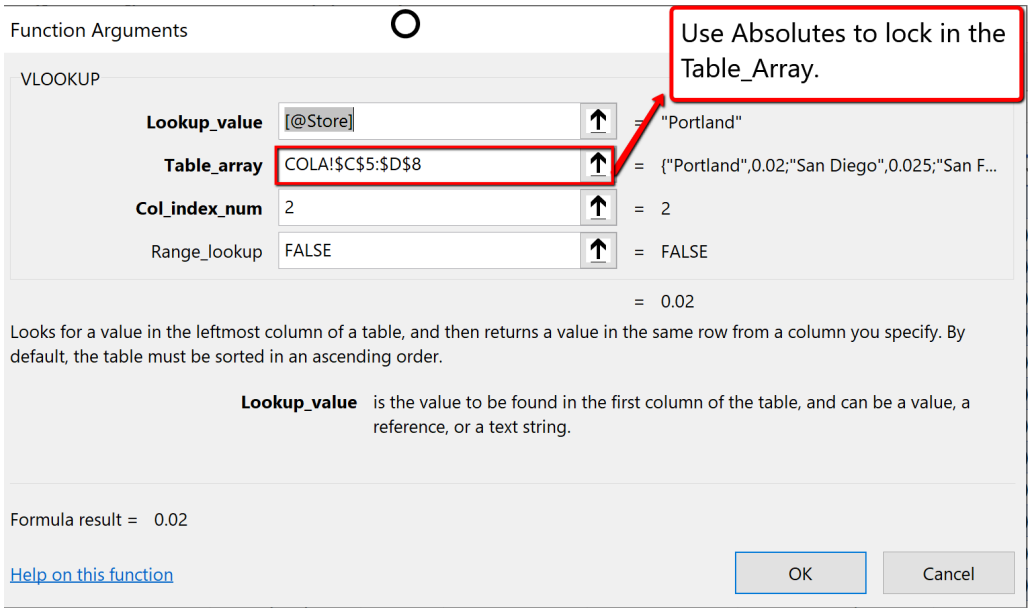


Figure 5.15 COLA VLOOKUP

4. The Excel table will request you to overwrite all cells in the column with the formula. Click the icon, and choose the Overwrite command as shown below:

Mac Users: Excel for Mac will automatically fill in the rest of the cells in the column. You do not have to click the icon. Close the Formula Builder pane.

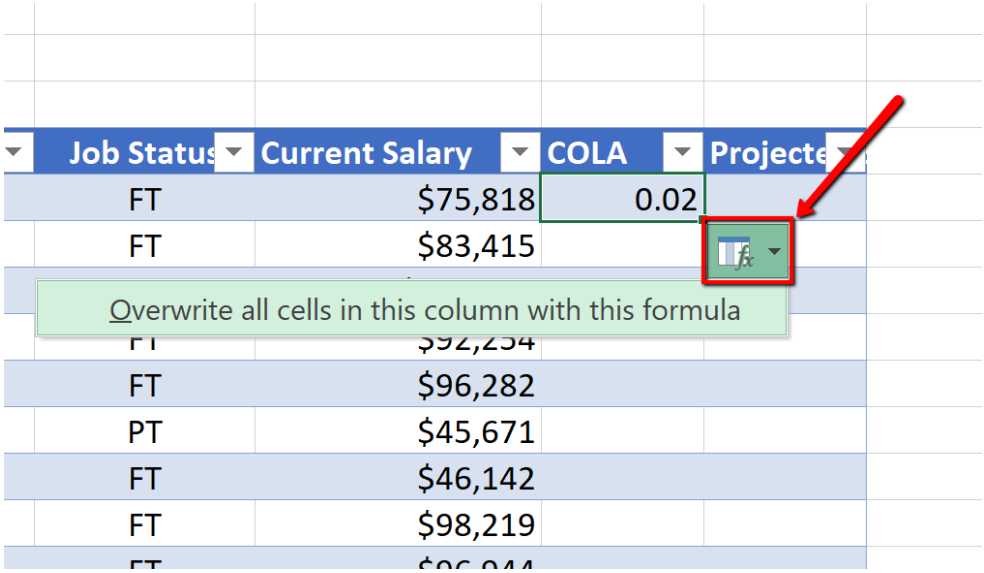


Figure 5.16 Table AutoCorrect Option

5. Using point mode method click the table cells to calculate the employees Projected Salary Increase by multiplying the Current Salary by the COLA increase:

=[@[Current Salary]]*[@COLA]

6. The Excel table will again request you to overwrite all cells in the column with the formula. Click the icon, and choose the Overwrite command.

Mac Users: You do not have to click the icon. Excel for Mac will auto-fill the rest of the cells in the column.

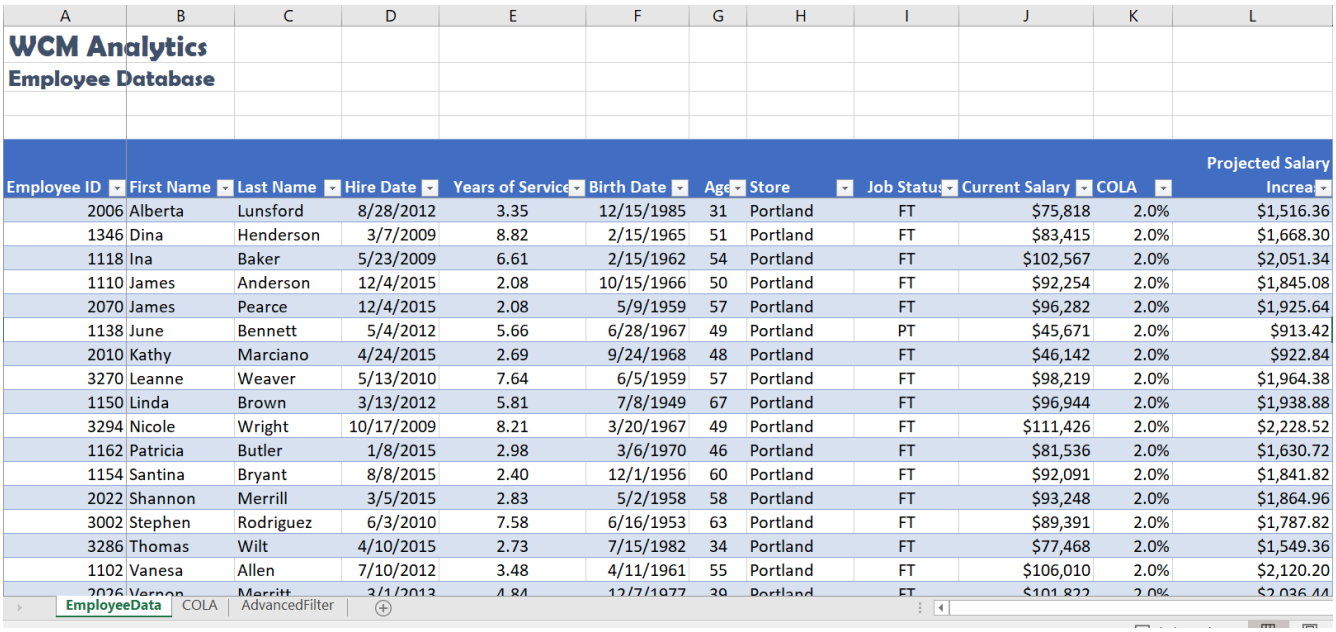
7. Format the COLA and Projected Salary Increase columns by selecting **K6:K107**, and applying the percentage number format, and increase the decimal to one place. Autofit the column widths.

(Suggestion: Use the short cut selection method; click in K6, press and hold the **CTRL** and **SHIFT** and **DOWN** arrow keys to select the column data.)

8. Select **L6:L107**, and apply the Currency number format.

(Suggestion: Use the short cut selection method; click in L6, press and hold the **CTR**L and **SHIFT** and **DOWN** arrow keys to select the column data.)

9. Select **L5.** Wrap, and right-align the text, then decrease the column width, and increase the row height to show the contents of the heading row wrapped on two lines.



WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increa
2006	Alberta	Lunsford	8/28/2012	3.35	12/15/1985	31	Portland	FT	$75,818	2.0%	$1,516.36
1346	Dina	Henderson	3/7/2009	8.82	2/15/1965	51	Portland	FT	$83,415	2.0%	$1,668.30
1118	Ina	Baker	5/23/2009	6.61	2/15/1962	54	Portland	FT	$102,567	2.0%	$2,051.34
1110	James	Anderson	12/4/2015	2.08	10/15/1966	50	Portland	FT	$92,254	2.0%	$1,845.08
2070	James	Pearce	12/4/2015	2.08	5/9/1959	57	Portland	FT	$96,282	2.0%	$1,925.64
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$45,671	2.0%	$913.42
2010	Kathy	Marciano	4/24/2015	2.69	9/24/1968	48	Portland	FT	$46,142	2.0%	$922.84
3270	Leanne	Weaver	5/13/2010	7.64	6/5/1959	57	Portland	FT	$98,219	2.0%	$1,964.38
1150	Linda	Brown	3/13/2012	5.81	7/8/1949	67	Portland	FT	$96,944	2.0%	$1,938.88
3294	Nicole	Wright	10/17/2009	8.21	3/20/1967	49	Portland	FT	$111,426	2.0%	$2,228.52
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$81,536	2.0%	$1,630.72
1154	Santina	Bryant	8/8/2015	2.40	12/1/1956	60	Portland	FT	$92,091	2.0%	$1,841.82
2022	Shannon	Merrill	3/5/2015	2.83	5/2/1958	58	Portland	FT	$93,248	2.0%	$1,864.96
3002	Stephen	Rodriguez	6/3/2010	7.58	6/16/1953	63	Portland	FT	$89,391	2.0%	$1,787.82
3286	Thomas	Wilt	4/10/2015	2.73	7/15/1982	34	Portland	FT	$77,468	2.0%	$1,549.36
1102	Vanesa	Allen	7/10/2012	3.48	4/11/1961	55	Portland	FT	$106,010	2.0%	$2,120.20
2026	Vernon	Merritt	3/1/2013	4.84	12/7/1977	39	Portland	FT	$101,822	2.0%	$2,036.44

EmployeeData | COLA | AdvancedFilter

Figure 5.17 Calculated Columns

TOTAL ROW

A useful table tool for data analysis is the Total Row. You can quickly total data in an Excel table by enabling the **Total Row** option, and then use one of several built-in functions provided in a drop-down list, per column. The Total row, which is added to the end of the table after the last data record can calculate summary statistics, including the average, sum, minimum, and maximum of select fields within the table. The Total row is formatted with values displayed in bold, the double border line option is separating the data records from the Total row.

Apply a Total Row, and follow the below steps to sum three columns of data:

1. Click anywhere in the table and choose the Table Tools Design tab, and click on the Total Row option.

Mac Users: just click the Table tab and click on the Total Row option

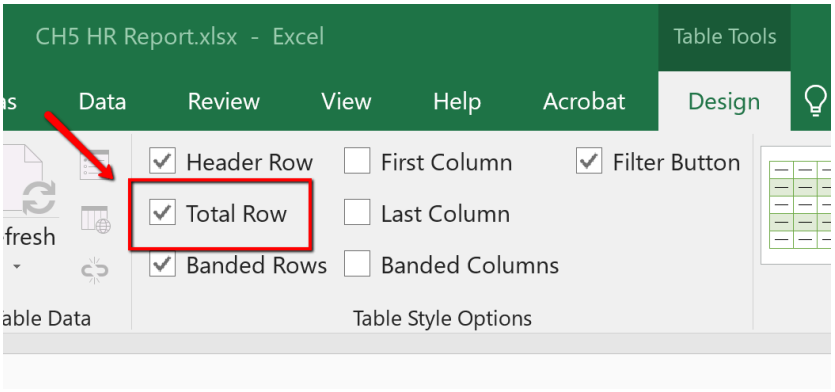
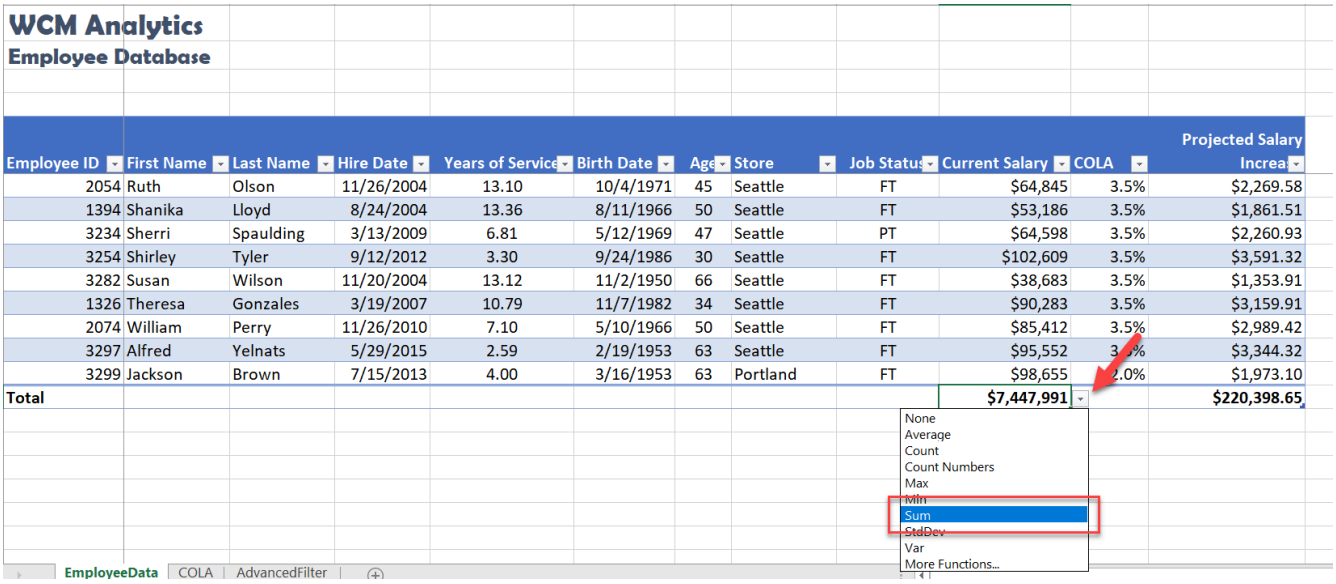


Figure 5.18 Total Row

2. Excel redirects you to the bottom of the table to view the total row, where a SUM defaulted in the Projected Salary Increase column. Click cell **J108**, select choose the Total Row menu arrow. Choose **SUM** to total the Current Salary column.



WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increa
2054	Ruth	Olson	11/26/2004	13.10	10/4/1971	45	Seattle	FT	$64,845	3.5%	$2,269.58
1394	Shanika	Lloyd	8/24/2004	13.36	8/11/1966	50	Seattle	FT	$53,186	3.5%	$1,861.51
3234	Sherri	Spaulding	3/13/2009	6.81	5/12/1969	47	Seattle	PT	$64,598	3.5%	$2,260.93
3254	Shirley	Tyler	9/12/2012	3.30	9/24/1986	30	Seattle	FT	$102,609	3.5%	$3,591.32
3282	Susan	Wilson	11/20/2004	13.12	11/2/1950	66	Seattle	FT	$38,683	3.5%	$1,353.91
1326	Theresa	Gonzales	3/19/2007	10.79	11/7/1982	34	Seattle	FT	$90,283	3.5%	$3,159.91
2074	William	Perry	11/26/2010	7.10	5/10/1966	50	Seattle	FT	$85,412	3.5%	$2,989.42
3297	Alfred	Yelnats	5/29/2015	2.59	2/19/1953	63	Seattle	FT	$95,552	3.5%	$3,344.32
3299	Jackson	Brown	7/15/2013	4.00	3/16/1953	63	Portland	FT	$98,655	2.0%	$1,973.10
Total									$7,447,991		$220,398.65

None
Average
Count
Count Numbers
Max
Min
Sum
StdDev
Var
More Functions...

EmployeeData | COLA | AdvancedFilter

Figure 5.19 Total Row, Current Salary Column, Sum Function

3. Click cell **K108**, from the total row menu select Average. The average COLA increase will display.

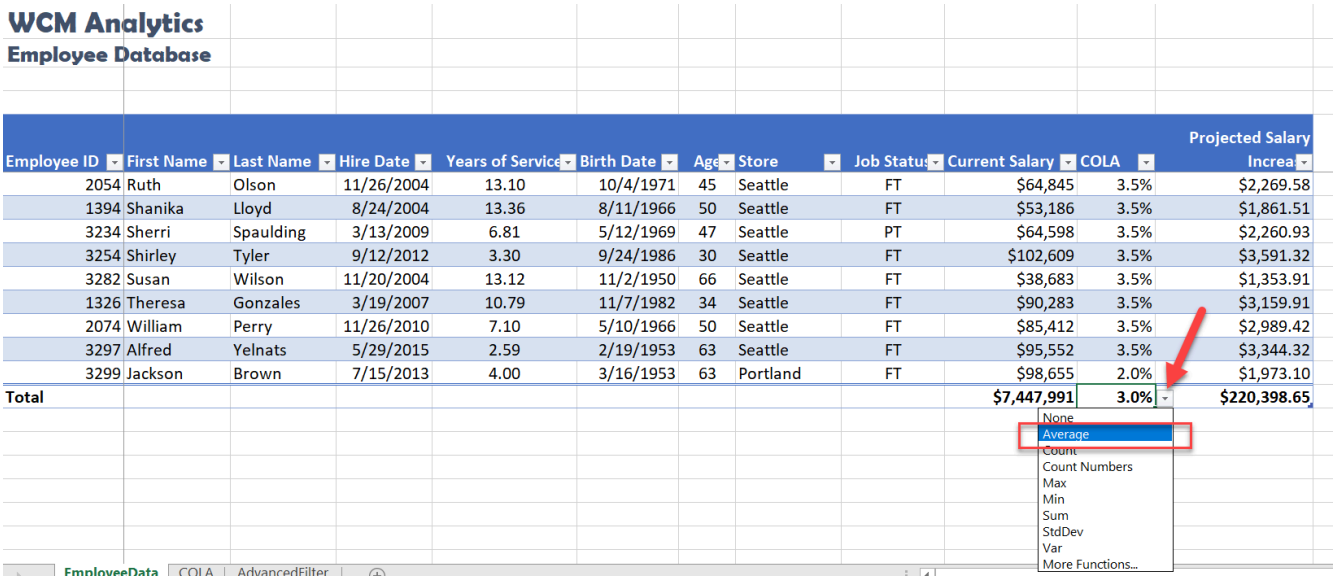


Figure 5.20 Total Row, COLA Column, Average Function

CENTER ACROSS SELECTION

Follow the below steps to center the title in cell A1:L2 using the Center Across Selection tool located in the Format Cells dialog box. In prior chapters, we used the 'Merge & Center' button to center text across a range. The Merge & Center tool centers the title but removes access to individual cells. This restriction can present a problem when trying to autofit column widths in a table. The Center Across Selection format centers text across multiple cells but does not merge the selected cell range into one cell making it a better formatting choice when working with tables.

1. Select cell **A1:L2,** and right-click to access the short cut menu.

   Mac Users: hold down **CTRL key** and click the selected cells to access the short cut menu

2. Choose Format Cells.

3. In the Format Cells dialogue box, choose the Alignment tab.

4. From the Horizontal alignment menu, choose **Center Across Selection**. Click **OK** to return to the table.

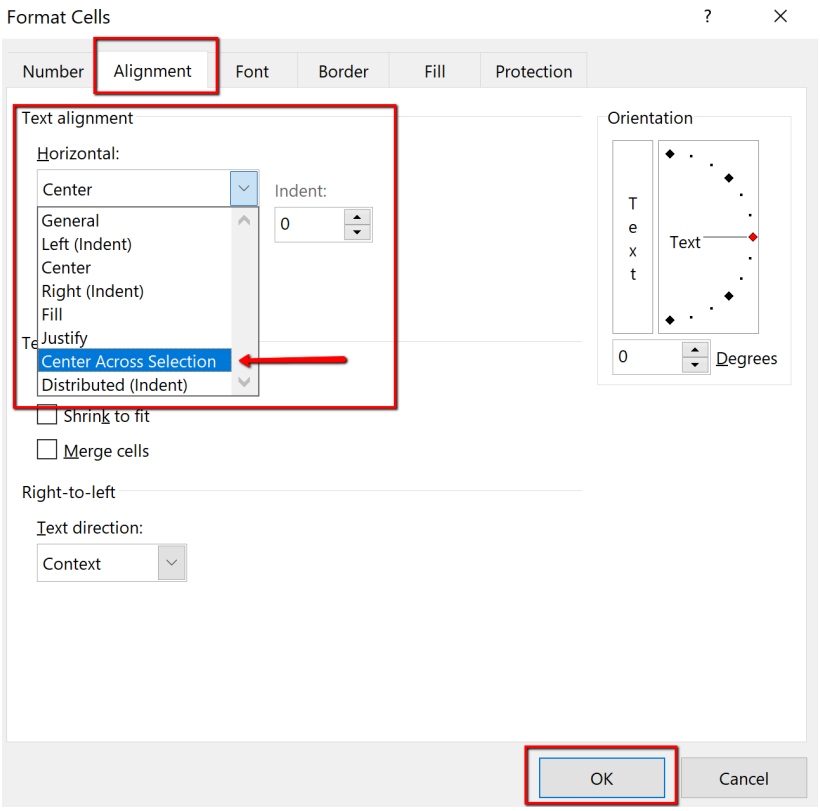


Figure 5.21 Format Cells Dialogue Box

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increa
2006	Alberta	Lunsford	8/28/2012	3.35	12/15/1985	31	Portland	FT	$75,818	2.0%	$1,516.36
1346	Dina	Henderson	3/7/2009	8.82	2/15/1965	51	Portland	FT	$83,415	2.0%	$1,668.30
1118	Ina	Baker	5/23/2009	6.61	2/15/1962	54	Portland	FT	$102,567	2.0%	$2,051.34
1110	James	Anderson	12/4/2015	2.08	10/15/1966	50	Portland	FT	$92,254	2.0%	$1,845.08
2070	James	Pearce	12/4/2015	2.08	5/9/1959	57	Portland	FT	$96,282	2.0%	$1,925.64
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$45,671	2.0%	$913.42
2010	Kathy	Marciano	4/24/2015	2.69	9/24/1968	48	Portland	FT	$46,142	2.0%	$922.84
3270	Leanne	Weaver	5/13/2010	7.64	6/5/1959	57	Portland	FT	$98,219	2.0%	$1,964.38
1150	Linda	Brown	3/13/2012	5.81	7/8/1949	67	Portland	FT	$96,944	2.0%	$1,938.88
3294	Nicole	Wright	10/17/2009	8.21	3/20/1967	49	Portland	FT	$111,426	2.0%	$2,228.52
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$81,536	2.0%	$1,630.72
1154	Santina	Bryant	8/8/2015	2.40	12/1/1956	60	Portland	FT	$92,091	2.0%	$1,841.82
2022	Shannon	Merrill	3/5/2015	2.83	5/2/1958	58	Portland	FT	$93,248	2.0%	$1,864.96
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3286	Thomas	Wilt	4/10/2015	2.73	7/15/1982	34	Portland	FT	$77,468	2.0%	$1,549.36
1102	Vanesa	Allen	7/10/2012	3.48	4/11/1961	55	Portland	FT	$106,010	2.0%	$2,120.20

Figure 5.22 Center Across Selection

ATTRIBUTION

5.2 Intermediate Table Skills

Learning Objectives

- Sort table data.
- Custom Sort table data.
- Apply Custom List sort options.
- Filter table data using criteria filters.
- Use the Advanced Filter option to filter table data.
- Analyze data with PivotTables & Subtotals.

INTERMEDIATE TABLE SKILLS

SORT, FILTER, AND ANALYZE DATA WITH PIVOT TABLES & SUBTOTALS

SORTING

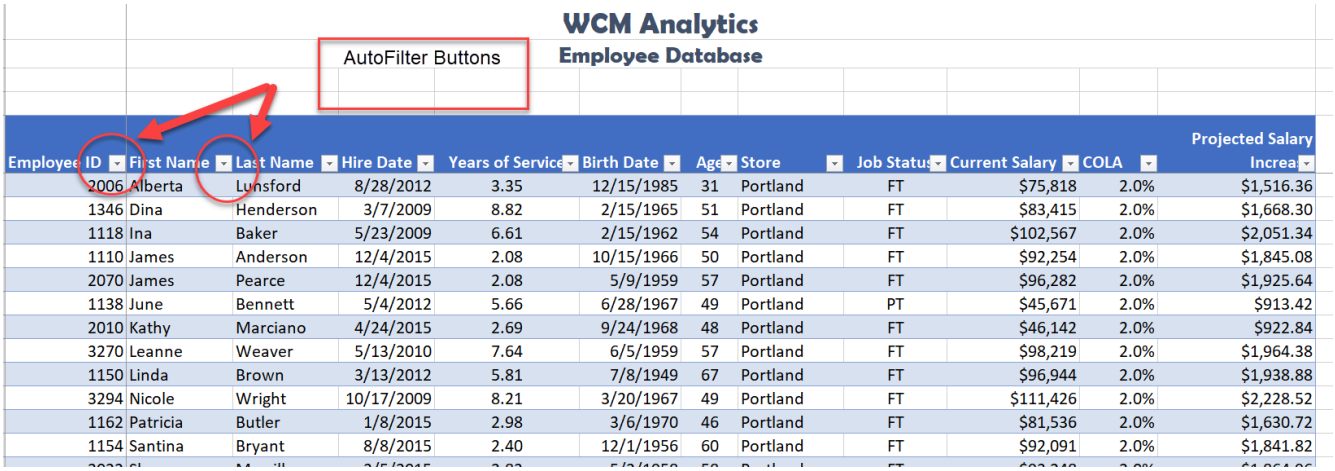
Sorting is one of the most common tools for data management. By arranging data sequentially the information becomes more meaningful. Arranging records in a specific sequence is called sorting. If you sort by one column this is considered a single sort. If you need to sort by more than one column, this is considered a custom sort.

The field or fields you select to sort are called sort keys. In Excel, you can sort your table by ascending or descending order. Data in ascending order appears lowest to highest, earliest to most recent, or alphabetically from A to Z. Data in descending order in arranged by highest to lowest, most recent to earliest, or alphabetically from Z to A.

Excel will sort a range of data that is not in a table. However, when working with large sets of information it is wise to make the data a table for integrity. Excel locks the row of information creating a record, thus when sorted, the record remains intact, just reorganized. For example, when you sort the table by last name, all of the records in each row move together. It is always a good idea to save a copy of your worksheet before applying sorts.

There are multiple places you can find and use sorting tools:

- When you first create a table, Excel automatically enables AutoFilter buttons; a tool used to sort, query, and filter the records in a table. The filter buttons appear to the right of the column headings. When you click the filter button sorting options appear on the menu options.



Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increa
2006	Alberta	Lunsford	8/28/2012	3.35	12/15/1985	31	Portland	FT	$75,818	2.0%	$1,516.36
1346	Dina	Henderson	3/7/2009	8.82	2/15/1965	51	Portland	FT	$83,415	2.0%	$1,668.30
1118	Ina	Baker	5/23/2009	6.61	2/15/1962	54	Portland	FT	$102,567	2.0%	$2,051.34
1110	James	Anderson	12/4/2015	2.08	10/15/1966	50	Portland	FT	$92,254	2.0%	$1,845.08
2070	James	Pearce	12/4/2015	2.08	5/9/1959	57	Portland	FT	$96,282	2.0%	$1,925.64
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$45,671	2.0%	$913.42
2010	Kathy	Marciano	4/24/2015	2.69	9/24/1968	48	Portland	FT	$46,142	2.0%	$922.84
3270	Leanne	Weaver	5/13/2010	7.64	6/5/1959	57	Portland	FT	$98,219	2.0%	$1,964.38
1150	Linda	Brown	3/13/2012	5.81	7/8/1949	67	Portland	FT	$96,944	2.0%	$1,938.88
3294	Nicole	Wright	10/17/2009	8.21	3/20/1967	49	Portland	FT	$111,426	2.0%	$2,228.52
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$81,536	2.0%	$1,630.72
1154	Santina	Bryant	8/8/2015	2.40	12/1/1956	60	Portland	FT	$92,091	2.0%	$1,841.82

Figure 5.23 AutoFilter Buttons

- From the Home tab, in the Editing group, click the 'Sort & Filter' button, and then click one of the sorting options on the Sort & Filter menu.

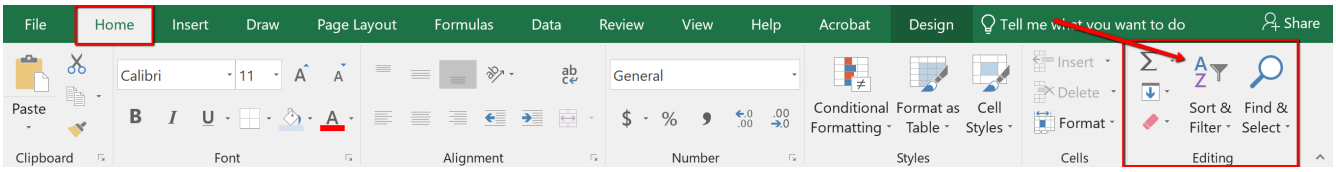


Figure 5.24 Sort and Filter Menu

- From the Data tab, use the 'Sort A to Z' or 'Sort Z to A' buttons or for multiple levels select the Sort button to open the Custom Sort dialogue.

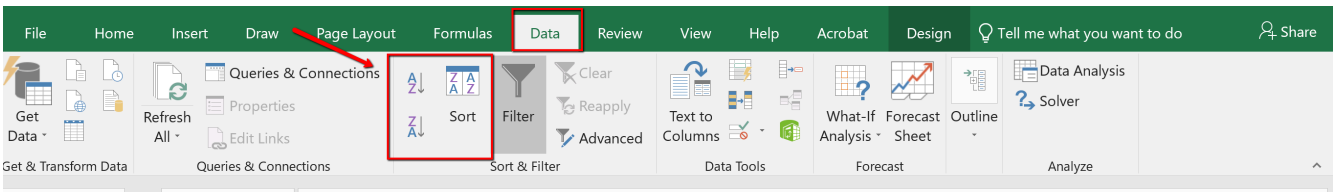


Figure 5.25 Data Tab Sort options

- Right-click anywhere in a table and then point to Sort on the shortcut menu to display the Sort sub-menu.

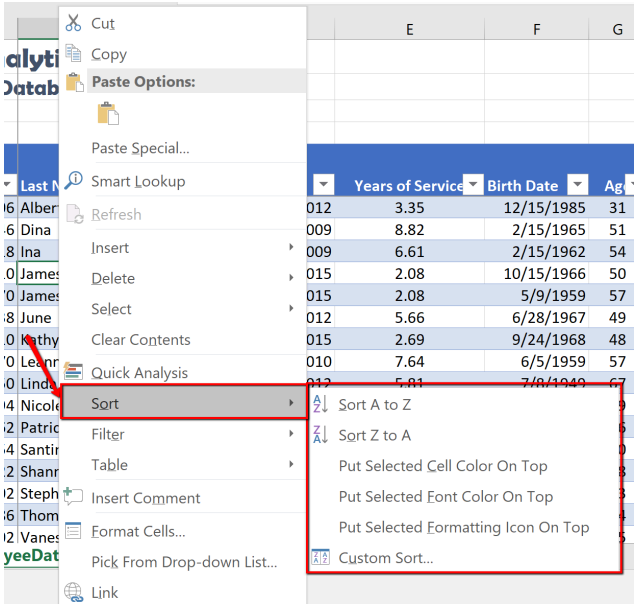
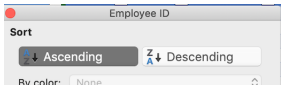


Figure 5.26 Right-Click Menu

Complete a single level sort by following the steps:

1. In the EmployeeID heading, click the filter button.
2. Choose to Sort Smallest to Largest.

Mac Users: Click the A-Z Ascending button 

Notice Excel arranges in chronological order all the employee data based on the EmployeeID number, however keeping each record together. You will also notice the filter button now displays an up arrow denoting an ascending sort.

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increa
1102	Vanessa	Allen	7/10/2012	3.48	4/11/1961	55	Portland	FT	$106,010	2.0%	$2,120.20
1106	Elizabeth	Allen	11/6/2015	2.15	11/23/1991	25	Seattle	FT	$42,182	3.5%	$1,476.37
1110	James	Anderson	12/4/2015	2.08	10/15/1966	50	Portland	FT	$92,254	2.0%	$1,845.08
1114	Katherine	Baker	3/24/2003	14.78	12/8/1964	52	Seattle	FT	$69,250	3.5%	$2,423.75
1118	Ina	Baker	5/23/2009	6.61	2/15/1962	54	Portland	FT	$102,567	2.0%	$2,051.34
1122	Brandon	Barnes	8/12/2002	15.40	10/15/1968	48	San Francisco	FT	$94,517	3.0%	$2,835.51
1126	Paul	Benham	11/6/2015	2.15	3/20/1973	43	San Diego	FT	$51,791	2.5%	$1,294.78
1130	Santos	Bennett	6/10/2010	7.56	4/20/1966	50	San Diego	FT	$32,530	2.5%	$813.25
1134	James	Bennett	1/20/2016	1.95	3/21/1957	59	Seattle	FT	$94,502	3.5%	$3,307.57
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$45,671	2.0%	$913.42
1142	Gregory	Blackshear	7/16/2009	6.47	2/8/1986	30	Seattle	FT	$70,346	3.5%	$2,462.11
1146	Thomas	Bradley	4/12/2008	9.73	7/13/1986	30	San Diego	FT	$34,685	2.5%	$867.13
1150	Linda	Brown	3/13/2012	5.81	7/8/1949	67	Portland	FT	$96,944	2.0%	$1,938.88
1154	Santina	Bryant	8/8/2015	2.40	12/1/1956	60	Portland	FT	$92,091	2.0%	$1,841.82
1158	Charlotte	Burgess	7/17/2015	2.46	7/12/1959	57	San Diego	FT	$30,150	2.5%	$753.75
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$81,536	2.0%	$1,630.72
1166	Ramon	Cannon	10/4/2013	4.24	10/25/1959	57	San Francisco	FT	$96,921	2.0%	$2,880.63

Figure 5.27 EmployeeID Sort

The following steps will sort the records in descending order by Current Salary using the 'Sort Largest to Smallest' option form the filter button.

1. Click the filter button located in the Current Salary heading.
2. Choose Sort Largest to Smallest option from the menu.

    Mac Users: click the "**Descending**" button

Notice the original sort has been overridden, and the information is now organized based on the largest Current Salary. You will see the small arrow on the EmployeeID filter is gone, and an arrow pointing down for Descending Order is visible on the Current Salary filter button.

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increase
2038	Maria	Montoya	6/12/2009	8.56	1/30/1942	74	San Diego	FT	$24,373	2.5%	$609.33
1158	Charlotte	Burgess	7/17/2015	2.46	7/12/1959	57	San Diego	FT	$30,150	2.5%	$753.75
1130	Santos	Bennett	6/10/2010	7.56	4/20/1966	50	San Diego	FT	$32,530	2.5%	$813.25
1146	Thomas	Bradley	4/12/2008	9.73	7/13/1986	30	San Diego	FT	$34,685	2.5%	$867.13
1318	Robert	George	8/28/2015	2.35	11/24/1951	65	Seattle	FT	$35,304	3.5%	$1,235.64
3210	Robert	Rosenberg	8/2/2010	7.42	7/26/1962	54	San Diego	FT	$36,671	2.5%	$916.78
3218	Marc	Sanchez	11/5/2007	10.16	5/31/1951	65	San Diego	FT	$37,090	2.5%	$927.25
1358	Douglas	James	6/7/2015	2.57	5/8/1976	40	San Diego	FT	$38,083	2.5%	$952.08
2030	Elizabeth	Miller	12/8/2015	2.07	12/4/1961	55	Seattle	FT	$38,420	3.5%	$1,344.70
3282	Susan	Wilson	11/20/2004	13.12	11/2/1950	66	Seattle	FT	$38,683	3.5%	$1,353.91
1334	Maudie	Guerrero	8/28/2015	2.35	2/5/1976	40	San Francisco	FT	$39,545	3.0%	$1,186.35
3274	Jason	Web	11/26/2013	4.10	3/2/1955	61	Seattle	PT	$41,204	3.5%	$1,442.14
1106	Elizabeth	Allen	11/6/2015	2.15	11/23/1991	25	Seattle	FT	$42,182	3.5%	$1,476.37
1378	Brenda	Jung	2/12/2010	7.89	7/12/1974	42	Seattle	FT	$42,664	3.5%	$1,493.24

Figure 5.28 Current Salary Sort

Skill Refreshed

Sort a Column

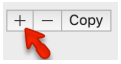
1. Click on the filter Click arrow to the right of the header in the column you want to sort.
2. Click on the choice AZ↑ or ZA↓ to sort your data by that column.

CUSTOM SORT

When you need to sort by more than one level, you must use the Custom Sort option. Complete the following steps to organize the data by Store, Last Name, Current Salary, all in Ascending Order (A-Z).

1. Select the Data tab, and click the Sort button. Notice the last column sorted by is listed. Change the column heading name by dropping down the **Sort by** menu and select **Store.**

2. Click Add Level.

Mac Users: click the + symbol 

3. Click the down arrow in the **Then by** section, and choose the column heading names **as shown below in Figure 5.29**. Note to click Add Level to add the next column heading. The order you select the headings will determine how the table information is sorted.

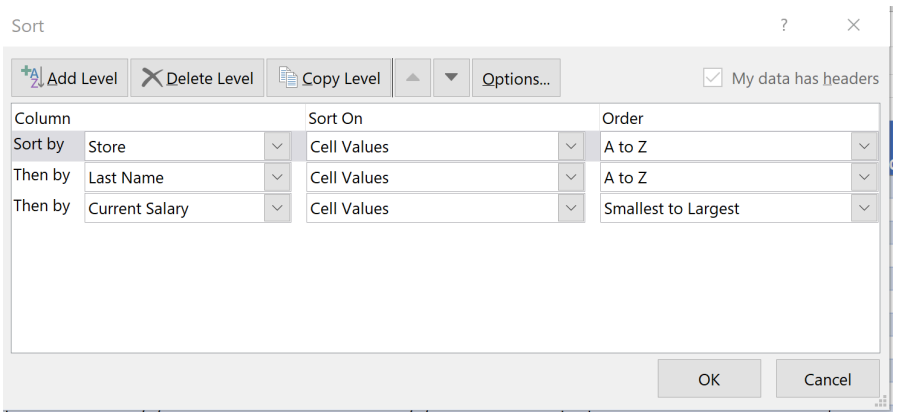


Figure 5.29 Sort Dialogue Box

4. Once you select to Sort by column headings, choose the Order by selecting to sort in ascending order (A-Z) for the Store and Last name fields, and Smallest to Largest, for the Current Salary field.

5. Click OK.

Notice the information is now sorted by three levels, per **Store**, each employee is organized by **Last Name**, and **Current Salary** in ascending order (smallest to largest). Each of the filter buttons indicates the sort with the up arrow.

WCM Analytics
Employee Database

Per store, employees are organized by Last Name, and Current Salary.

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increas
1102	Vanesa	Allen	7/10/2012	3.48	4/11/1961	55	Portland	FT	$106,010	2.0%	$2,120.20
1110	James	Anderson	12/4/2015	2.08	10/15/1966	50	Portland	FT	$92,254	2.0%	$1,845.08
1118	Ina	Baker	5/23/2009	6.61	2/15/1962	54	Portland	FT	$102,567	2.0%	$2,051.34
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$45,671	2.0%	$913.42
1150	Linda	Brown	3/13/2012	5.81	7/8/1949	67	Portland	FT	$96,944	2.0%	$1,938.88
3299	Jackson	Brown	7/15/2013	4.00	3/16/1953	63	Portland	FT	$98,655	2.0%	$1,973.10
1154	Santina	Bryant	8/8/2015	2.40	12/1/1956	60	Portland	FT	$92,091	2.0%	$1,841.82
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$81,536	2.0%	$1,630.72
1346	Dina	Henderson	3/7/2009	8.82	2/15/1965	51	Portland	FT	$83,415	2.0%	$1,668.30
2006	Alberta	Lunsford	8/28/2012	3.35	12/15/1985	31	Portland	FT	$75,818	2.0%	$1,516.36
2010	Kathy	Marciano	4/24/2015	2.69	9/24/1968	48	Portland	FT	$46,142	2.0%	$922.84
2022	Shannon	Merrill	3/5/2015	2.83	5/2/1958	58	Portland	FT	$93,248	2.0%	$1,864.96
2026	Vernon	Merritt	3/1/2013	4.84	12/7/1977	39	Portland	FT	$101,822	2.0%	$2,036.44
2070	James	Pearce	12/4/2015	2.08	5/9/1959	57	Portland	FT	$96,282	2.0%	$1,925.64
3002	Stephen	Rodriguez	6/3/2010	7.58	6/16/1953	63	Portland	FT	$89,391	2.0%	$1,787.82

EmployeeData | COLA | AdvancedFilter

Figure 5.30 Custom Sort Visual

Skill Refresher

Custom Sort (Multiple Level Sort)

1. Select the Data tab, and click the Sort button.
2. Choose Add Level.
3. Click the down arrow in the Column field and choose the column heading to sort by.
4. Repeat the above steps to add another level and select the next column heading to sort by.
5. The order you select the headings will determine how the table information is sorted.

CUSTOM LIST SORT

When sorting you can create custom lists that allow sorting by characteristics that do not sort alphabetically. Example, text items such as high, medium, and low—or S, M, L, XL. Dates commonly require custom lists so you can vary in the way data is sorted by days of the week or months of the year.

In our case, we want to create a custom list that sorts our stores, which is not, in ascending or descending order. The human resources office likes to order the stores based on the location size. The company headquarters is in Seattle and employs the most people. The next biggest location is San Diego etc. Follow the below steps to create a custom list ordering the stores as shown below:

Seattle

San Diego

Portland

San Francisco

Mac Users: The steps to create a **custom sort list are different for Excel for Mac. Please skip the below steps and follow the alternate steps below Figure 5.34.**

Follow the below steps to create a custom list ordering:

1. While clicked in the table, choose the Data tab and click the **Sort** button.
2. In the Sort by row, click the drop-down menu in the Order Column for the **Store** heading. Choose **Custom List**.

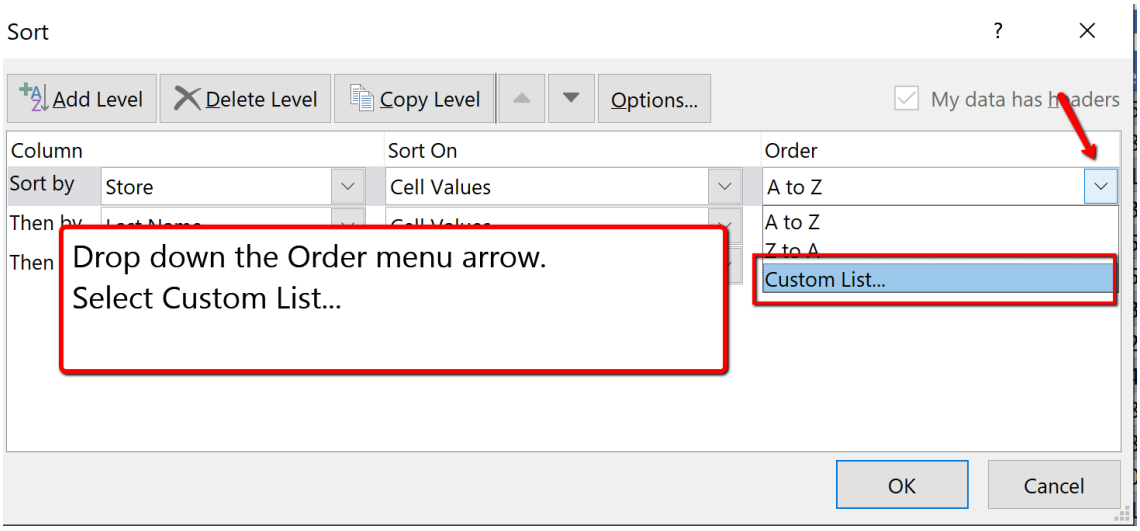


Figure 5.31 Custom List Dialogue Box

3. Click in the **List entries:** box and type **Seattle**, and press enter. Type the remainder of the locations shown in Figure 5.32, pressing enter after each store location typed. Once all locations are entered, click **Add**. Then choose **Ok**.

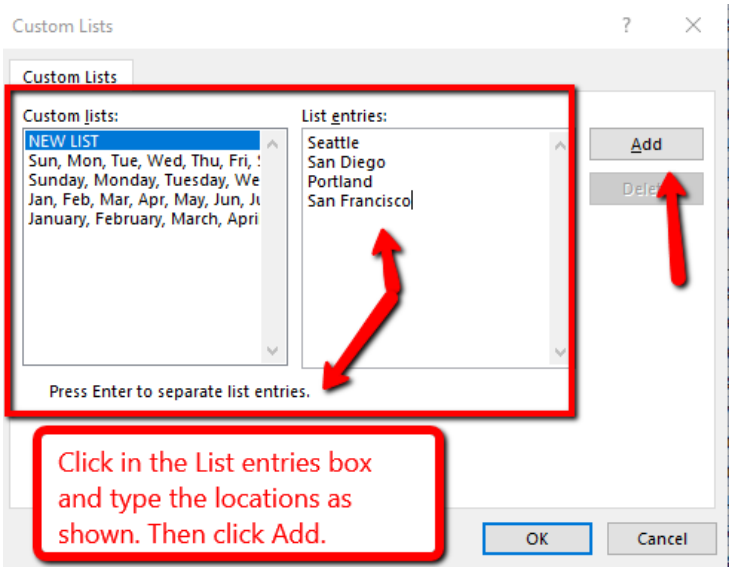


Figure 5.32 Custom List Entries dialogue box

4. You will see the Order of the Store sort update. Click **OK** to close the Sort dialogue box.

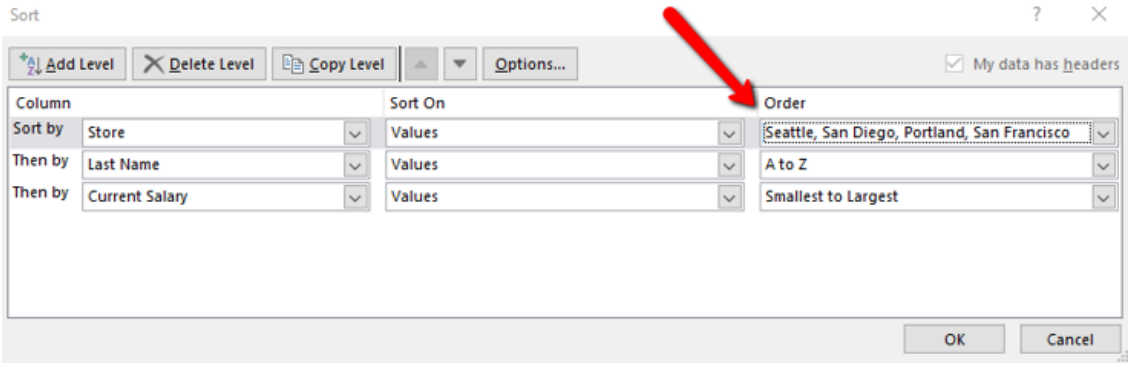


Figure 5.33 Sort_Dialogue Box Custom List Order

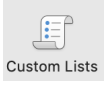
The custom sort is applied and the table is now sorted by Store, using the custom order, then the Last Name of the employee and then by the Current Salary column.

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increas
1106	Elizabeth	Allen	11/6/2015	2.15	11/23/1991	25	Seattle	FT	$42,182	3.5%	$1,476.37
1114	Katherine	Baker	3/24/2003	14.78	12/8/1964	52	Seattle	FT	$69,250	3.5%	$2,423.75
1134	James	Bennett	1/20/2016	1.95	3/21/1957	59	Seattle	FT	$94,502	3.5%	$3,307.57
1142	Gregory	Blackshear	7/16/2009	6.47	2/8/1986	30	Seattle	FT	$70,346	3.5%	$2,462.11
1174	Jason	Chavez	8/7/2012	3.40	10/28/1956	60	Seattle	FT	$76,947	3.5%	$2,693.15
1178	Eva	Cook	5/29/2015	2.59	8/21/1950	66	Seattle	FT	$96,449	3.5%	$3,375.72
1190	Carla	Davis	1/8/2004	13.99	12/23/1991	25	Seattle	FT	$94,346	3.5%	$3,302.11
1186	Michael	Davis	1/1/2016	2.00	6/10/1966	50	Seattle	FT	$96,960	3.5%	$3,393.60
1194	Larry	Diaz	4/20/2007	10.71	6/30/1956	60	Seattle	FT	$94,441	3.5%	$3,305.44
1198	Robert	Dunton	6/15/2007	10.55	9/29/1950	66	Seattle	FT	$90,338	3.5%	$3,161.83
1302	Martin	Elamin	6/15/2012	5.55	7/31/1963	53	Seattle	PT	$49,890	3.5%	$1,746.15
1306	Erin	Erwin	7/10/2015	2.48	5/5/1960	56	Seattle	FT	$68,681	3.5%	$2,403.84
1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,244	3.5%	$1,828.54
1314	Bobbi	Floyd	10/16/2015	2.21	7/15/1984	32	Seattle	FT	$92,221	3.5%	$3,227.74

Figure 5.34 Custom List Sort Visual

Mac Users alternate steps for creating a custom sort list:

1. Click the **Excel** menu option and choose **Preferences**
2. Click on the **Custom List** button 

3. Type the list of cities in the "List entries" box as shown in **Figure 5.32 above** then click the **Add** button and close the Custom List dialog box
4. Click anywhere in the table, and then click the **Data tab** and click the **Sort** button
5. Click the drop-down menu in the **Order** Column for the **Store** heading. Choose **Custom List**

6. Click on the custom list of cities that you just created and then click the **OK button twice**
7. The custom sort is applied and the table is now sorted by Store, using the custom order, then the Last Name of the employee and then by the Current Salary column. See **Figure 5.34 above.**

Skill Refresher

Custom List Sort

1. Select the Data tab, and click the Sort button.
2. Click the drop-down menu in the Order Column of the field needing a custom list created.
3. Choose Custom List.
4. Click in the List entries box and type the custom list desired.
5. Then click Add.
6. Click Ok.

FILTER DATA

If your worksheet contains a lot of data, it can be difficult to find information quickly. Applying **Filters** is an efficient and effective way to only show the information needed. Typically when filtering you are searching the data for specific information. Generally speaking, you are searching the data based on a question, or in other words, querying the data, and returning only the information that satisfies the question. The process of filtering records based on one or more filter criteria is called a query. Filtering data hides the rows whose values do not match the search criteria. The information that does not display is not deleted, it is just hidden, and will be redisplayed by removing the filter or applying a new filter.

Like sorting, Filter options are located in the filter button alongside each field name. By clicking the filter button, you can choose which values in that field to display, hiding the rows or records that do not match that value. The filter lets you choose to display only those records that meet specified criteria such as color, number, or text. In this situation, criteria is defined as; a logical rule by which data is tested and chosen.

For example, you can filter the table to display a specific name or item by typing it in a Search box. The name you selected acts as the criterion for filtering the table, which results in Excel displaying only those records that match the criterion. The selected checkboxes indicate which items will appear in the table. By default, all of the items are selected. If you deselect an item from the filter menu, it is removed from the filter criterion. Excel will not display any record that contains the unchecked item. As with the previous sort techniques, you can include more than one column

when you filter by clicking a second filter button and making choices. After you filter data, you can copy, find, edit, format, chart, or print the filtered data without rearranging or moving it.

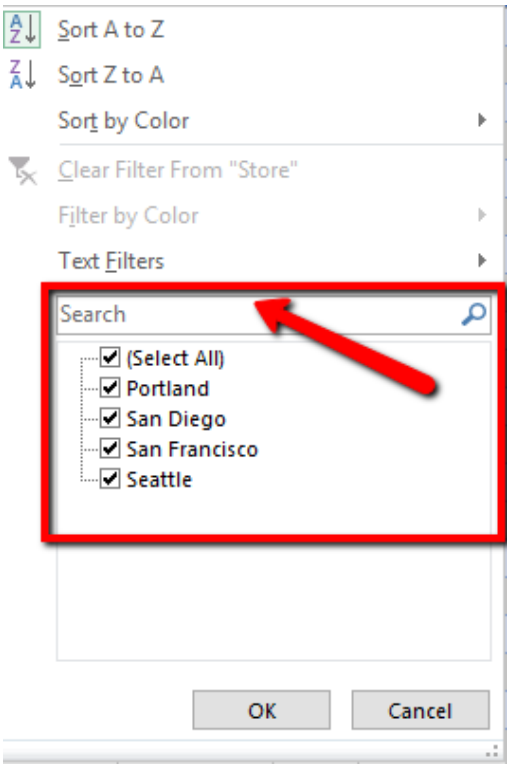


Figure 5.35 Filter Search Menu

Complete the following steps and filter data according to each query.

How many employees are at a Part-Time (PT) status?

1. Click the filter button on the **Job Status** column heading.
2. Click **Select All**, to deselect options.
3. Click the **PT** box to only display the part-time employees.
4. From the total row, in cell **I108**, choose the **Count function** count the number of employees at a PT status.

The answer to the question is there are currently are 11 employees at a PT time status. The total row will display the part-time total current salaries, and what the projected salary increase for part-time help will be after COLA adjustments.

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increas
2034	Billy	Miller	8/11/2009	6.39	1/10/1959	57	Seattle	PT	$53,582	3.5%	$1,875.37
3234	Sherri	Spaulding	3/13/2009	6.81	5/12/1969	47	Seattle	PT	$64,598	3.5%	$2,260.93
3274	Jason	Web	11/26/2013	4.10	3/2/1955	61	Seattle	PT	$41,204	3.5%	$1,442.14
1330	Robert	Griffin	3/11/2010	7.81	3/3/1958	58	San Diego	PT	$45,657	2.5%	$1,141.43
3222	Mary	Smith	7/17/2015	2.46	10/15/1984	32	San Diego	PT	$51,639	2.5%	$1,290.98
1138	June	Bennett	5/4/2012	5.66	6/28/1967	49	Portland	PT	$45,671	2.0%	$913.42
2090	James	Price	11/27/2012	3.10	6/8/1952	64	San Francisco	PT	$64,826	3.0%	$1,944.78
3278	Jeffery	Whiting	8/25/2004	13.36	5/13/1964	52	San Francisco	PT	$65,978	3.0%	$1,979.34
3280	Jennifer	Wiliams	9/6/2008	9.32	6/26/1967	49	San Francisco	PT	$96,354	3.0%	$2,890.62
Total								**11**	**$628,997**	**3.0%**	**$19,221.08**

Figure 5.36 PT Filter Visual

USING CRITERIA FILTERS

The filters created are limited to selecting records for fields matching a specific value or set of values. For more general criteria, you can use criteria filters, which are expression involving dates and times, numeric values, and text strings. Excel will identify what criteria filter to display based on the information in the column. For example, you can filter the employee data to show only those employees hired within a specific date range. Notice the criteria filter changes to **Date Filters.** If we were looking at the Current Salary column, the filter would be a Numbers Filter.

Using criteria filters, follow the below steps to search for employees who have been with the company for a specific time period.

Identify employees who have been with the company between 2013-2016.

1. While clicked in the table, clear any sort or filter applied by clicking the Data tab. In the Sort & Filter group choose the **Clear** button. 

2. Click the Filter button in the **Hire Date** column. Select Date Filters, and choose the Between criteria.

 **Mac Users:** uncheck the **Select All** checkbox **before** choosing the **Between** option.

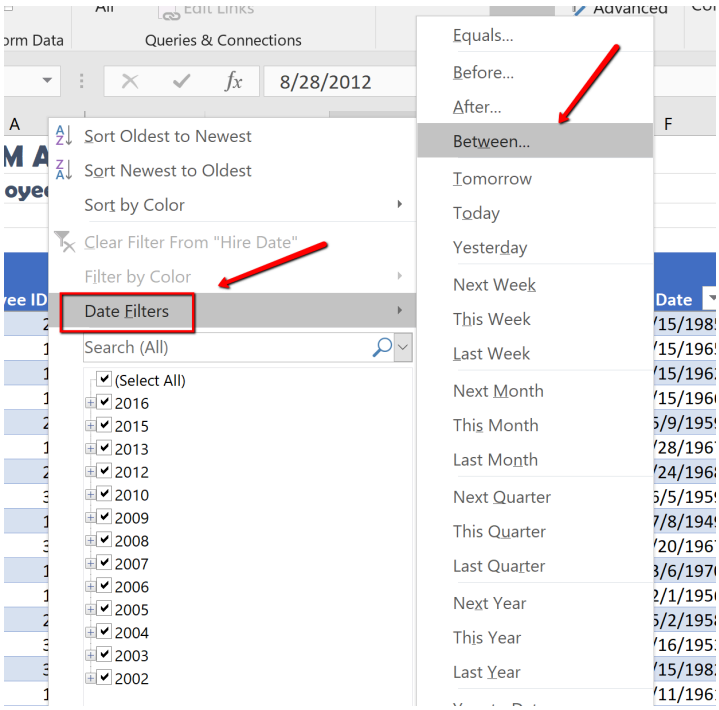


Figure 5.37 Date Filter Menu

3. Search for employees with a hire date between 2013, and 2016. In the "**is after or equal to"** section type **1/01/2013**, and typing in the "**is before or equal to"** section type **12/31/2016**. Then click **OK**.

Mac Users: Excel for Mac sections simply say "**After"** and **"Before"**

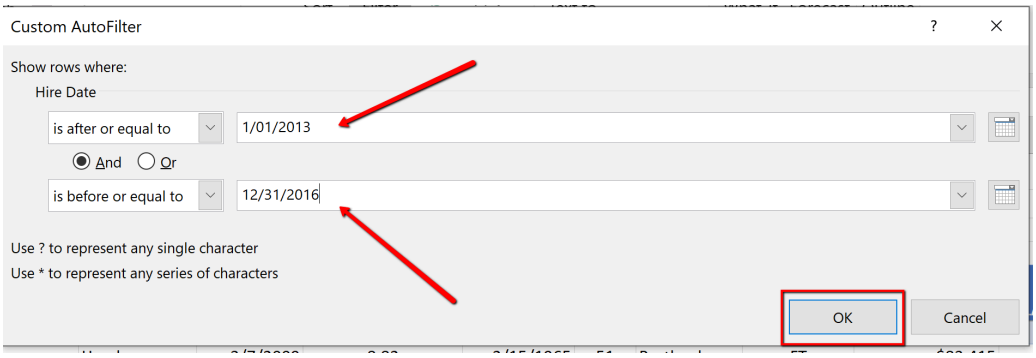


Figure 5.38 Date Filter Between Dialogue Box

4. Sort the filtered table from **Oldest to Newest** by Date Hired.

5. In the total row section, count the last name names of the employees by applying the count function in cell B108.

6. In the total row, select cell **I108**, and choose **None** to turn off the count function in the Job Status Column.

Notice the table total row show 47 employees hired between the specified dates. These employees will be evaluated for a COLA adjustment.

Notice the filter button displays a filter symbol and an up arrow indicating the column is filtered and sorted in ascending order.

WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increas
2070	James	Pearce	12/4/2015	2.08	5/9/1959	57	Portland	FT	$96,282	2.0%	$1,925.64
2030	Elizabeth	Miller	12/8/2015	2.07	12/4/1961	55	Seattle	FT	$38,420	3.5%	$1,344.70
2046	Michael	Morgan	12/18/2015	2.04	1/6/1968	48	San Francisco	FT	$71,020	3.0%	$2,130.60
1186	Michael	Davis	1/1/2016	2.00	6/10/1966	50	Seattle	FT	$96,960	3.5%	$3,393.60
1134	James	Bennett	1/20/2016	1.95	3/21/1957	59	Seattle	FT	$94,502	3.5%	$3,307.57
1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,244	3.5%	$1,828.54
1362	John	Jenkins	1/22/2016	1.94	4/2/1991	25	San Francisco	FT	$54,945	3.0%	$1,648.35
3206	Larry	Roeder	1/29/2016	1.92	11/1/1982	34	Seattle	FT	$54,368	3.5%	$1,902.88
1354	Edwin	Jackson	3/12/2016	1.81	3/20/1979	37	San Diego	FT	$53,826	2.5%	$1,345.65
2094	Robert	Ramos	4/19/2016	1.70	4/11/1962	54	Seattle	FT	$76,677	3.5%	$2,683.70
Total			**47**						**$3,569,059**	**3.0%**	**$106,540.55**

Figure 5.39 Date Filter and Sort

SLICERS

Another way to filter an Excel table is with slicers. Slicers, generally speaking, are visual filter buttons you can click to filter the table data. Slicers show the current filtered category, which makes it easy to understand what exactly is displayed. For example, a slicer for the Store field would have buttons for the Seattle, San Diego, Portland, and San Francisco locations.

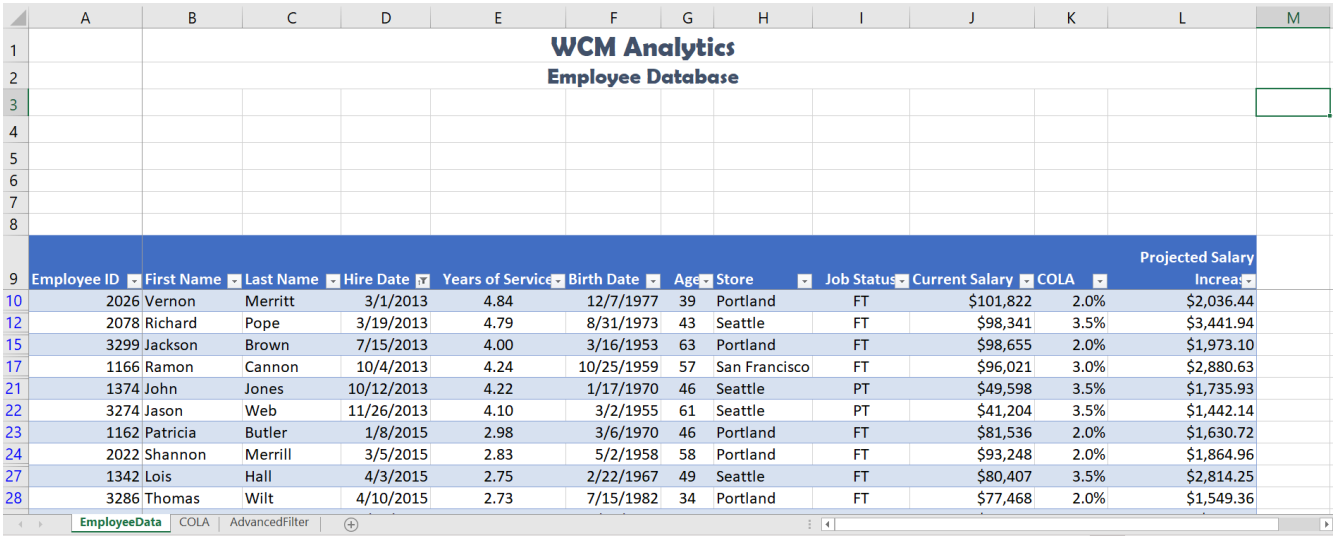
When slicer buttons are selected, the data is filtered to show only those records that match the criteria. Multiple buttons can be selected at the same time, and a table can have multiple slicers, each linked to a different field. When multiple slicers are used, Excel uses the AND logical operator so filtered records must meet all of the criteria indicated in the slicer. When selecting multiple buttons in a Slicer, use the shift key to select adjacent field names. If the field names are not adjacent, use the non-adjacent selection method, pressing the CTL button, and selecting the field names needed.

Follow the below steps to filter the table using visual Slicer buttons.

1. Click in the table area. From the Data tab, choose **Clear** to remove the current sort and filter applied to the data.

2. To make room for the **Slicer** buttons at the top of the table, we will add 4 rows between the title and the table area. Right-click cell A3. Choose Insert. Select **Entire Row**. Repeat these steps until the table heading starts in row **A9**.

Mac users should hold down **CTRL key** and click cell A3. Then repeat until the table heading starts in row **A9.**



WCM Analytics
Employee Database

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increa
2026	Vernon	Merritt	3/1/2013	4.84	12/7/1977	39	Portland	FT	$101,822	2.0%	$2,036.44
2078	Richard	Pope	3/19/2013	4.79	8/31/1973	43	Seattle	FT	$98,341	3.5%	$3,441.94
3299	Jackson	Brown	7/15/2013	4.00	3/16/1953	63	Portland	FT	$98,655	2.0%	$1,973.10
1166	Ramon	Cannon	10/4/2013	4.24	10/25/1959	57	San Francisco	FT	$96,021	3.0%	$2,880.63
1374	John	Jones	10/12/2013	4.22	1/17/1970	46	Seattle	PT	$49,598	3.5%	$1,735.93
3274	Jason	Web	11/26/2013	4.10	3/2/1955	61	Seattle	PT	$41,204	3.5%	$1,442.14
1162	Patricia	Butler	1/8/2015	2.98	3/6/1970	46	Portland	FT	$81,536	2.0%	$1,630.72
2022	Shannon	Merrill	3/5/2015	2.83	5/2/1958	58	Portland	FT	$93,248	2.0%	$1,864.96
1342	Lois	Hall	4/3/2015	2.75	2/22/1967	49	Seattle	FT	$80,407	3.5%	$2,814.25
3286	Thomas	Wilt	4/10/2015	2.73	7/15/1982	34	Portland	FT	$77,468	2.0%	$1,549.36

EmployeeData | COLA | AdvancedFilter

Figure 5.40 Added Rows

3. Click back into the table area. Choose the **Insert** tab. Click **Slicer**. When the Insert Slicers dialogue box opens, click the **Store** and **Job Status** field names to display as slicers. Click **OK**.

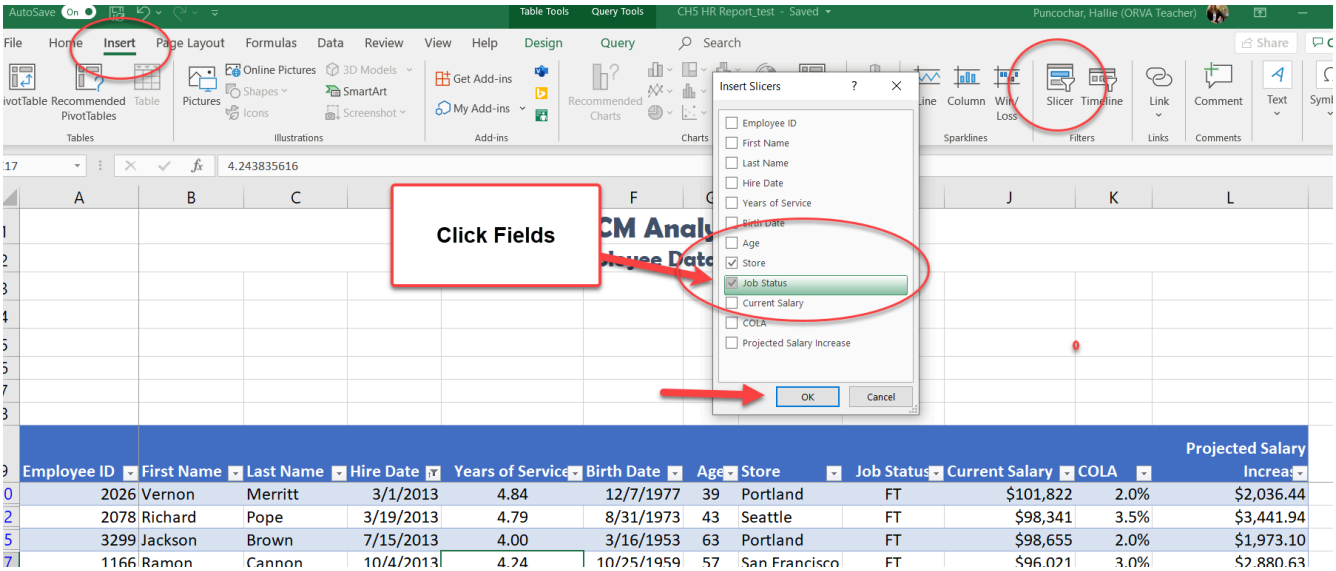
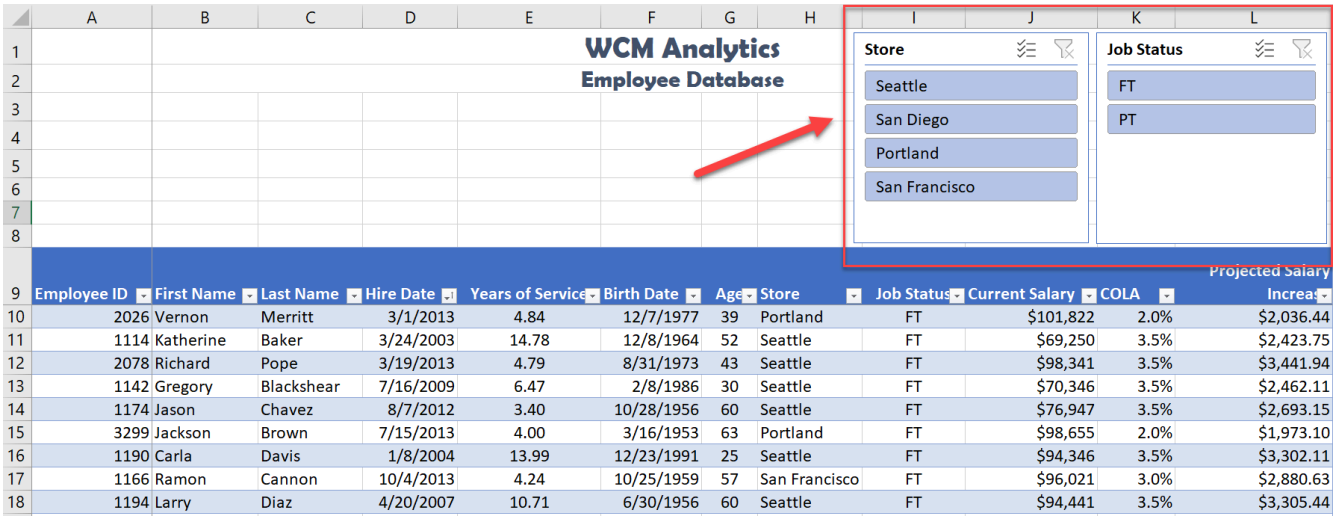


Figure 5.41 Slicer Dialogue Box

4. Move, and re-size the Slicer boxes to fit in the **approximate** area of **I1:J8** and **K1:L8**. Make sure the buttons remain visible. Below is a visual example.



WCM Analytics
Employee Database

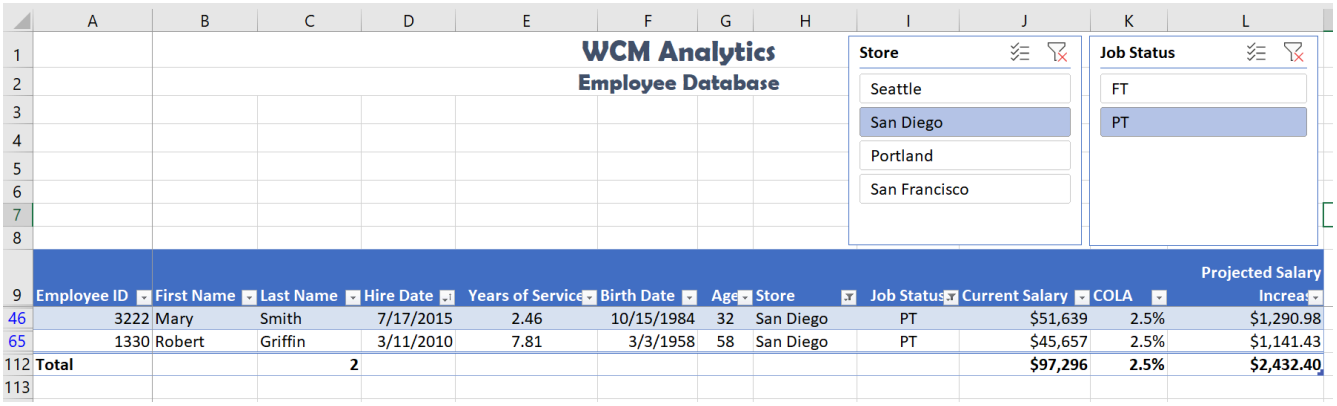
Store: Seattle, San Diego, Portland, San Francisco
Job Status: FT, PT

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increas
2026	Vernon	Merritt	3/1/2013	4.84	12/7/1977	39	Portland	FT	$101,822	2.0%	$2,036.44
1114	Katherine	Baker	3/24/2003	14.78	12/8/1964	52	Seattle	FT	$69,250	3.5%	$2,423.75
2078	Richard	Pope	3/19/2013	4.79	8/31/1973	43	Seattle	FT	$98,341	3.5%	$3,441.94
1142	Gregory	Blackshear	7/16/2009	6.47	2/8/1986	30	Seattle	FT	$70,346	3.5%	$2,462.11
1174	Jason	Chavez	8/7/2012	3.40	10/28/1956	60	Seattle	FT	$76,947	3.5%	$2,693.15
3299	Jackson	Brown	7/15/2013	4.00	3/16/1953	63	Portland	FT	$98,655	2.0%	$1,973.10
1190	Carla	Davis	1/8/2004	13.99	12/23/1991	25	Seattle	FT	$94,346	3.5%	$3,302.11
1166	Ramon	Cannon	10/4/2013	4.24	10/25/1959	57	San Francisco	FT	$96,021	3.0%	$2,880.63
1194	Larry	Diaz	4/20/2007	10.71	6/30/1956	60	Seattle	FT	$94,441	3.5%	$3,305.44

Figure 5.42 Slicer Layout Example

5. From the **Store** slicer, click the **San Diego** button. Notice the data filters to only show the data for San Diego.

6. From the **Job Status** slicer click **PT**. Notice the data filters to only show the data for PT employees in San Diego.



WCM Analytics
Employee Database

Store: Seattle, San Diego, Portland, San Francisco
Job Status: FT, PT

Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increas
3222	Mary	Smith	7/17/2015	2.46	10/15/1984	32	San Diego	PT	$51,639	2.5%	$1,290.98
1330	Robert	Griffin	3/11/2010	7.81	3/3/1958	58	San Diego	PT	$45,657	2.5%	$1,141.43
Total			2						$97,296	2.5%	$2,432.40

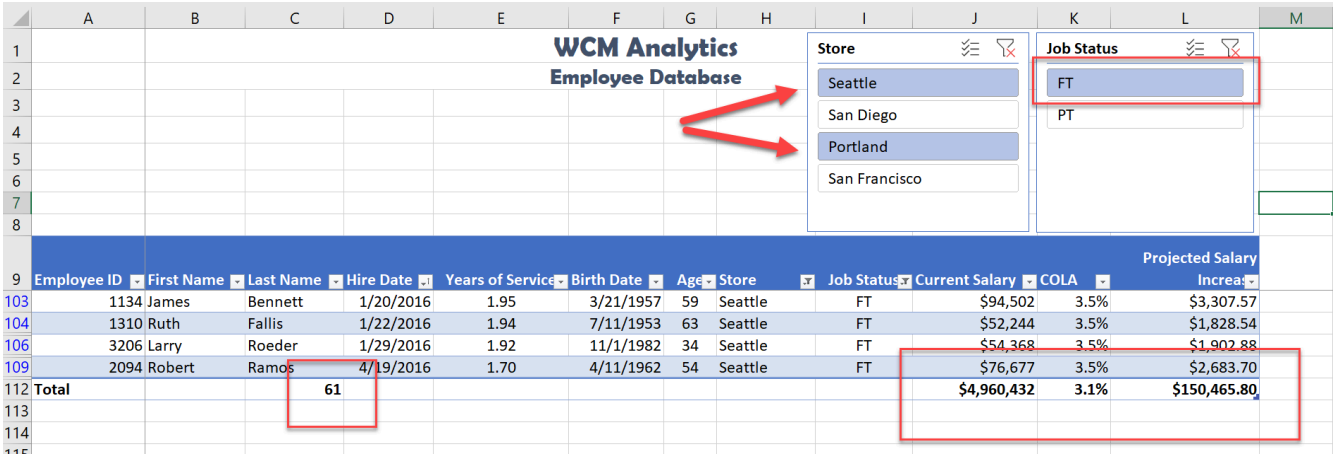
Figure 5.43 Slicer Solution

7. Return to the Store slicer and choose **Seattle** and **Portland**. Note the non-adjacent selection method is needed. Select Seattle first, then press and hold the Ctrl button on the keyboard, and then select **Portland**.

Mac Users: hold down the Command key not the Ctrl key before you click on Portland.

8. Change the Job Status slicer selection to **FT**.

The table results show there are **61** FT employees in Seattle and Portland. The Projected Salary Increase after the COLA adjustment for the Northwest region is $150,465.80.



Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increas
1134	James	Bennett	1/20/2016	1.95	3/21/1957	59	Seattle	FT	$94,502	3.5%	$3,307.57
1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,244	3.5%	$1,828.54
3206	Larry	Roeder	1/29/2016	1.92	11/1/1982	34	Seattle	FT	$54,368	3.5%	$1,902.88
2094	Robert	Ramos	4/19/2016	1.70	4/11/1962	54	Seattle	FT	$76,677	3.5%	$2,683.70
Total			**61**						**$4,960,432**	**3.1%**	**$150,465.80**

Figure 5.44 Non-Adjacent Slicer Solution

ADVANCED FILTERS

Filter buttons are limited to combining fields using advanced logic or complex criteria. If the data you want to filter requires complex criteria, you can use the **Advanced Filter** dialog box. The Advanced Filter works differently from the **Filter** command in several important ways:

- It displays the **Advanced Filter** dialog box instead of the AutoFilter menu.
- You type the advanced criteria in a separate criteria range in a worksheet and above the range of cells or table that you want to filter. Excel uses the separate criteria range in the **Advanced Filter** dialog box as the source for the advanced criteria.

For example, you searched records for employees in the Seattle and San Diego offices AND for employees working at full-time bases, AND have a base salary between the below Salary Ranges:

Store	Job Status	Current Salary	Current Salary
• Seattle • San Diego	• Full Time • Full Time	• >=$50,000 • >=$70,000	• <=$60,000 • <=$80,000

Figure 5.45 Advanced Filter Criteria

To run the above complex criteria mentioned above follow the below steps:

1. From the **EmployeeData** sheet, click in the table, then select the Data tab and clear the current filters by selecting the Clear button.
2. Select the Table Tools Design tab and turn off the Total Row.
   Mac Users: just click the Table tab and turn off the Total Row
3. Select the **Advanced Filter** sheet. Click cell A10. The criteria mentioned in the above example has already been entered for this advanced filter exercise. Next, you will use an advanced filter to copy the records that match these criteria.
4. From the **Data** tab, click the **Advanced** button. The Advanced Filter dialog box opens.
5. Click the **Copy to another location** option button to copy matching records from the data range.
6. Click in the List range box to make it active, and then navigate to the EmployeesData sheet, click **cell A9**, and then press and hold the **CTRL** and **SHIFT** and **SPACEBAR** to select the entire table. In the List range box, you will see **Employee_DB[#All]** in the list range box.
   Mac Users: The keyboard shortcut of "CTRL, SHIFT, SPACEBAR" **does not work** in Exel for Mac. You should click in **Cell A9**, scroll down to the end of the data, hold down the **Shift key** and click in C**ell L112** to select the entire table
7. Click, or press the tab key, to move to the Criteria Range box.
8. From the Advanced Filter sheet, select A6:D8. You will see **'Advanced Filter'!Criteria** populate in the criteria range box.
9. Click, or press the tab key, to move to the Copy to box, and then click cell A10 to specify the location for inserting the copied records. You will see **'Advanced Filter'!$A$10** in the Copy to criteria range box.

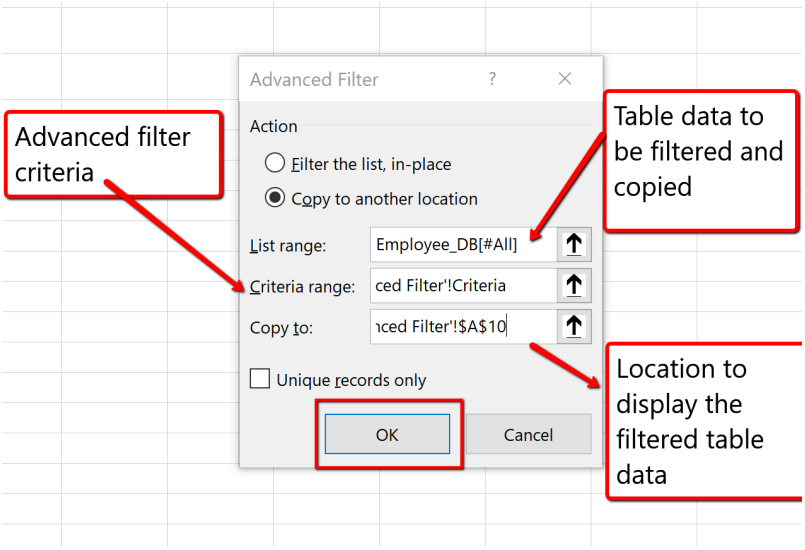


Figure 5.46 Advanced Filter Dialogue Box

9. Click **OK** to copy the records that match the advanced filter criteria. Save your work.

The advanced search results list 7 employees that meet the criteria. Of these 7 employees, only 1 full-time employee in San Diego has a current salary between $70,000 and $80,000 dollars, and 6 full-time Seattle employees have a current salary between $50,000 and $60,000 dollars.

WCM Analytics
Advanced Filter Criteria
Seattle & San Diego Current Salaries

Store	Job Status	Current Salary	Current Salary
Seattle	FT	>=50000	<=60000
San Diego	FT	>=70000	<=80000

Employee	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increase
1394	Shanika	Lloyd	8/24/2004	13.36	8/11/1966	50	Seattle	FT	$53,186	3.5%	$1,861.51
3242	Charles	Taylor	2/5/2012	3.90	1/18/1947	69	Seattle	FT	$58,291	3.5%	$2,040.19
3258	Johnny	Vazquez	9/18/2006	11.29	6/16/1953	63	Seattle	FT	$52,125	3.5%	$1,824.38
3214	Robert	Ross	8/28/2015	2.35	9/24/1974	42	Seattle	FT	$58,309	3.5%	$2,040.82
1350	Patrice	Hutton	12/29/2009	6.01	4/4/1953	63	San Diego	FT	$75,037	2.5%	$1,875.93
1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,244	3.5%	$1,828.54
3206	Larry	Roeder	1/29/2016	1.92	11/1/1982	34	Seattle	FT	$54,368	3.5%	$1,902.88

Figure 5.47 Advanced Filter Results

INSERT TABLE

Let's review another away to turn a range of data into a table.

1. Select the **Advanced Filter** sheet, and click cell A10.
2. From the Insert tab, choose **Table**.
3. The Create Table dialogue box will appear.
4. Make sure “My table has headers” is selected so Excel recognizes the column headings.
5. Click **OK**. Excel turns our advance search data into a table.
6. Sort the table in ascending order (A-Z), by Store, and Employee ID, then Last Name. **Hint: Click the Data tab, Click the Sort button, add levels for the three fields.**
7. Autofit the column widths and row height to make sure the heading row is visible.
8. Save your work.

Excel turns the information into a table and sorts accordingly:

WCM Analytics
Advanced Filter Criteria
Seattle & San Diego Current Salaries

Store	Job Status	Current Salary	Current Salary
Seattle	FT	>=50000	<=60000
San Diego	FT	>=70000	<=80000

Employee ID	First Name	Last Name	Hire Date	Years of Servic	Birth Date	Age	Store	Job Statu	Current Salary	COLA	Projected Salary Increa
1350	Patrice	Hutton	12/29/2009	6.01	4/4/1953	63	San Diego	FT	$75,037	2.5%	$1,875.93
1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,244	3.5%	$1,828.54
1394	Shanika	Lloyd	8/24/2004	13.36	8/11/1966	50	Seattle	FT	$53,186	3.5%	$1,861.51
3206	Larry	Roeder	1/29/2016	1.92	11/1/1982	34	Seattle	FT	$54,368	3.5%	$1,902.88
3214	Robert	Ross	8/28/2015	2.35	9/24/1974	42	Seattle	FT	$58,309	3.5%	$2,040.82
3242	Charles	Taylor	2/5/2012	3.90	1/18/1947	69	Seattle	FT	$58,291	3.5%	$2,040.19
3258	Johnny	Vazquez	9/18/2006	11.29	6/16/1953	63	Seattle	FT	$52,125	3.5%	$1,824.38

Figure 5.48 Advanced Filter Table

ANALYZING WORKSHEET DATA

INTRODUCTION TO PIVOT TABLES

Another way to analyze table information is with PivotTables. A PivotTable is a powerful tool that calculates, summarizes, and analyzes table data to compare, patterns, and trends. PivotTables are inserted directly from a table, linking the table data. Generally speaking, when you pivot on the table data you are reorganizing the table information to reveal different levels of detail that allow

you to analyze specific subgroups of information and summarize data quickly and easily without having to change the structure or layout of the original table area.

When you pull table data into a PivotTable there are four main area fields: Rows, Columns, Values, and Filters. The Rows and Columns fields can interchange quickly to summarize the data in different ways or to run new reports based on the question or criteria being asked. The Value field is data from the table that can be calculated, or that contain values that the PivotTable will summarize. The Values field has multiple settings to choose how you want to calculate the data; SUM, COUNT, AVERAGE, MIN, MAX, and can even show the displayed values as a percentage of the total, column total, grand total, and so on. Lastly, is the Filters area, which restricts the PivotTable to only show the values matching specified criteria.

Four Primary PivotTable Areas:

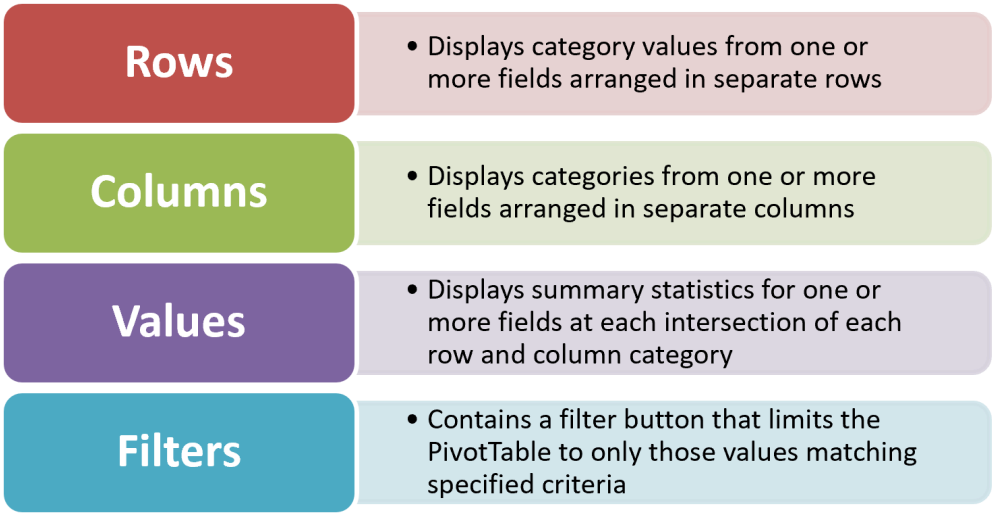


Figure 5.49 Four Primary PivotTable Areas

In our situation, shown below, we will create a PivotTable to summarize employee data to show Projected Salary Increases, for both Part-Time (PT) and Full -Time (FT) employees for all store locations.

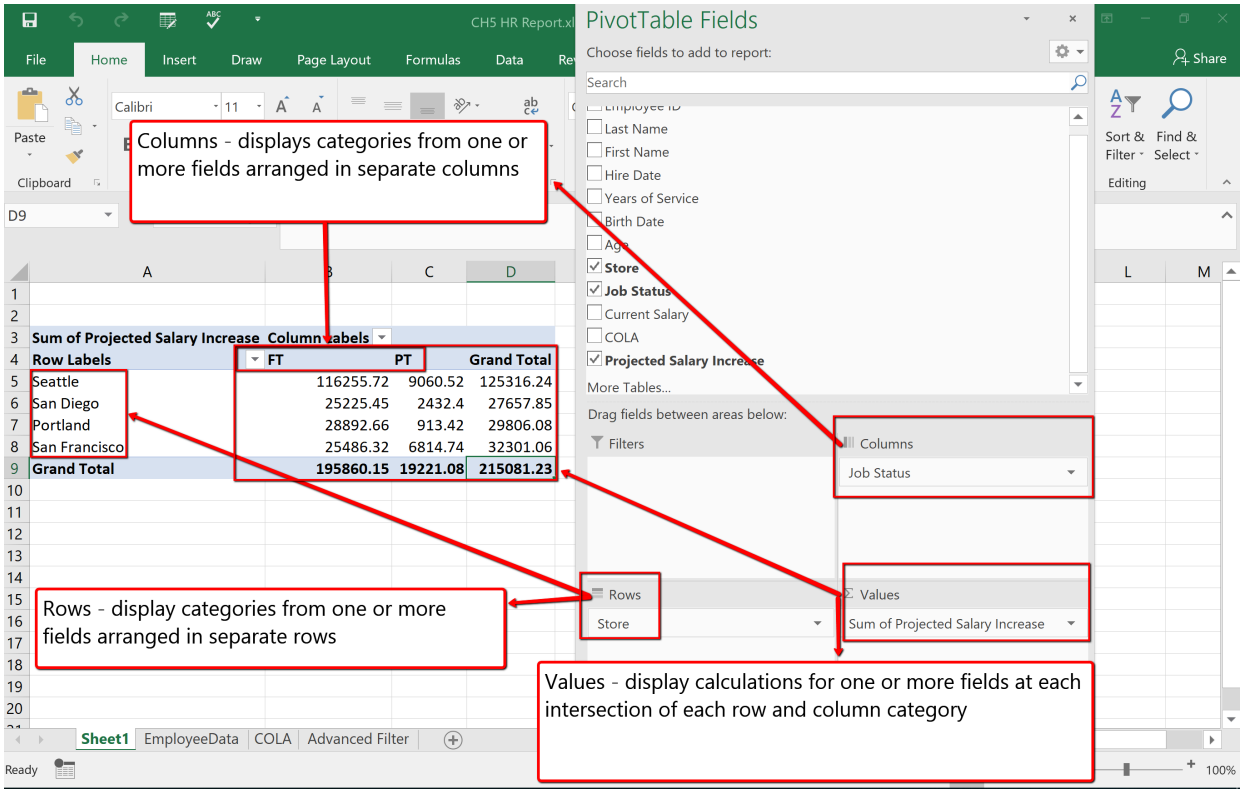


Figure 5.50 Parts Of A PivotTable

Follow the below steps to explore and build a PivotTable report.

1. Click the **EmployeeData** sheet. Click anywhere in the table area.
2. From the **Insert** tab, choose **PivotTable**.

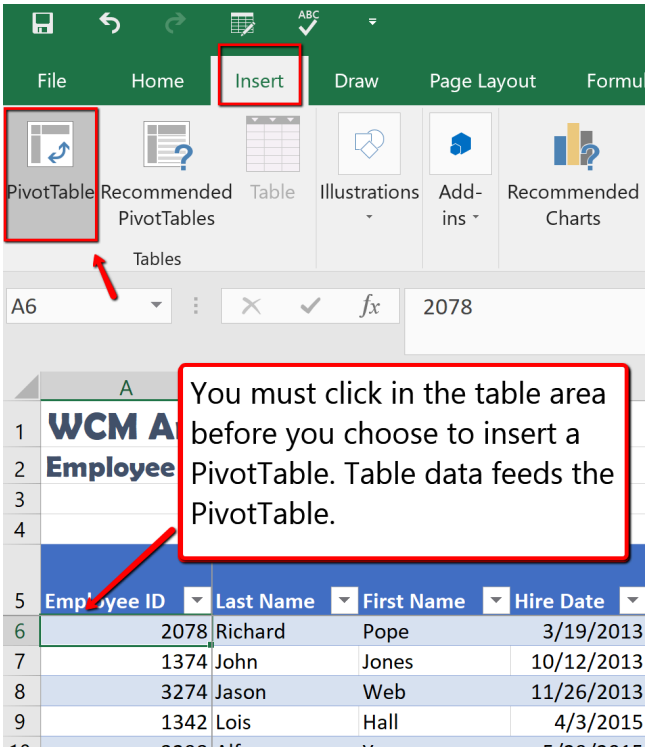


Figure 5.51 Insert PivotTable

3. From the Create PivotTable dialogue box, make sure the PivotTable report will be placed in a **New Worksheet**, and click **OK**.

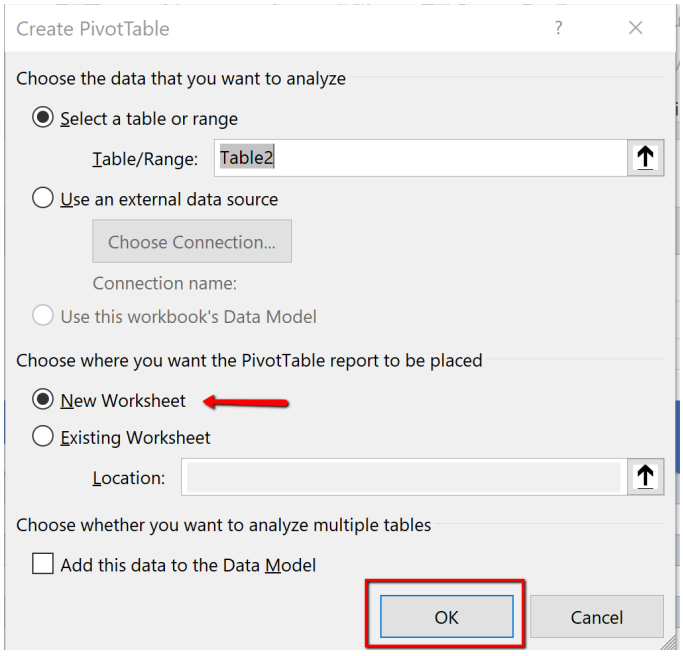


Figure 5.52 Create PivotTable Dialogue Box

4. Notice a new sheet (Sheet1) is inserted, at the bottom of the workbook, that contains the PivotTable1 area and fields dialogue box. Rename the default name (Sheet 1) to **StorePT**.

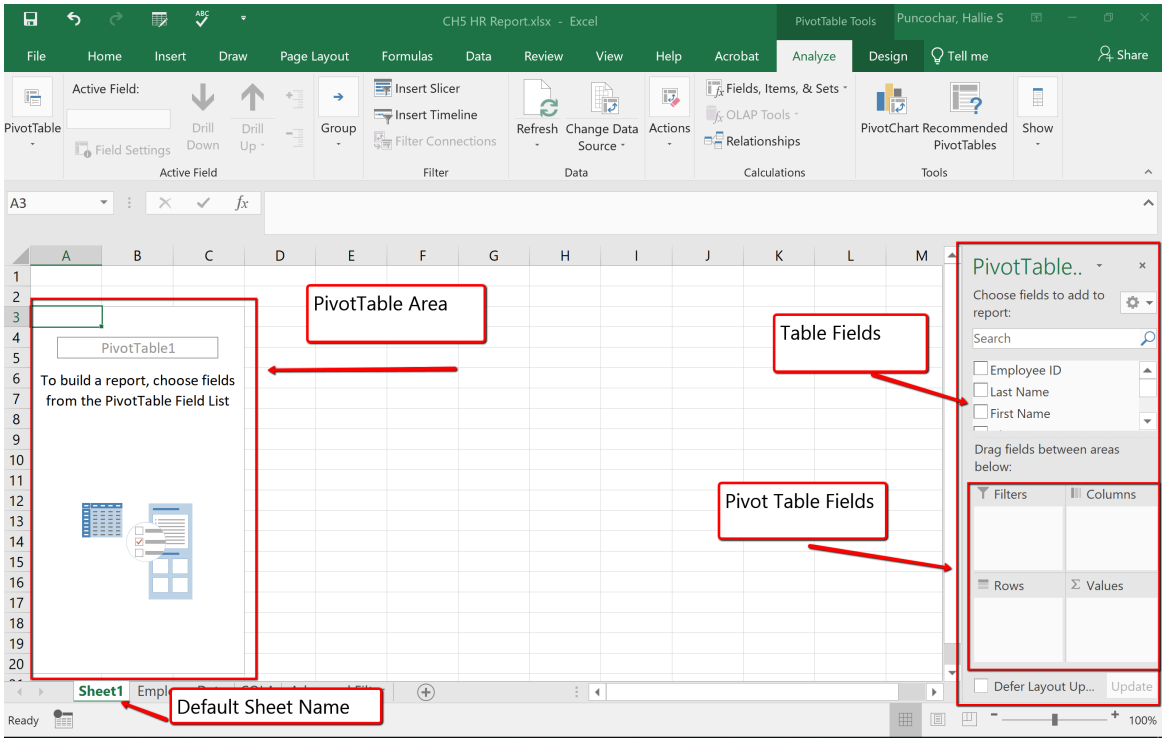


Figure 5.53 PivotTable Window

5. From the PivotTable pane, drag and drop the **Store** heading to the **Rows** section of Pivot-Table field area.

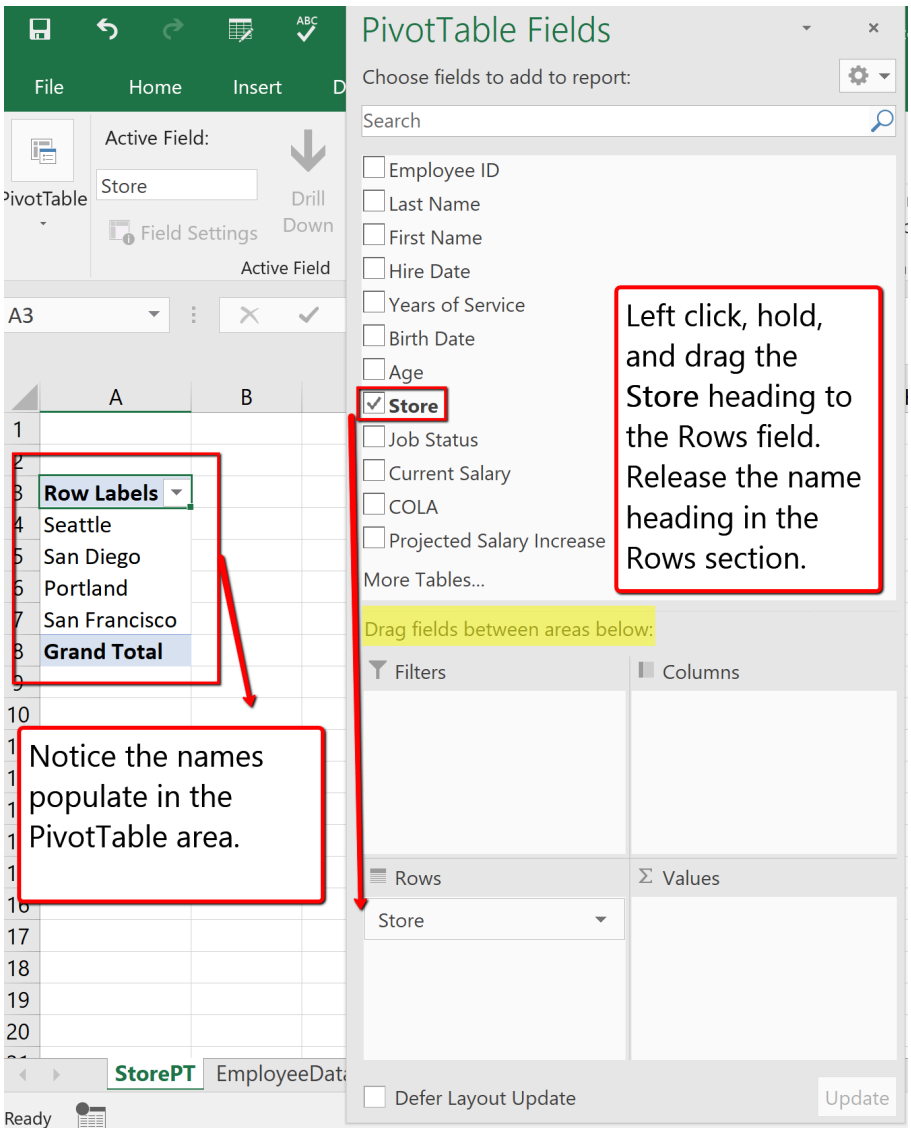


Figure 5.54 PivotTable Row Selection

6. From the PivotTable fields list drag and drop the **Projected Salary Increase** heading to the **Values** section.

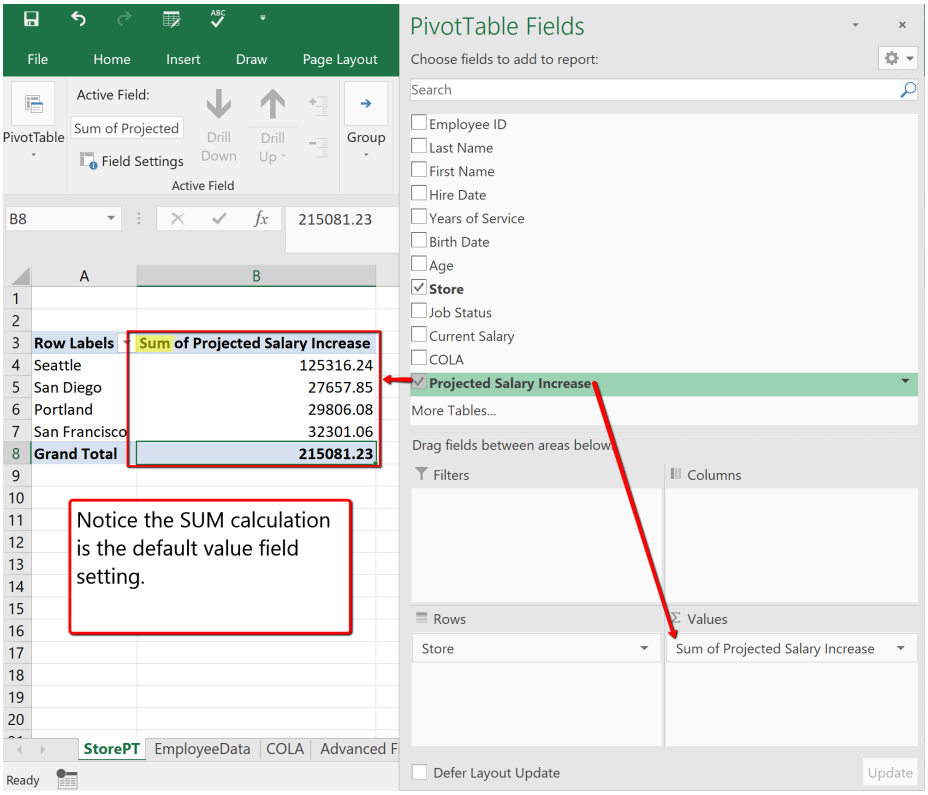


Figure 5.55 PivotTable Value Selection

7. Drag and Drop the **Job Status** heading to the **Columns** field section. Notice the Job Status categories display. In this case, displaying Full-Time (FT) and Part-Time (PT) employees.

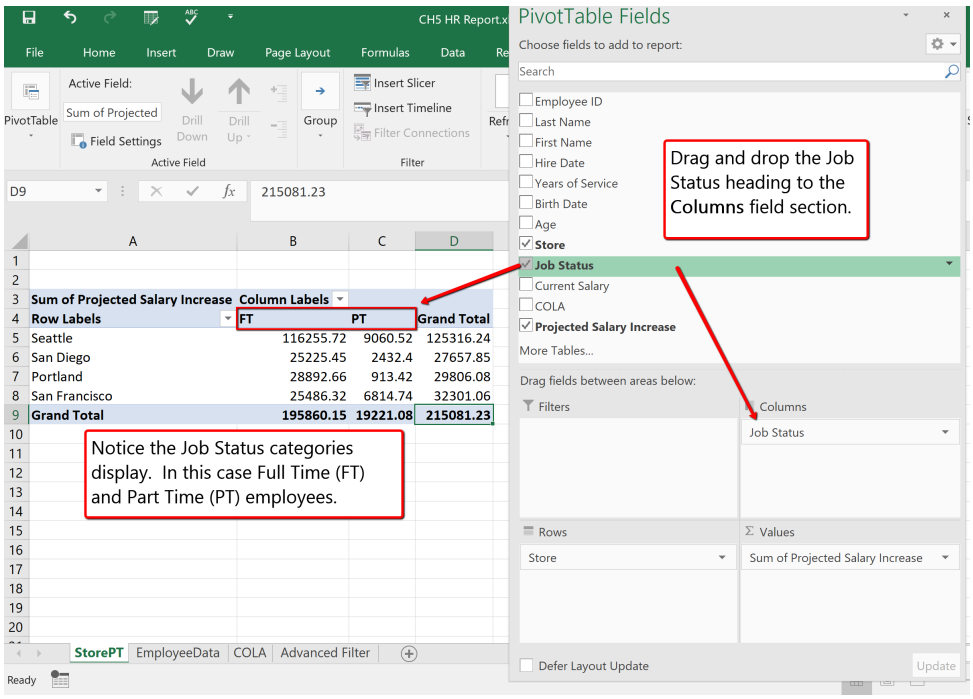


Figure 5.56 PivotTable Columns Selection

FORMATTING PIVOT TABLES

After creating a PivotTable and adding the fields that you want to analyze, you may want to enhance the report to include slicers, or graphs and or format the data to make it easier to read and scan for details. When clicked in the PivotTable area you will see a contextual tab appear on the ribbon, containing PivotTable Tools and two specific tabs; Analyze and Design. **Mac Users: there is not a "PivotTable Tools" tab but you will see two tabs named: PivotTable Analyze and Design. They are only visible when you have clicked inside the PivotTable area.**

The Analyze tab contains tools specifically for examining data, for example, the ability to insert Slicers, or PivotCharts. The Design tab contains tools that specifically tie to how the table and data visibly display. For example, when you have a lot of data in your PivotTable, it may help to show banded rows or columns for easy scanning or to highlight important data to make it stand out.

Follow the below steps to add format the PivotTable, and add a PivotChart.

1. Click in the PivotTable. From the PivotTable Tools choose the Design tab.
2. In the PivotTable Styles gallery select the Light Blue, Pivot Style Medium Style 2 format.

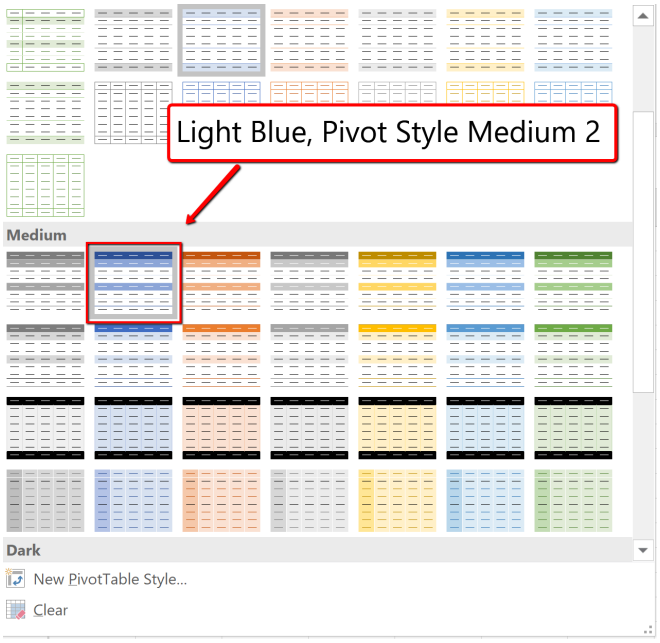


Figure 5.57 Light_Blue Medium Style Pivot 2

3. To format the PivotTable numbers, select B5: D9. Click the Home tab. Apply the Currency number format and decrease the decimal place to zero decimals.

(The alternative method to number formatting in a PivotTable is to expand the menu on value field; Sum of Projected Salary Increase. Click the Value Field Settings. Choose Number Format and apply the desired number format option. Mac Users should click the small circle with an "i" next to "Sum Projected Salary Increase" in the Values section then click the Number button to change the Number Format. 

)

NOW LET'S CREATE A PIVOTCHART!

4. Click in the PivotTable. Click the Analyze tab. Choose the PivotChart button on the Ribbon.

5. From the listed chart types, choose Column. And select the 3D Clustered Column option. Click OK.

Mac Users: Only a basic, 2D column chart is available when clicking the **Pivot Chart** button. In order to select a different chart type, such as the 3D clustered column option, you must do the following:

- Click on the 2D chart that was just inserted
- Click the **Design tab** on the Ribbon
- Click the **Change Chart Type** button

- Select the 3D Clustered Column option

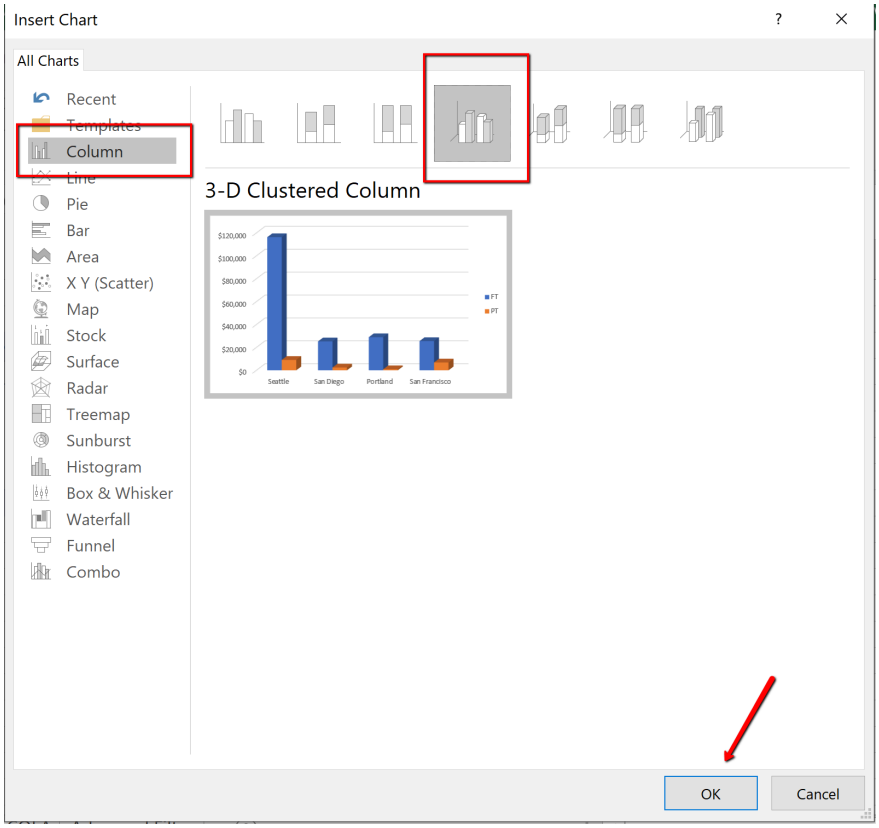


Figure 5.58 3D Clustered_Column Chart

6. Move the PivotChart under the PivotTable area. Resize accordingly. Save your work.

Note the formatting changes in the new chart below. The "Job Status" and "Store" buttons are column and row "filters" for the Pivot Chart.

Mac Users: Excel for Mac does not insert these formatting changes within a Pivot Chart. You can add a chart title by clicking the "Add Chart Element" button from the Design tab. It is **not possible** to add the "chart filter" buttons as shown in Figure 5.59. The filters on the pivot table can be used to also filter the columns and rows in the Pivot Chart.

Sum of Projected Salary Increase	Column Labels		
Row Labels	FT	PT	Grand Total
Seattle	$119,600	$9,061	$128,661
San Diego	$25,225	$2,432	$27,658
Portland	$30,866	$913	$31,779
San Francisco	$25,486	$6,815	$32,301
Grand Total	**$201,178**	**$19,221**	**$220,399**

Figure 5.59 PivotTable Solution

SUBTOTALS

Another way to summarize data is by using subtotals. Analyzing a large data range usually includes making calculations on the data. You can summarize the data by applying summary functions such as COUNT, SUM, and AVERAGE to the entire organized range of information. Subtotals, in general, are summary functions applied to parts of an organized data range.

For example, you can SUM Current Salaries for employees from each Store location. To subtotal the information the data must first be sorted by the Store field. For subtotals, the field that you sort is referred to as the control field. For example, if you choose the Store location as your control field, all of the Seattle, San Diego, Portland, and San Francisco entries will be grouped together within the data range. The SUM function then can be applied to SUM the Current Salary fields for each Store location. Excel calculates and displays the subtotal each time the Store location changes.

A new row containing a subtotal of that particular location will be inserted, and wherever the field changes a value will display; a subtotal group of records. Excel updates the subtotal automatically when the control field is changed. In theory, when subtotaling, you are adding a calculation row to the set of data. Adding rows that total information in the middle of a table would compromise

the integrity of data in the table. The table tools would look at the total as a record, not a calculation. Therefore the Subtotal feature cannot be used in tabling, and can only be applied to a normal range of data. You must convert all tables to a range prior to subtotaling.

Multiple functions can be applied within the same Subtotal. For example, we will explore how you can SUM Current Salary's and also provide the AVERAGE Current Salary for each Store location within the same Subtotal. Note Subtotal data can also be filtered.

The best practice when subtotaling is to follow four rules:

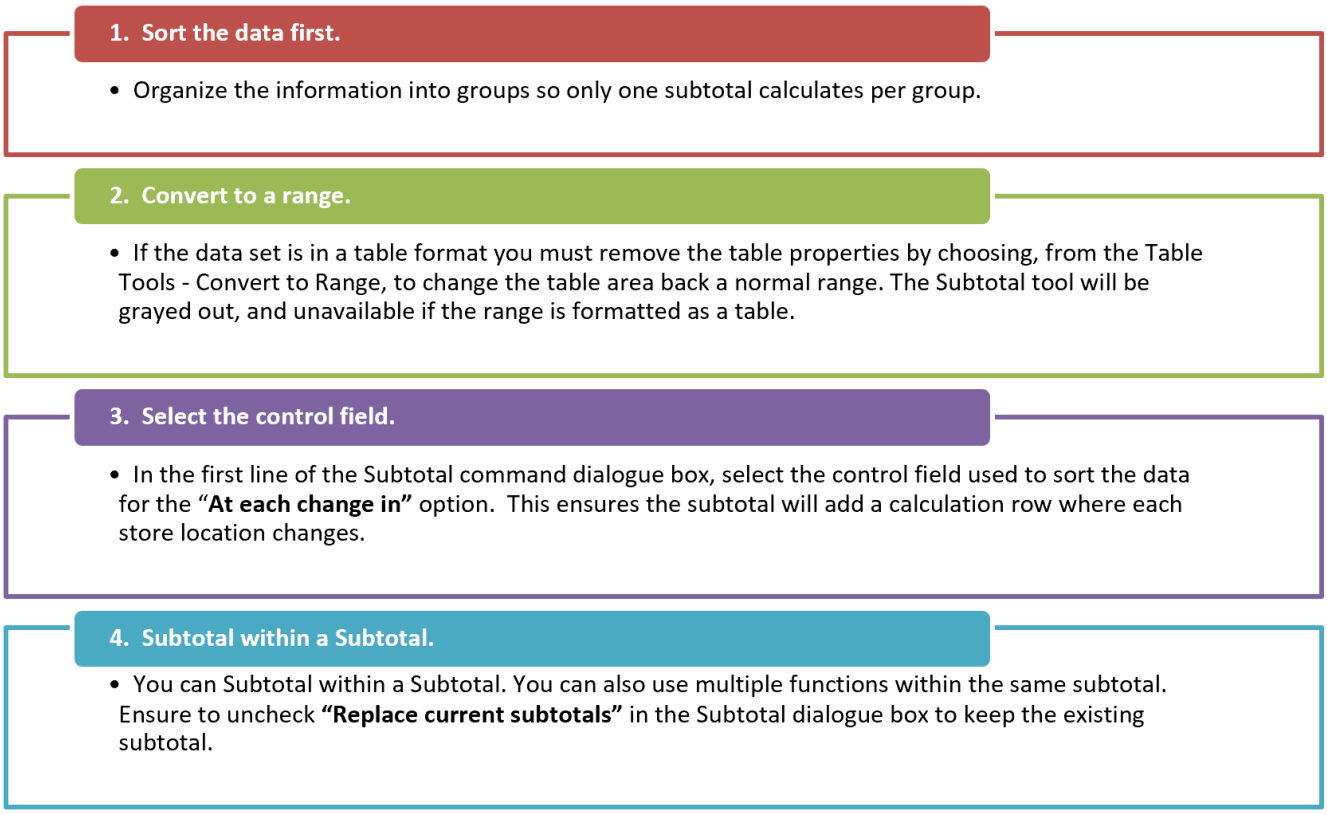


Figure 5.60 Subtotal Rules

Follow the below steps to Subtotal the Employee Data and provide a total Current Salary per Store.

1. Select the **Employee Data** sheet. If necessary clear any filters applied to the data by clicking the Data tab and choosing the Clear filter option.
2. From the Data tab, choose Sort button. Sort the Store Location, using the preferred Custom List order of Seattle, San Diego, Portland, and San Francisco. If the list we set up previously is not available type the entries in the List entries area. Choose Add, and then OK.

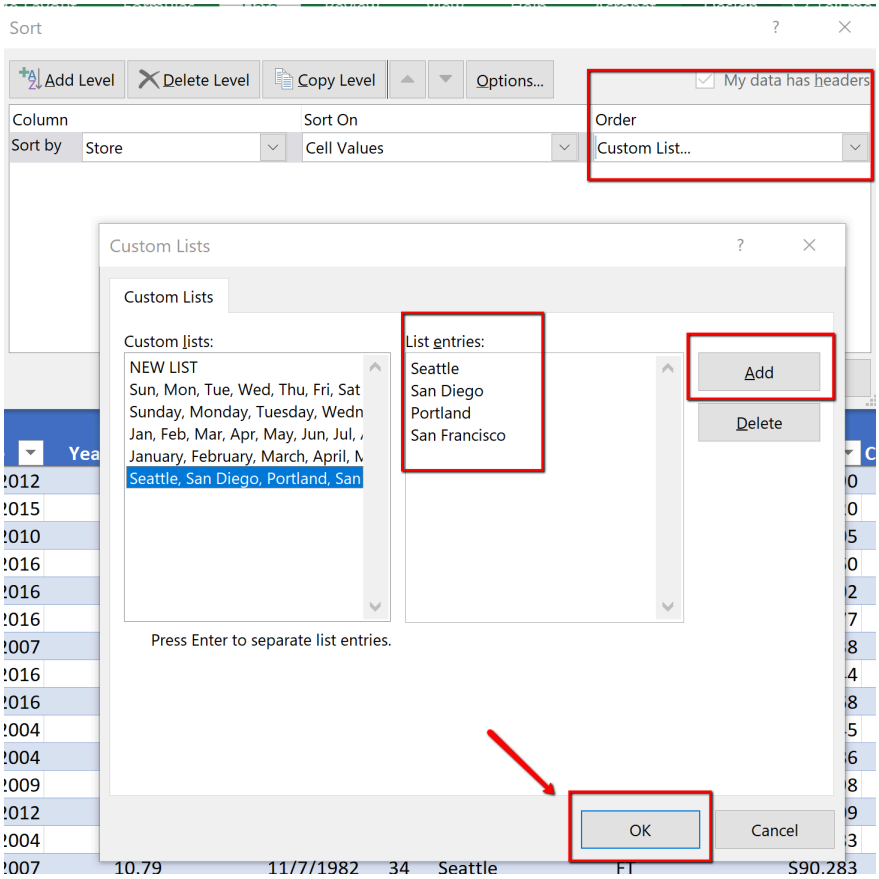


Figure 5.61 Custom Sort, Custom List Dialogue Box.

3. Choose the Table Tools Design tab. **Mac Users:** just click the **"Table" tab.**

   Select "**Convert to Range.**" Excel will display a message asking if you really want to convert the table back to a normal range. Choose **Yes.**

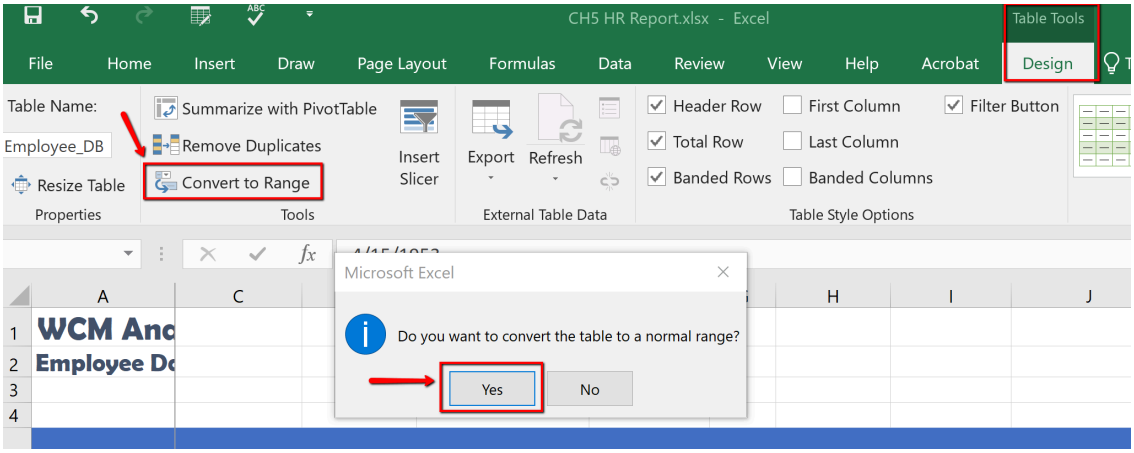


Figure 5.62 Convert To A Range

4. Click the Data tab, in the Outline group find and select the Subtotal Command. (Notice the heading row no longer has filters buttons. The data looks like a table but is not a table. The table tools are not active, and the information is a normal range.)

5. In the Subtotal dialogue box, choose the Store field in the "**At each change in**." For the "**Use Function**," choose **Sum**, and only check **Current Salary**. Click **OK.**

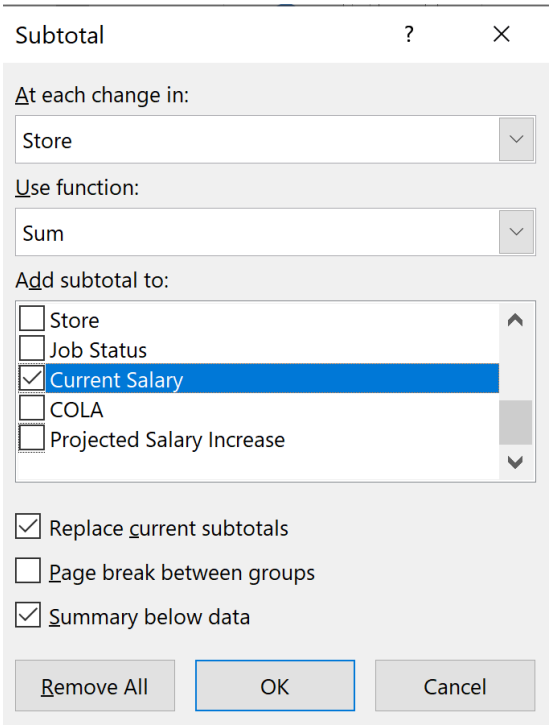
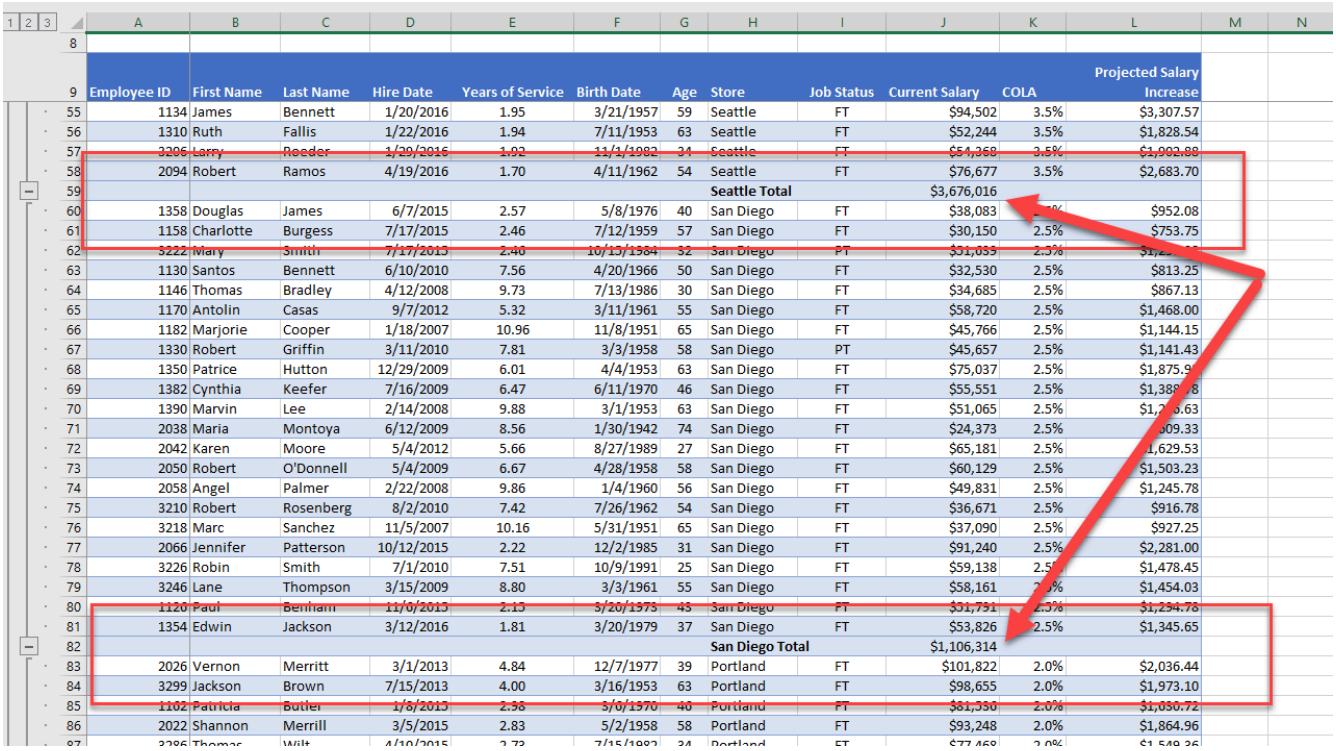


Figure 5.64 Subtotal Dialogue Box

6. Notice the Current Salary column is totaled, per location. Save your work.



Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increase
1134	James	Bennett	1/20/2016	1.95	3/21/1957	59	Seattle	FT	$94,502	3.5%	$3,307.57
1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,244	3.5%	$1,828.54
3206	Larry	Reeder	1/29/2016	1.92	11/3/1982	34	Seattle	FT	$54,368	3.5%	$1,902.88
2094	Robert	Ramos	4/19/2016	1.70	4/11/1962	54	Seattle	FT	$76,677	3.5%	$2,683.70
							Seattle Total		$3,676,016		
1358	Douglas	James	6/7/2015	2.57	5/8/1976	40	San Diego	FT	$38,083	2.5%	$952.08
1158	Charlotte	Burgess	7/17/2015	2.46	7/12/1959	57	San Diego	FT	$30,150	2.5%	$753.75
3222	Mary	Smith	7/17/2015	2.46	10/15/1984	32	San Diego	PT	$51,033	2.5%	$1,2[illegible]
1130	Santos	Bennett	6/10/2010	7.56	4/20/1966	50	San Diego	FT	$32,530	2.5%	$813.25
1146	Thomas	Bradley	4/12/2008	9.73	7/13/1986	30	San Diego	FT	$34,685	2.5%	$867.13
1170	Antolin	Casas	9/7/2012	5.32	3/11/1961	55	San Diego	FT	$58,720	2.5%	$1,468.00
1182	Marjorie	Cooper	1/18/2007	10.96	11/8/1951	65	San Diego	FT	$45,766	2.5%	$1,144.15
1330	Robert	Griffin	3/11/2010	7.81	3/3/1958	58	San Diego	PT	$45,657	2.5%	$1,141.43
1350	Patrice	Hutton	12/29/2009	6.01	4/4/1953	63	San Diego	FT	$75,037	2.5%	$1,875.9[illegible]
1382	Cynthia	Keefer	7/16/2009	6.47	6/11/1970	46	San Diego	FT	$55,551	2.5%	$1,388.[illegible]
1390	Marvin	Lee	2/14/2008	9.88	3/1/1953	63	San Diego	FT	$51,065	2.5%	$1,2[illegible].63
2038	Maria	Montoya	6/12/2009	8.56	1/30/1942	74	San Diego	FT	$24,373	2.5%	[illegible]09.33
2042	Karen	Moore	5/4/2012	5.66	8/27/1989	27	San Diego	FT	$65,181	2.5%	1,629.53
2050	Robert	O'Donnell	5/4/2009	6.67	4/28/1958	58	San Diego	FT	$60,129	2.5%	$1,503.23
2058	Angel	Palmer	2/22/2008	9.86	1/4/1960	56	San Diego	FT	$49,831	2.5%	$1,245.78
3210	Robert	Rosenberg	8/2/2010	7.42	7/26/1962	54	San Diego	FT	$36,671	2.5%	$916.78
3218	Marc	Sanchez	11/5/2007	10.16	5/31/1951	65	San Diego	FT	$37,090	2.5%	$927.25
2066	Jennifer	Patterson	10/12/2015	2.22	12/2/1985	31	San Diego	FT	$91,240	2.5%	$2,281.00
3226	Robin	Smith	7/1/2010	7.51	10/9/1991	25	San Diego	FT	$59,138	2.5%	$1,478.45
3246	Lane	Thompson	3/15/2009	8.80	3/3/1961	55	San Diego	FT	$58,161	2.5%	$1,454.03
1120	Paul	Benham	11/6/2015	2.15	5/20/1973	43	San Diego	FT	$51,751	2.5%	$1,294.78
1354	Edwin	Jackson	3/12/2016	1.81	3/20/1979	37	San Diego	FT	$53,826	2.5%	$1,345.65
							San Diego Total		$1,106,314		
2026	Vernon	Merritt	3/1/2013	4.84	12/7/1977	39	Portland	FT	$101,822	2.0%	$2,036.44
3299	Jackson	Brown	7/15/2013	4.00	3/16/1953	63	Portland	FT	$98,655	2.0%	$1,973.10
1102	Patricia	Butler	1/8/2015	2.58	5/6/1970	46	Portland	FT	$81,550	2.0%	$1,630.72
2022	Shannon	Merrill	3/5/2015	2.83	5/2/1958	58	Portland	FT	$93,248	2.0%	$1,864.96
3286	Thomas	Wilt	4/10/2015	2.73	7/15/1982	34	Portland	FT	$77,468	2.0%	$1,549.36

Figure 5.65 Subtotal Solution

SUBTOTAL OUTLINE VIEW

The Outline views, located on the left side panel, show summary statistics. The Outline tool, with levels, allows you to control the expanse of detail displayed in the worksheet. The EmployeeData worksheet has three levels in the outline of its data range:

- Level 1, displays only the grand totals.
- Level 2, displays the total spent at each Store.
- Level 3, displays the total Salary.

Figure 5.66 above shows the Level 3 Outline, all the employee detail per store location. Clicking the outline buttons located to the left of the row numbers lets you choose how much detail you want to see in the worksheet. (Note that the three level numbers are at the top left side of the worksheet, just below the Name box.)

You will use the outline buttons to expand and collapse different sections of the data range.

1. Click level 1. Notice it displays the Grand Total.
2. Click level 2. Notice the totals for all store locations are displayed.

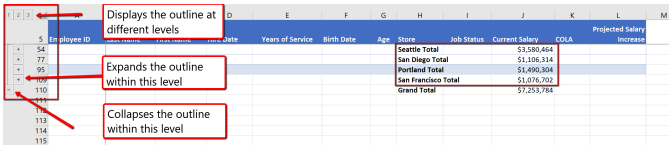


Figure 5.66 Subtotal Outline Level 2

ADDING A SUBTOTAL WITHIN A SUBTOTAL

As mentioned at the beginning of the section, you can use multiple functions within the same subtotal. We will now explore how you can SUM Current Salary's and also provide the Average Current Salary for each Store location within the same Subtotal.

1. Click within the Subtotal data, go to the Outline, click Level 3, to display all the subtotal data.
2. From the Data tab, and click Subtotal.
3. In the Subtotal dialogue box, select the Store field for the "**At each change in:"** option.
4. In the "**Use function:"** section select to display the **Average**.
5. Only check the **Current Salary** field in the **"Add subtotal to section:"**. (Note Excel will default check something in this area. Uncheck any other fields.)
6. Uncheck **"Replace current subtotals"**; we do not want to replace the current subtotal summing the Current Salary.
7. Click OK

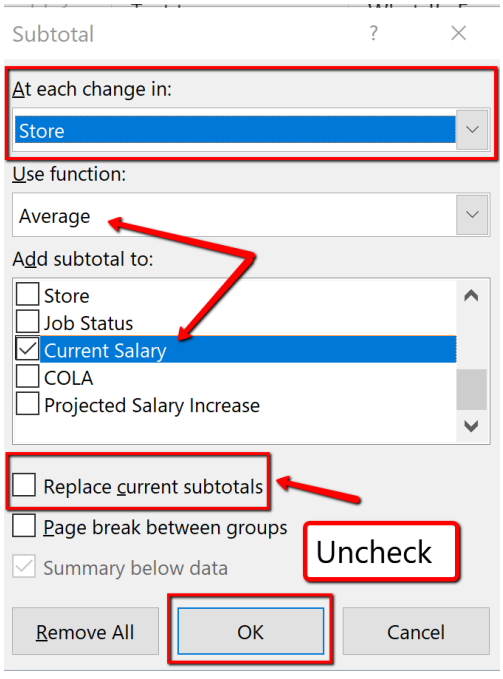
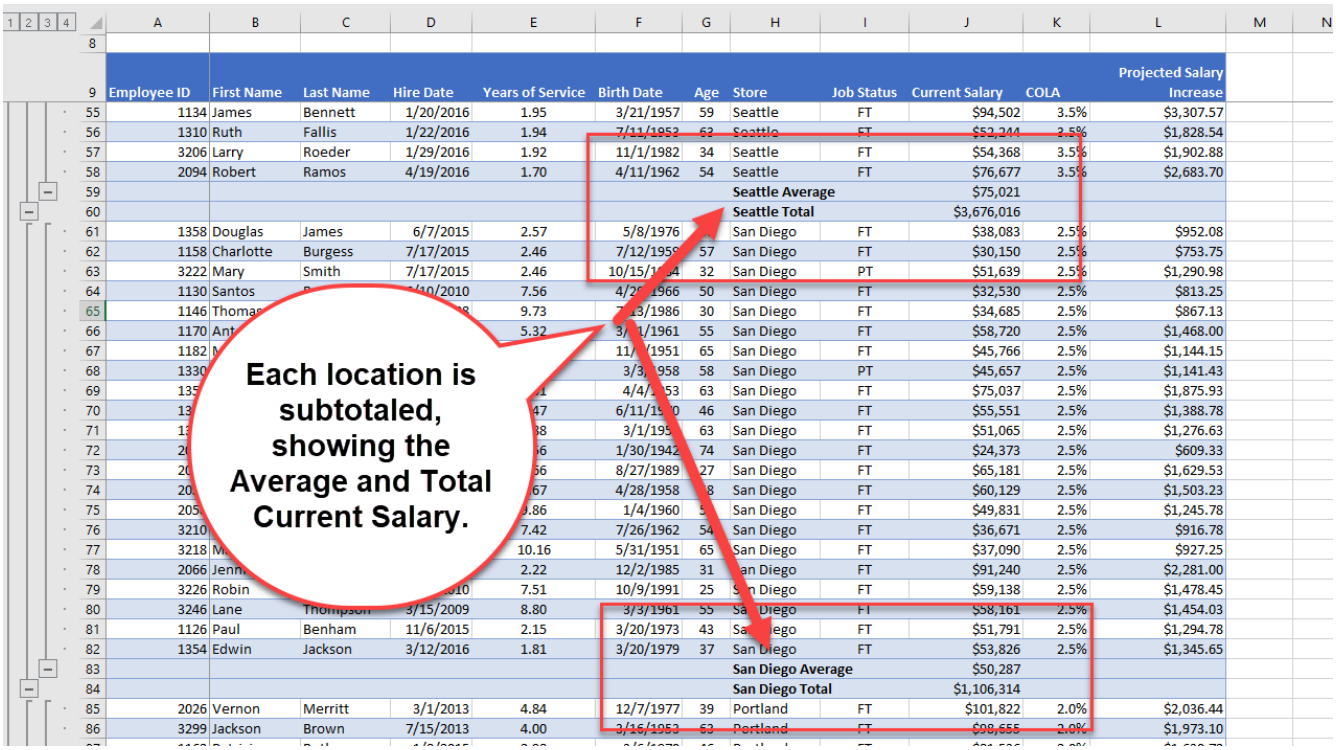


Figure 5.67 Subtotal Within A Subtotal

8. Notice each location is now subtotaled showing the Average and Total Current Salary. Excel has also added 4th level to the Outline, accounting for the Averages. Save your work.



	Employee ID	First Name	Last Name	Hire Date	Years of Service	Birth Date	Age	Store	Job Status	Current Salary	COLA	Projected Salary Increase
55	1134	James	Bennett	1/20/2016	1.95	3/21/1957	59	Seattle	FT	$94,502	3.5%	$3,307.57
56	1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,344	3.5%	$1,828.54
57	3206	Larry	Roeder	1/29/2016	1.92	11/1/1982	34	Seattle	FT	$54,368	3.5%	$1,902.88
58	2094	Robert	Ramos	4/19/2016	1.70	4/11/1962	54	Seattle	FT	$76,677	3.5%	$2,683.70
59								**Seattle Average**		$75,021		
60								**Seattle Total**		$3,676,016		
61	1358	Douglas	James	6/7/2015	2.57	5/8/1976		San Diego	FT	$38,083	2.5%	$952.08
62	1158	Charlotte	Burgess	7/17/2015	2.46	7/12/1959	57	San Diego	FT	$30,150	2.5%	$753.75
63	3222	Mary	Smith	7/17/2015	2.46	10/15/1984	32	San Diego	PT	$51,639	2.5%	$1,290.98
64	1130	Santos		/10/2010	7.56	4/2[illegible]1966	50	San Diego	FT	$32,530	2.5%	$813.25
65	1146	Thomas			9.73	7/13/1986	30	San Diego	FT	$34,685	2.5%	$867.13
66	1170	Ant			5.32	3/[illegible]1961	55	San Diego	FT	$58,720	2.5%	$1,468.00
67	1182	M				11/[illegible]1951	65	San Diego	FT	$45,766	2.5%	$1,144.15
68	1330					3/3/1958	58	San Diego	PT	$45,657	2.5%	$1,141.43
69	135				1	4/4/[illegible]53	63	San Diego	FT	$75,037	2.5%	$1,875.93
70	13				47	6/11/19[illegible]0	46	San Diego	FT	$55,551	2.5%	$1,388.78
71	1				8	3/1/195[illegible]	63	San Diego	FT	$51,065	2.5%	$1,276.63
72	2				6	1/30/1942	74	San Diego	FT	$24,373	2.5%	$609.33
73	2				6	8/27/1989	27	San Diego	FT	$65,181	2.5%	$1,629.53
74	20				67	4/28/1958	8	San Diego	FT	$60,129	2.5%	$1,503.23
75	205				9.86	1/4/1960	5	San Diego	FT	$49,831	2.5%	$1,245.78
76	3210				7.42	7/26/1962	54	San Diego	FT	$36,671	2.5%	$916.78
77	3218	M			10.16	5/31/1951	65	San Diego	FT	$37,090	2.5%	$927.25
78	2066	Jenn			2.22	12/2/1985	31	[illegible]an Diego	FT	$91,240	2.5%	$2,281.00
79	3226	Robin			7.51	10/9/1991	25	S[illegible]n Diego	FT	$59,138	2.5%	$1,478.45
80	3246	Lane	Thompson	3/15/2009	8.80	3/3/1961	55	Sa[illegible]Diego	FT	$58,161	2.5%	$1,454.03
81	1126	Paul	Benham	11/6/2015	2.15	3/20/1973	43	Sa[illegible]ego	FT	$51,791	2.5%	$1,294.78
82	1354	Edwin	Jackson	3/12/2016	1.81	3/20/1979	37	San Diego	FT	$53,826	2.5%	$1,345.65
83								**San Diego Average**		$50,287		
84								**San Diego Total**		$1,106,314		
85	2026	Vernon	Merritt	3/1/2013	4.84	12/7/1977	39	Portland	FT	$101,822	2.0%	$2,036.44
86	3299	Jackson	Brown	7/15/2013	4.00	3/16/1953	63	Portland	FT	$98,555	2.0%	$1,973.10

Figure 5.68 Solution, Subtotal Within A Subtotal

Key Takeaways

- A table is made up of a data set that is organized into columns and rows representing fields and records, such as employee information.
- You can create a table by clicking formatting the data set as a table, or using the Insert Table feature.
- Excel offers pre-built table styles, and options to choose from to format a table.
- You can add records (rows) and our fields (columns) to a table. You can then sort to reorganize your data.
- Freezing heading keeps your column headings displayed while you scroll through your table data.
- You can use the filter arrows in the table headings to sort by a single column. When sorting by more than one field, use the Custom Sort option.
- Custom List Sorts can be used when a field needs to be sorted in a special way.
- A slicer is a visual filter button (object) used to filter data in an Excel table. Each unique value

in the field is a button.

- A PivotTable is an interactive table that summarizes data from a data source such as a data range or an Excel table.
- The Subtotal tool includes summary statistics for each group of records. Excel organizes subtotals using an outline that can be expanded or contracted to view or hide details about the data.

5.3 Preparing to Print

Learning Objectives

1. Adjust page settings for printing.
2. Add footer information for user integrity.
3. Preview a worksheet, adjust settings to print in a professional manner.
4. Insert a 3D Model to enhance the visual appearance of a worksheet.

PREVIEWING A WORKSHEET

Although printing large data sets is uncommon, it is an industry curiosity to set up Excel workbooks to print correctly, and to also add documentation as to when data was revised. Follow the below steps to prepare the worksheets to print.

1. Click on the **AdvancedFilter** worksheet. At the bottom of the screen choose the Page Layout option.

Figure 5.67 Page Layout View

2. At the bottom of the page, click into the left section, of the Add Footer panel.

Figure 5.68 Footer Area Left Section

3. From the Header and Footer Design tab, choose to insert the Current Date field.

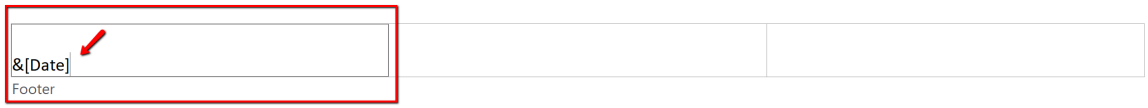


Figure 5.69 Date field in the Footer Area Left Section

4. Click in the right panel section, insert the File Name field.

Figure 5.70 File Name Footer Area Right Section

5. Click back into the spreadsheet to close the Header and Footer section, and choose the Normal page layout.

6. From the File tab, select Print. Change the Orientation to Landscape. In the Scaling section, choose **Fit Sheet on One Page.**

Mac Users: click the **"Scale to Fit" option**

7. Save your work. You don't have to actually print this sheet. Go back to your worksheet.

Follow the below steps to add a footer to indicate when the last update was made and apply settings to the **EmployeeData** worksheet to ensure it will print correctly if needed.

1. Click the EmployeeData worksheet. At the bottom of the screen choose the Page Layout option. You may get a message telling you that Page Layout and Freeze Panes are not compatible. You should click **OK** to remove the Freeze Panes setting.

2. At the bottom of the page, click into the left section, of the Add Footer panel type **Revision Date:** add a space, then click the **Current Date button from the Ribbon**. Example: Revision Date: 1/01/2020.

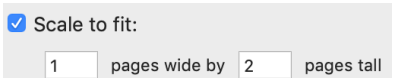
3. Click in the center panel, add the page number field.

4. Click in the right panel section, type **Revised by:** then type Y**our Name**. Example: Revised by: Jane Doe

5. Click back into the spreadsheet to close the Header and Footer section, and choose the Normal page layout.

6. From the File tab, select Print. Change the Margins to **Narrow**. In the Scaling section, choose **Fit All Columns on One Page.**

Mac Users: set the "**Scale to Fit**" option to **1 page wide by 2 pages tall**.



7. Save your work. Again, you do not have to print this sheet. Go back to the worksheet.

2054	Ruth	Olson	11/26/2004	13.10	10/4/1971	45	Seattle	FT	$64,845	3.5%	$2,269.58
2058	Angel	Palmer	2/22/2008	9.86	1/4/1960	56	San Diego	FT	$49,831	2.5%	$1,245.78
2062	Jose	Parham	12/4/2015	2.08	9/16/1970	46	Seattle	FT	$76,706	3.5%	$2,684.71
2066	Jennifer	Patterson	10/12/2015	2.22	12/2/1985	31	San Diego	FT	$91,240	2.5%	$2,281.00
2070	James	Pearce	12/4/2015	2.08	5/9/1959	57	Portland	FT	$96,282	2.0%	$1,925.64

Revision Date: (Type the Current Date) 1 Revised by: Student Name

Figure 5.65 Footer EmployeeData

INSERTING A 3D MODEL TO ENHANCE A WORKSHEET

Insert a 3D Model to the worksheet to enhance its appearance. In Excel, you can either insert Pictures, Shapes, Icons, SmartArt, Screenshots or 3D Models.

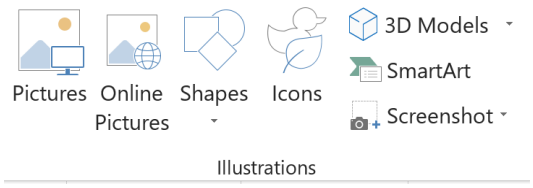
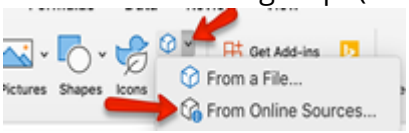


Figure 5.66 Illustrations Group

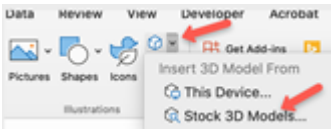
In this example, we will insert (from online) a 3D Model that looks like the Seattle Space Needle.

1. Click the Advanced Filter sheet tab, then click the Insert tab on the ribbon.

2. Click 3D Models button from the Illustrations group. (If necessary choose **From Online Sources or Stock 3D Models**.)



Mac Users: click the 3D Model icon button and then choose "**Stock 3D Models...**".



3. In the Search box type **Tower,** and hit **Enter** from the keyboard.

4. From the results window, choose a model that looks like the Space Needle. And click Insert. **Again, if the Space Needle is not available in the gallery, click the Back arrow and find an alternate building or tower from the 3D Model "Buildings" category.**

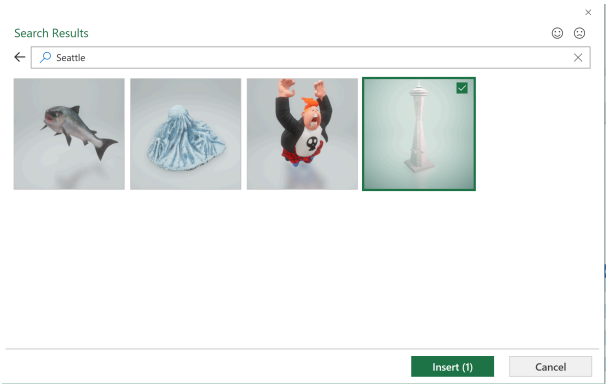


Figure 5.67 3D Model Search Box

5. Notice the model can be manipulated 360 degrees tilted up and down to show a specific feature of the object. Adjust based on your preference.

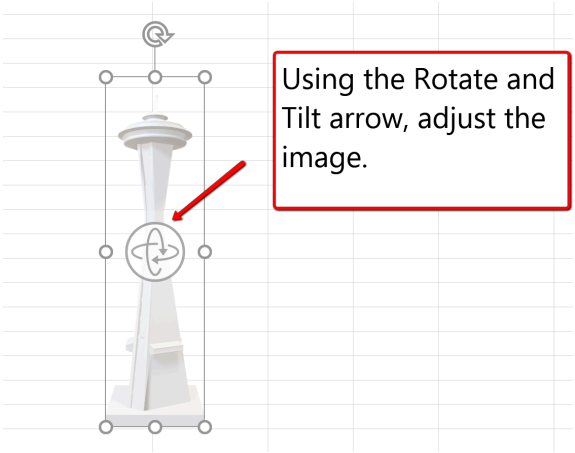


Figure 5.68 3D Model Image

6. Place, and resize the image to the upper left-hand corner of the sheet, above the last column of data. Make sure it does not overlap on the table.

7. Check the spelling on all of the worksheets and make any necessary changes. Save your work. Submit **CH5 HR Report** as directed by your instructor.

WCM Analytics
Advanced Filter Criteria
Seattle & San Diego Current Salaries

Store	Job Status	Current Salary	Current Salary
Seattle	FT	>=50000	<=60000
San Diego	FT	>=70000	<=80000

Employee ID	First Name	Last Name	Hire Date	Years of Servic	Birth Date	Age	Store	Job Statu	Current Salary	COLA	Projected Salary Increa
1350	Patrice	Hutton	12/29/2009	6.01	4/4/1953	63	San Diego	FT	$75,037	2.5%	$1,875.93
1310	Ruth	Fallis	1/22/2016	1.94	7/11/1953	63	Seattle	FT	$52,244	3.5%	$1,828.54
1394	Shanika	Lloyd	8/24/2004	13.36	8/11/1966	50	Seattle	FT	$53,186	3.5%	$1,861.51
3206	Larry	Roeder	1/29/2016	1.92	11/1/1982	34	Seattle	FT	$54,368	3.5%	$1,902.88
3214	Robert	Ross	8/28/2015	2.35	9/24/1974	42	Seattle	FT	$58,309	3.5%	$2,040.82
3242	Charles	Taylor	2/5/2012	3.90	1/18/1947	69	Seattle	FT	$58,291	3.5%	$2,040.19
3258	Johnny	Vazquez	9/18/2006	11.29	6/16/1953	63	Seattle	FT	$52,125	3.5%	$1,824.38

Figure 5.69 3D Model Solution

Key Takeaways

- When working with Excel workbooks, the final step should always be to review the worksheets in Print Preview to make sure they are printing appropriately.
- You can add images you have saved, or images you find online, to a worksheet to enhance its

appearance. Be sure to resize and move them appropriately so they do not detract from the data.

ATTRIBUTION

5.4 Chapter Practice

TABLES FOR A TOURISM COMPANY

Download Data File: PR5 Data

Travel and tour companies need to keep track of client data, as well as, travel/tour options and tour guides. Keeping up-to-date, accurate records is essential to their bottom line. To run a tour company, employees must be able to manipulate their data quickly and easily. This exercise illustrates how to use the skills presented in this chapter to generate the data needed on a daily basis by a tourism company.

1. Open the data file **PR5 Data** and save the file to your computer as **PR5 Canyon Trails**.
2. Click Sheet 1. Choose cell B3.
3. From the Home tab, choose Format as Table. Choose the Orange, Table Style Medium 3.
4. In J4, calculate Total Cost (number of Guests *Per Person Cost). Note Excel will add the formula to the entire column. (If prompted, choose to overwrite the formula to the cells below.)
5. Format Columns I and J with Accounting format, no decimal places.
6. Center all headings in Row 3.
7. Adjust column widths within the table so that all the headings are completely visible.
8. Rename Sheet 1 **Current Tours**. Sort this sheet alphabetically (A to Z) by Last Name.

Tours By Canyon

First Name	Last Name	Guests	Average Age	Home Country	Tour Canyon	Tour State	Days	Per Person Cost	Total Cost
Santos	Albert	2	58	Brazil	Grand Canyon National Park	Arizona	5	550	$ 1,100
Ian	Armstrong	2	62	United States	Cedar Breaks National Monument	Utah	5	550	$ 1,100
Laurie	Black	2	66	Canada	Fall Canyon Death Valley National Park	California	7	900	$ 1,800
Richard	Branson	2	65	United Kingdom	Zion National Park	Utah	7	900	$ 1,800
Vanessa	Burleigh	4	30	United Kingdom	Grand Canyon National Park	Arizona	7	900	$ 3,600
Jim	Carrey	1	54	Canada	Canyon de Chelly National Monument	Arizona	5	550	$ 550
Jennifer	Connelly	2	45	United States	Canyon de Chelly National Monument	Arizona	5	550	$ 1,100
Ellen	Cronan	2	68	Canada	Bryce Canyon National Park	Utah	7	900	$ 1,800
James	Doug	2	50	United Kingdom	Zion National Park	Utah	7	900	$ 1,800
Marianne	Eliot	2	50	United States	Yellowstone National Park	Wyoming	5	550	$ 1,100
Jonas	Finamore	2	45	United Kingdom	Yellowstone National Park	Wyoming	3	450	$ 900
James	Gardipee	1	46	United States	Grand Canyon National Park	Arizona	5	550	$ 550
Sharon	Glatz	2	63	Australia	Cedar Breaks National Monument	Utah	3	450	$ 900
Sofia	Guthenberg	1	60	Canada	Glen Canyon National Recreation Area	Arizona	3	450	$ 450
Yoko	Hanamoto	2	29	Japan	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Charles	Hector	2	56	United States	Zion National Park	Utah	7	900	$ 1,800
Scarlett	Johansson	3	31	United States	Fall Canyon Death Valley National Park	California	7	900	$ 2,700
Sally	Kee	4	57	Canada	Glen Canyon National Recreation Area	Arizona	3	450	$ 1,800
Frank	Kee	3	58	United States	Zion National Park	Utah	7	900	$ 2,700
Rosella	Kim	2	40	United States	Zion National Park	Utah	7	900	$ 1,800
Deborah	Klein	2	65	Germany	Fall Canyon Death Valley National Park	California	5	550	$ 1,100
Nick	Kopec	2	65	United Kingdom	Black Canyon of the Gunnison National Park	Colorado	5	550	$ 1,100
Grace	Kruger	2	56	Germany	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Erik	Laarson	2	63	Canada	Black Canyon of the Gunnison National Park	Colorado	5	550	$ 1,100
Samuel	Larocca	2	59	Brazil	Cedar Breaks National Monument	Utah	7	900	$ 1,800

Figure 5.70 Current Tours

9. Make a copy of the Current Tours sheet and rename it **Tours by Canyon**. One way to make a copy of a worksheet is to right-click on the worksheet tab (**Mac Users**: Ctrl+click) and select Move or Copy. Be sure to check the **Create a Copy** box. Place the Tours by Canyon sheet to the right of the Current Tours sheet.

10. Sort the Tours by Canyon sheet by **Tour Canyon, Home Country,** and then **Last Name** all in Ascending order (A to Z).

Tours By Canyon

First Name	Last Name	Guests	Average Age	Home Country	Tour Canyon	Tour State	Days	Per Person Cost	Total Cost
Erik	Laarson	2	63	Canada	Black Canyon of the Gunnison National Park	Colorado	5	550	$ 1,100
Grace	Kruger	2	56	Germany	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Ingrid	Schultz	2	57	Germany	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Yoko	Hanamoto	2	29	Japan	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Nick	Kopec	2	65	United Kingdom	Black Canyon of the Gunnison National Park	Colorado	5	550	$ 1,100
Analise	Wendle	2	58	United States	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Brian	Lawson	2	66	Australia	Bryce Canyon National Park	Utah	5	550	$ 1,100
Ellen	Cronan	2	68	Canada	Bryce Canyon National Park	Utah	7	900	$ 1,800
Miguel	Piggott	2	70	United Kingdom	Bryce Canyon National Park	Utah	7	900	$ 1,800
Skye	Quillin	2	45	United States	Bryce Canyon National Park	Utah	7	900	$ 1,800
Gil	Thompson	1	62	United States	Bryce Canyon National Park	Utah	7	900	$ 900
Darlene	Welsh	2	63	United States	Bryce Canyon National Park	Utah	5	550	$ 1,100
Jim	Carrey	1	54	Canada	Canyon de Chelly National Monument	Arizona	5	550	$ 550
Jennifer	Connelly	2	45	United States	Canyon de Chelly National Monument	Arizona	5	550	$ 1,100
Alfred	Yankovic	2	56	United States	Canyon de Chelly National Monument	Arizona	7	900	$ 1,800
Sharon	Glatz	2	63	Australia	Cedar Breaks National Monument	Utah	3	450	$ 900
Samuel	Larocca	2	59	Brazil	Cedar Breaks National Monument	Utah	7	900	$ 1,800
John	Lawrence	2	52	Canada	Cedar Breaks National Monument	Utah	7	900	$ 1,800
Omar	Rafael	2	59	United Kingdom	Cedar Breaks National Monument	Utah	3	450	$ 900
Ian	Armstrong	2	62	United States	Cedar Breaks National Monument	Utah	5	550	$ 1,100
Laurie	Black	2	66	Canada	Fall Canyon Death Valley National Park	California	7	900	$ 1,800
Jolene	Terry	2	67	Canada	Fall Canyon Death Valley National Park	California	7	900	$ 1,800
Deborah	Klein	2	65	Germany	Fall Canyon Death Valley National Park	California	5	550	$ 1,100
Scarlett	Johansson	3	31	United States	Fall Canyon Death Valley National Park	California	7	900	$ 2,700
Sofia	Guthenberg	1	60	Canada	Glen Canyon National Recreation Area	Arizona	3	450	$ 450
Sally	Kee	4	57	Canada	Glen Canyon National Recreation Area	Arizona	3	450	$ 1,800

Figure 5.71 Tours by Canyon

11. Make another copy of the Current Tours sheet and rename it **US Guests**. Place the US Guests sheet to the right of the Tours by Canyon sheet.

12. Filter the **US Guests** sheet to display customers who live in the United States. Sort the filtered data alphabetically (A to Z) by Tour State. Add a Total Row that sums the Guests and Total Cost columns.

Tours By Canyon

First Name	Last Name	Guests	Average Age	Home Country	Tour Canyon	Tour State	Days	Per Person Cost	Total Cost
Jennifer	Connelly	2	45	United States	Canyon de Chelly National Monument	Arizona	5	550	$ 1,100
James	Gardipee	1	46	United States	Grand Canyon National Park	Arizona	5	550	$ 550
Vince	Shad	3	69	United States	Grand Canyon National Park	Arizona	7	900	$ 2,700
Rod	Vanderzee	2	58	United States	Grand Canyon National Park	Arizona	7	900	$ 1,800
Alex	Wigham	2	70	United States	Grand Canyon National Park	Arizona	7	900	$ 1,800
Alfred	Yankovic	2	56	United States	Canyon de Chelly National Monument	Arizona	7	900	$ 1,800
Scarlett	Johansson	3	31	United States	Fall Canyon Death Valley National Park	California	7	900	$ 2,700
Analise	Wendle	2	58	United States	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Ian	Armstrong	2	62	United States	Cedar Breaks National Monument	Utah	5	550	$ 1,100
Charles	Hector	2	56	United States	Zion National Park	Utah	7	900	$ 1,800
Frank	Kee	3	58	United States	Zion National Park	Utah	7	900	$ 2,700
Rosella	Kim	2	40	United States	Zion National Park	Utah	7	900	$ 1,800
Skye	Quillin	2	45	United States	Bryce Canyon National Park	Utah	7	900	$ 1,800
Gil	Thompson	1	62	United States	Bryce Canyon National Park	Utah	7	900	$ 900
Darlene	Welsh	2	63	United States	Bryce Canyon National Park	Utah	5	550	$ 1,100
Marianne	Eliot	2	50	United States	Yellowstone National Park	Wyoming	5	550	$ 1,100
Lucas	Lee	2	42	United States	Yellowstone National Park	Wyoming	3	450	$ 900
Sierra	Sloane	2	33	United States	Yellowstone National Park	Wyoming	7	900	$ 1,800
Total		**37**							**$ 29,250**

Figure 5.72 US Guests

13. Make another copy of the Current Tours sheet and rename it, **European Guests**. Place the European Guests sheet to the right of the US Guests sheet.

14. Insert a slicer in the **European Guests** sheet for Home Country. Move the top left corner of the slicer to the top left-hand corner of cell L3. Resize the slicer so all buttons display. Format the slicer to match the table.

15. Using the slicer, filter the data to display customers from Germany and the United Kingdom.

16. Sort the filtered data by the Home Country, and Last Name fields displaying both in Ascending order (A to Z).

Tours By Canyon

First Name	Last Name	Guests	Average Age	Home Country	Tour Canyon	Tour State	Days	Per Person Cost	Total Cost
Deborah	Klein	2	65	Germany	Fall Canyon Death Valley National Park	California	5	550	$ 1,100
Grace	Kruger	2	56	Germany	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Pat	Rhinehart	2	73	Germany	Grand Canyon National Park	Arizona	7	900	$ 1,800
Ingrid	Schultz	2	57	Germany	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Richard	Branson	2	65	United Kingdom	Zion National Park	Utah	7	900	$ 1,800
Vanessa	Burleigh	4	30	United Kingdom	Grand Canyon National Park	Arizona	7	900	$ 3,600
James	Doug	2	50	United Kingdom	Zion National Park	Utah	7	900	$ 1,800
Jonas	Finamore	2	45	United Kingdom	Yellowstone National Park	Wyoming	3	450	$ 900
Nick	Kopec	2	65	United Kingdom	Black Canyon of the Gunnison National Park	Colorado	5	550	$ 1,100
Anna	Macpherson	2	38	United Kingdom	Yellowstone National Park	Wyoming	7	900	$ 1,800
Miguel	Piggott	2	70	United Kingdom	Bryce Canyon National Park	Utah	7	900	$ 1,800
Omar	Rafael	2	59	United Kingdom	Cedar Breaks National Monument	Utah	3	450	$ 900
Indira	Singh	2	55	United Kingdom	Glen Canyon National Recreation Area	Arizona	7	900	$ 1,800

Figure 5.73 European Guests

17. Click the Advanced Filter sheet. Using the Advanced Filter option, filter the Current Tours table based on the criteria given. Determine how many guests from Canada are taking tours in Arizona and Utah between the costs indicated in the criteria table. Place the results in A10.

18. Turn the results into a table. Format the table to match the criteria area. Turn on the total row and show the Sum of the Total Cost column.

Tours By Canyon

Tour State	Home Countr	Total Cost	Total Cost
Arizona	Canada	>=1350	<=2750
Utah	Canada	>=500	<=6300

First Nam	Last Nam	Guest	Average Ag	Home Countr	Tour Canyo	Tour Stat	Days	Per Person Cos	Total Cos
Ellen	Cronan	2	68	Canada	Bryce Canyon N	Utah	7	900	$ 1,800
Sally	Kee	4	57	Canada	Glen Canyon Na	Arizona	3	450	$ 1,800
John	Lawrence	2	52	Canada	Cedar Breaks Na	Utah	7	900	$ 1,800
Total									**$ 5,400**

Figure 5.74 Advanced Filter

19. Select the Current Tours sheet. Click in the table area and insert a PivotTable as a new sheet. Name the sheet **ToursPT.** Run a report to show the Total Cost per Home Country, for each available Tour States. Format the numbers in currency format, zero decimal places. Choose a PivotStyle format to match the current orange theme.

Sum of Total Cost	Column Labels					
Row Labels	Arizona	California	Colorado	Utah	Wyoming	Grand Total
Australia	$1,800			$2,000	$2,200	$6,000
Brazil	$2,900			$1,800		$4,700
Canada	$3,900	$3,600	$1,100	$3,600	$2,200	$14,400
Germany	$1,800	$1,100	$3,600			$6,500
Japan			$1,800	$1,800		$3,600
United Kingdom	$5,400		$1,100	$6,300	$2,700	$15,500
United States	$9,750	$2,700	$1,800	$11,200	$3,800	$29,250
Grand Total	**$25,550**	**$7,400**	**$9,400**	**$26,700**	**$10,900**	**$79,950**

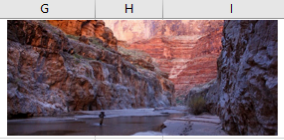
Figure 5.75 ToursPT

20. Make one more copy of the Current Tours sheet and rename it **Tours by State**. Place the Tours by State sheet to the right of the European Guests sheet. Go to the Table Tools and turn off the Banded Rows.

21. Subtotal the data by State, summing the Total Cost column. (**Note:** Remember to follow the four rules of subtotaling!)

22. After you subtotal, turn on filters and filter out 3-day tours in the table.

Tours By Canyon



First Name	Last Name	Guests	Average Age	Home Country	Tour Canyon	Tour State	Days	Per Person Cost	Total Cost
Santos	Albert	2	58	Brazil	Grand Canyon National Park	Arizona	5	550	$ 1,100
Vanessa	Burleigh	4	30	United Kingdom	Grand Canyon National Park	Arizona	7	900	$ 3,600
Jim	Carrey	1	54	Canada	Canyon de Chelly National Monument	Arizona	5	550	$ 550
Jennifer	Connelly	2	45	United States	Canyon de Chelly National Monument	Arizona	5	550	$ 1,100
James	Gardipee	1	46	United States	Grand Canyon National Park	Arizona	5	550	$ 550
Leonora	Maag	2	45	Brazil	Grand Canyon National Park	Arizona	7	900	$ 1,800
Raymond	Mah	2	55	Canada	Grand Canyon National Park	Arizona	5	550	$ 1,100
Pat	Rhinehart	2	73	Germany	Grand Canyon National Park	Arizona	7	900	$ 1,800
Vince	Shad	3	69	United States	Grand Canyon National Park	Arizona	7	900	$ 2,700
Indira	Singh	2	55	United Kingdom	Glen Canyon National Recreation Area	Arizona	7	900	$ 1,800
Rod	Vanderzee	2	58	United States	Grand Canyon National Park	Arizona	7	900	$ 1,800
Alex	Wigham	2	70	United States	Grand Canyon National Park	Arizona	7	900	$ 1,800
Alfred	Yankovic	2	56	United States	Canyon de Chelly National Monument	Arizona	7	900	$ 1,800
						Arizona Total			$ 21,500
Laurie	Black	2	66	Canada	Fall Canyon Death Valley National Park	California	7	900	$ 1,800
Scarlett	Johansson	3	31	United States	Fall Canyon Death Valley National Park	California	7	900	$ 2,700
Deborah	Klein	2	65	Germany	Fall Canyon Death Valley National Park	California	5	550	$ 1,100
Jolene	Terry	2	67	Canada	Fall Canyon Death Valley National Park	California	7	900	$ 1,800
						California Total			$ 7,400
Yoko	Hanamoto	2	29	Japan	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Nick	Kopec	2	65	United Kingdom	Black Canyon of the Gunnison National Park	Colorado	5	550	$ 1,100
Grace	Kruger	2	56	Germany	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Erik	Laarson	2	63	Canada	Black Canyon of the Gunnison National Park	Colorado	5	550	$ 1,100
Ingrid	Schultz	2	57	Germany	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
Analise	Wendle	2	58	United States	Black Canyon of the Gunnison National Park	Colorado	7	900	$ 1,800
						Colorado Total			$ 9,400

Figure 5.76 Subtotal

23. On each worksheet, make the following print setup changes:

    a) Add a footer with the **current date, worksheet name**, and your name.

    b) Change to Landscape Orientation

    c) Set the scaling to Fit All Columns on One Page

    d) For any worksheets that print on more than one page, add **Print Titles** to repeat the first three rows at the top of each page.

24. Check the spelling on all of the worksheets and make any necessary changes. Save the **PR5 Canyon Trails** workbook. Submit the **PR5 Canyon Trails** workbook as directed by your instructor.

ATTRIBUTION

5.5 Scored Assessment

TABLES FOR A RETAIL COMPANY

Download Data File: SC5 Data

Retail companies with today's online, as well as, in-store sales have a lot of data to keep track of! Keeping track of sales, costs, and profits on a daily basis is essential to making the most of a business. This exercise illustrates how to use the skills presented in this chapter to generate the data needed on a daily basis by a retail company.

1. Open the data file **SC5 Data** and save the file to your computer as **SC5 Dynamite Customer Sales**.

2. Click the **Sales** Sheet. Format the data set as a table. Choose a style from the styles gallery.

3. Create the following calculated columns.

    a) In I4, and J4, use a VLOOKUP function that will look up the **Product Price** and **Product Cost** based on the **Product Sold** column which lists an ID number. [Hint: The Product Table sheet lists the Price and Cost] If any error messages appear, check the Range Lookup.

    b) In K4, use a formula to calculate Profit. **Hint:** Profit =(Product Price-Product Cost)*Units Sold

4. Format columns I, J, and K as currency with two decimal places.

5. Make a copy of the **Sales** sheet and rename it **Online Sales by Date**. Place this sheet to the right of the Sales sheet. Answer the following question by filtering the data accordingly. **What was the total Profit for Online Sales?** Sort the results by Date Sold (A/Z).

6. Make a copy of the **Sales** sheet and rename it **June Sales by Country**. Place this new sheet to the right of the Online Sales by Date sheet. Answer the following question by filtering the data accordingly. **In June, for all products sold, what was the total profit earned?** Sort the results by Country, then Name both in (A/Z).

7. Make another copy of the **Sales** sheet and rename it **Sales by Product**. Place this new sheet to the right of the June Sales by Country sheet. Using a slicer, filter the data accordingly to display the **average** Product Price, Product Cost, and Profit for DETA100 and DETA200 items. Sort the filtered sheet by Product Sold. [Hint: In the total row make sure to type the word **Average** in column A.]

8. Make one final copy of the **Sales** sheet and rename it **Subtotals by Sales Type**. Place this new sheet to the right of the Sales by Product sheet. Subtotal the sheet by Sales Type, summing the Profit column.

9. Add a 2nd subtotal to the **Subtotals by Type** sheet that subtotals by Sales Type and averages the Profit column.

10. From the **Sales** sheet, create the below PivotTable totaling per product type the Product Cost for Online and Retail sales. Insert the PivotTable as a new sheet. Name the sheet **ProductPT**.

Sum of Product Cost	Column Labels		
Row Labels	Online	Retail	Grand Total
DETA100	$ 159.00		$ 159.00
DETA200	$ 127.00	$ 63.50	$ 190.50
DETA800	$ 608.00		$ 608.00
PURA100	$ 86.00	$ 21.50	$ 107.50
PURA200	$ 168.00		$ 168.00
PURA250	$ 64.60	$ 32.30	$ 96.90
PURA500	$ 67.00		$ 67.00
SUPA101	$ 61.20		$ 61.20
SUPA102	$ 25.00		$ 25.00
SUPA103	$ 54.00		$ 54.00
SUPA104	$ 60.00	$ 15.00	$ 75.00
SUPA105	$ 90.00	$ 18.00	$ 108.00
Grand Total	**$ 1,569.80**	**$150.30**	**$ 1,720.10**

Figure 5.77 ProductPT

11. For each worksheet, add a footer with the **worksheet name** in the center and **your name** in the right panel.

12. Preview each worksheet in Print Preview and make any necessary changes for professional printing. *(Hint: Orientation, page scaling, and print titles might need to be used.)*

13. Check the spelling on all of the worksheets and make any necessary changes. Save the **SC5 Dynamite Customer Sales** workbook, and submit the file as directed by your instructor.

ATTRIBUTION

CHAPTER 6 – MULTIPLE SHEET FILES

Excel workbooks often contain a large amount of data, and worksheets can quickly become overwhelming. When one worksheet becomes cumbersome, data can be broken out into smaller subsets and placed in separate worksheets within the same Excel file. Separating out spreadsheet data into smaller pieces can lead to better data organization within a file and increase its ease of use. When a retail company needs to track overall sales, as well as, individual store sales, it makes sense to place each store's sales data in a separate sheet within a file. Adding a summary sheet that sums across all the sheets will allow for total company sales data in the same file. This chapter will show how to set up a workbook to make multi-sheet formulas quick and easy.

Other examples of when multiple sheets make the most sense are when you are comparing regional data for a salesforce and wish to evaluate individual salesperson performance along with overall sales, and data over a period of time where sheets can be broken out by year or by month. When comparing data across several sheets, it is essential that all the sheets are laid out in the same way. To facilitate this, a template can be used. A template is the basic pattern for each new sheet that can be used repeatedly to make sure each new sheet has the same setup, formatting, formulas, etc. as the existing sheets in a file. In this chapter, we will use both pre-made, Microsoft Excel templates, as well as, ones we will create from scratch to meet the specific needs of our work.

ATTRIBUTION

6.1 Multiple Sheet Basics

Learning Objectives

1. Navigating through a multiple sheet file.
2. Adding, deleting, copying, and moving sheets.
3. Grouping and ungrouping sheets.

Throughout our textbook, we have worked with Excel files that have included multiple sheets. Depending on the version of Excel you are using, a new Excel file may start with one or several sheets. In this chapter, we will be working with a personal budget file that contains income and expenses for an entire year. Our file contains a sheet for each month of the year, as well as, a Summary sheet that will add all twelve monthly sheets of data together. To begin with, we'll get comfortable with moving through the sheets, organizing them, and making sure that all twelve monthly sheets are consistent.

Figure 6.1 shows the January sheet in the Personal Budget file along with all the sheet tabs along the bottom of the window.

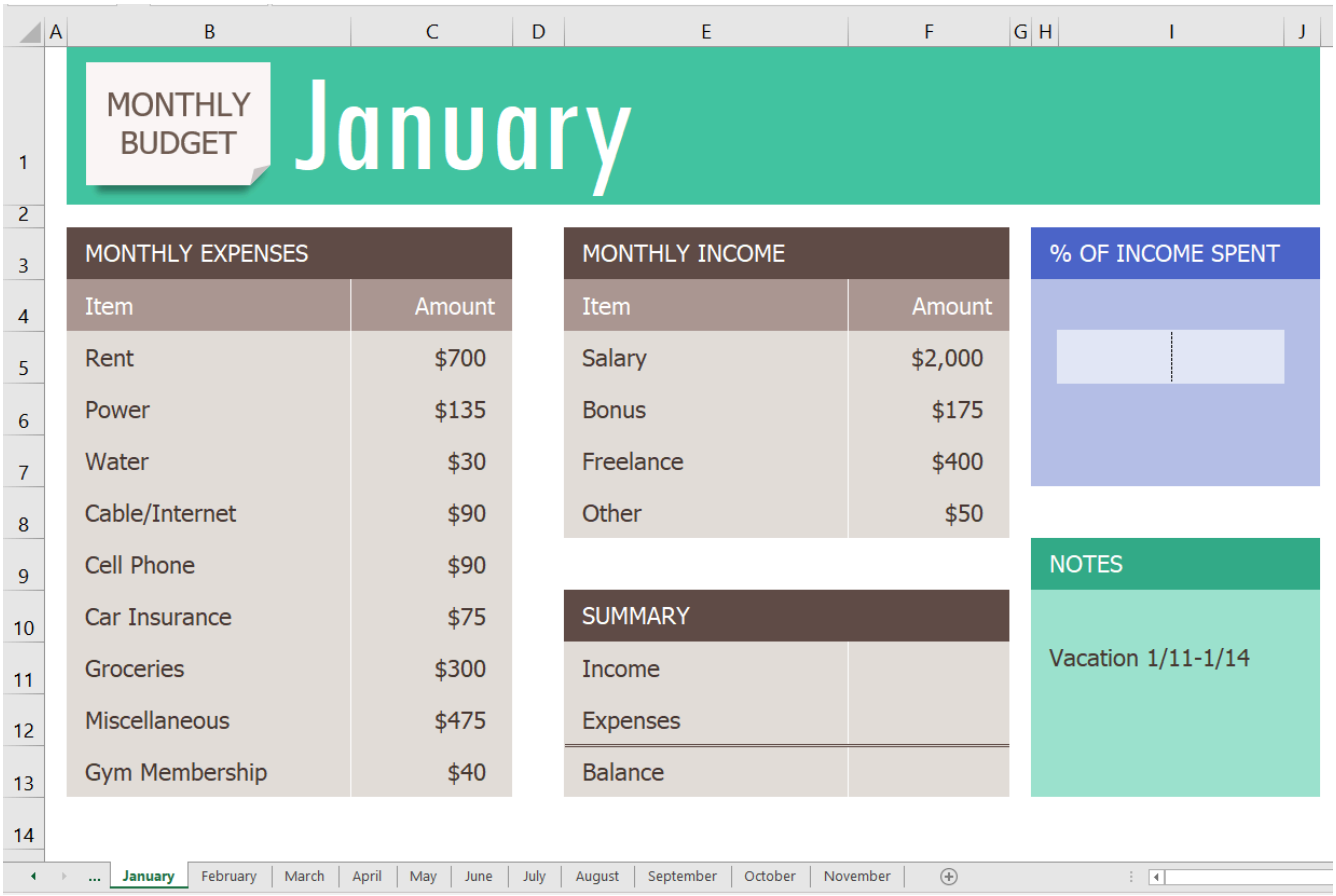


Figure 6.1 Personal Budget File

NAVIGATING THROUGH A MULTIPLE SHEET FILE

Download Data file: CH6 Data

1. Open the data file **CH6 Data** and save the file to your computer as **CH6 Personal Budget**. Notice that the file has an **Expenses Summary** sheet at the far left followed by monthly sheets.

2. Click on the different sheets at the bottom of the screen to move through the sheets. Notice that the **Expenses Summary** sheet is formatted differently from the monthly sheets. Notice also that all the monthly sheets are identical in layout and format.

3. Take a second look at the months at the end of the year. Not all the data has been entered for September through November… and there is no sheet for December. We will enter the remaining data and add an additional sheet for December.

4. Add the following data in the **September, October, and November** sheets:

	September	October	November
Power	$135	$135	$135
Water	$30	$30	$30
Groceries	$300	$325	$400
Miscellaneous	$100	$50	$100
Bonus			
Freelance	$500		$150
Other		$100	

COPYING A SHEET

1. To make a **December** sheet, we are going to copy the **November** sheet.
2. Point your mouse at the **November** sheet tab at the bottom of the screen.
3. Hold down your left mouse button and then press and hold down the CTRL key.

   Mac Users: hold down your left button while pointing at the **November** sheet tab and then press and hold down the **Option (alt) key**
4. At this point, you will see a black down-pointing arrow to the left of the **November** sheet tab and your mouse cursor will become a small piece of paper with a plus sign on it.
5. Drag your mouse to the right (still holding down the left-mouse button and the CTRL key) until the black down-pointing arrow is to the right of the **November** sheet tab.
6. Let go of the mouse button and then the CTRL key. You should now have a **November (2)** sheet to the right of the **November** sheet as shown in **Figure 6.2**.

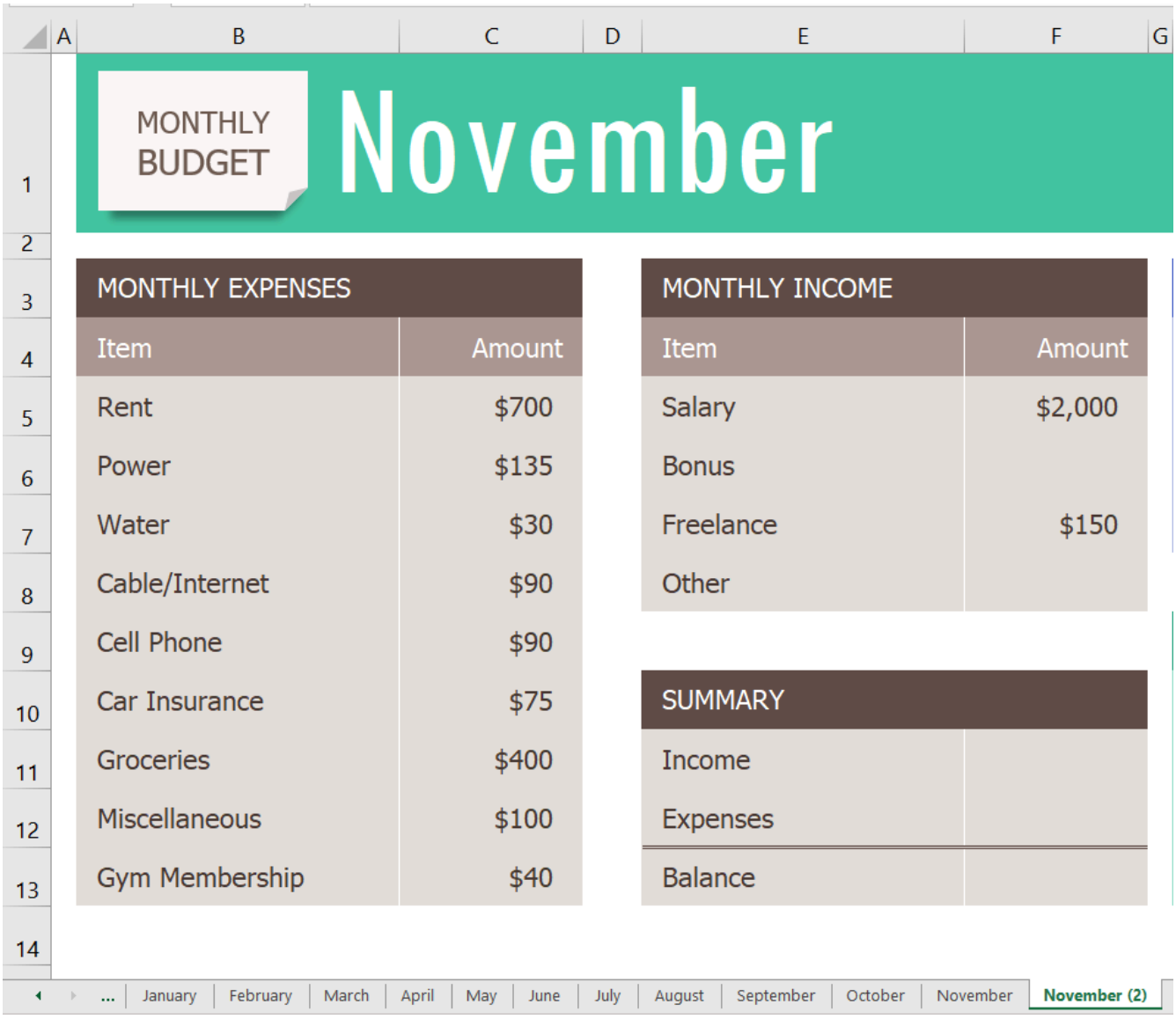


Figure 6.2 Additional November Sheet

Next, we'll update the **November (2)** sheet to turn it into our **December** sheet.

1. Right-click on the November (2) sheet name at the bottom of the screen and choose Rename.
   Mac Users: hold down the **Ctrl key** and click the November (2) sheet name. Choose Rename
2. Type "December" and press Enter.
   Note for all users: you can also double-click a sheet tab name to rename it.
3. Click on the December sheet.
4. Click on B1 and change "November" to "December". Be careful not to click on the "Monthly Budget" image.
5. Make the following data changes:

- Miscellaneous: **$300**
- Bonus: **$250** (it's the holidays!)
- Freelance: delete amount

6. Save your work.
7. Point your mouse at the **December** sheet tab at the bottom of the screen.
8. Hold down your left mouse button and then press and hold down the CTRL key (**Mac Users** hold down **Option** key)
9. Drag your mouse to the right (still holding down the left-mouse button and the CTRL key) until the black down-pointing arrow is to the right of the **December** sheet.
10. Let go of the mouse button and then the CTRL key. You should now have a **December (2)** sheet to the right of the **December** sheet.
11. Rename the **December(2)** sheet **Practice**.

Skill Refresher

Copying a Sheet

1. Point your mouse at the **sheet you want to copy** at the bottom of the screen.
2. Hold down your left mouse button and then press and hold down the CTRL key (**Mac Users** hold down the **Option** key)
3. Drag your mouse to the right (still holding down the left-mouse button and the CTRL key) until the black down-pointing arrow is to the right of **your existing sheet**.
4. Let go of the mouse button and then the CTRL key. You should now have a **Sheetname (2)** to the right of the **original sheet**.
5. Rename the **Sheetname (2)** sheet as desired.

MOVING AND DELETING SHEETS

Sometimes your sheets do not end up in the right order, and you need to move them in order to fix this. Let's try moving our "Practice" sheet to see how this is done.

1. Point to the **Practice** sheet and hold down your left mouse button.
2. Notice this time that there is still a black arrow to the left of the **Practice** sheet, but the piece of paper is blank. It does not have a plus sign (+) because we are moving, instead of copying, the sheet.
3. Left-drag the mouse to the left until the black arrow marker is between the **October and**

November sheets.

4. Release the mouse button.
5. Try moving the **Practice** sheet back to the right of the **December** sheet.

Since our **Practice** sheet is not a sheet we will need in our Budget file, we'll go ahead and delete it now.

1. Right-click on the **Practice** sheet tab at the bottom of the screen.
   Mac Users hold down the **Ctrl key** and click the **Practice** sheet tab
2. Click Delete. **Figure 6.3** shows the warning message box that will appear on your screen. Your message box might look slightly different depending on the version of Excel you are using. It is important to note that you cannot Undo once you delete a sheet!

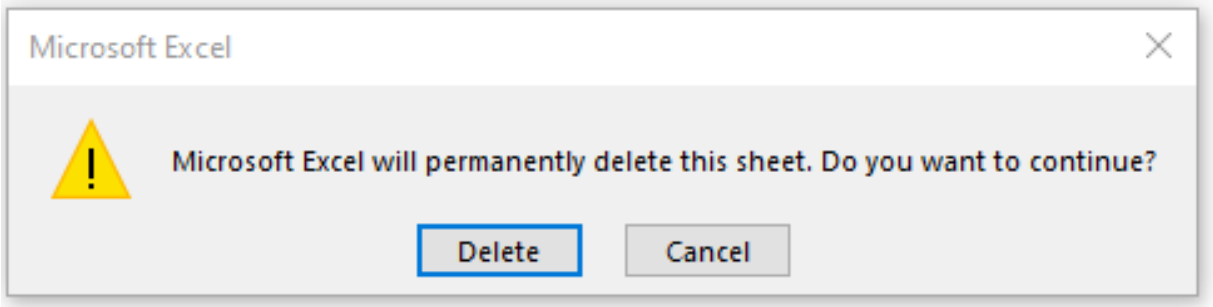


Figure 6.3 Warning Message Box

3. Click Delete.

GROUPING AND UNGROUPING SHEETS

Take a look at the monthly sheets again. Notice that there is a place in each of these sheets in the range F11:F13 to calculate three pieces of Summary data: Income, Expenses, and Balance; but there aren't any formulas in these cells. There is also a place for the % of Income Spent (in cell I5), but we will need to add a formula in I6:I7 to calculate this. If we entered these formulas individually in each of the 12 month sheets, it would take a long time! Because this task would be very repetitive, it would also be fairly likely that we would make some mistakes along the way entering the same formulas over and over again. By grouping all the month sheets together, we can enter each of the formulas once and have them appear in all the sheets.

1. Click on the **January** sheet to make it active.
2. Hold the SHIFT key down and click on the **December** sheet.

Now all 12 sheets should be selected. You can tell this in two ways: the sheet tabs that have been selected are now bold at the bottom of your screen. Also, notice in the Title bar at the top of the screen the word [Group] or – Group (depending on your version of Excel) added to the end of the title. You can see both of these in **Figure 6.4**.

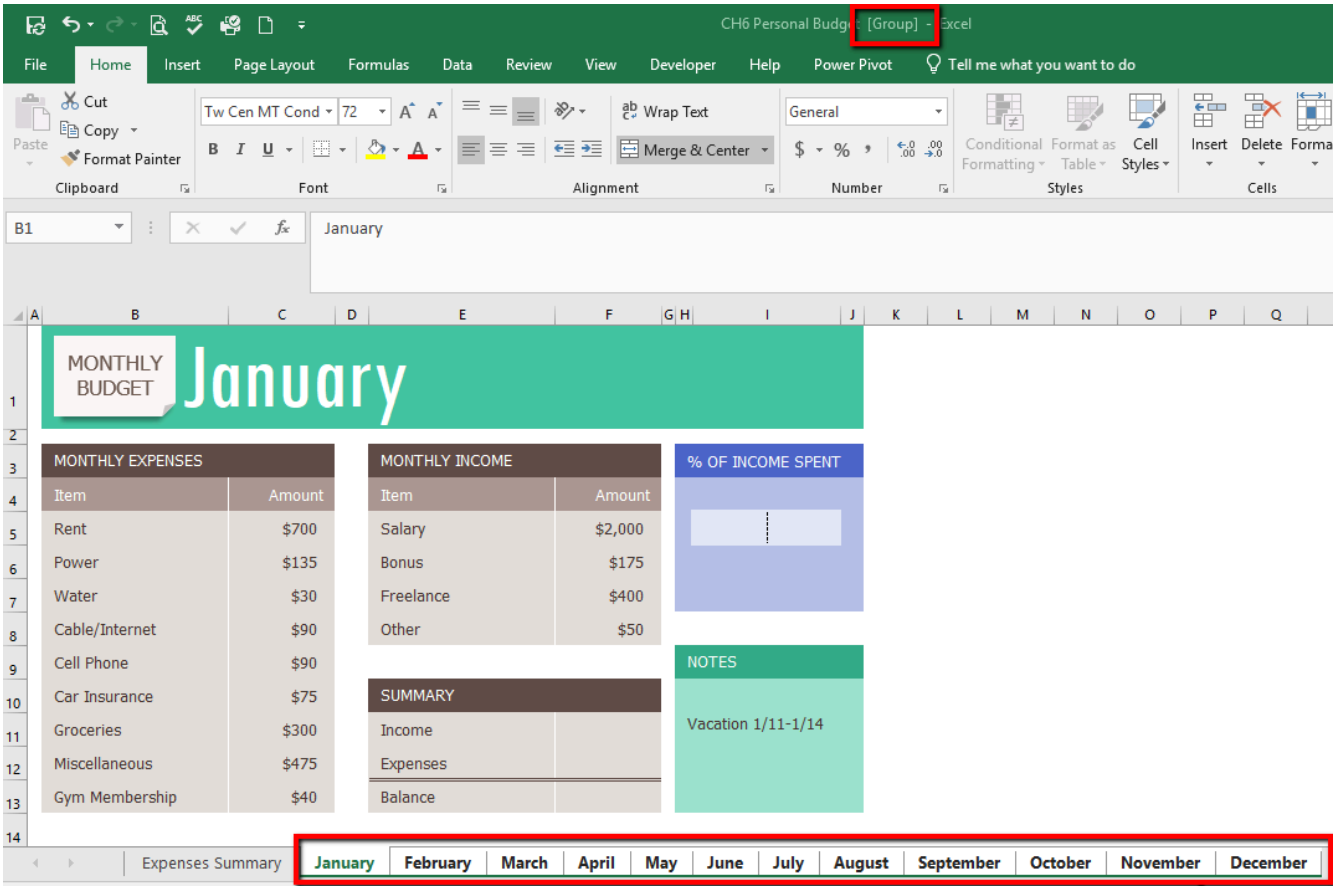


Figure 6.4 Grouped Sheets

IT IS IMPORTANT TO REMEMBER THAT ANY CHANGES WE MAKE TO THE JANUARY SHEET WILL BE MADE TO ALL THE SHEETS!! This is a very good thing when we want to make changes to all the sheets at once, but we need to be sure to ungroup them when we're done making these changes. Let's go ahead and add the formulas to all twelve of the sheets at once:

1. Click in F11 in the **January** grouped sheet.
2. Enter the formula **=SUM(F5:F8)**.
3. In F12, enter the formula **=SUM(C5:C13).**
4. In F13, subtract Expenses from Income. In the **January** sheet, your balance should be $690. HINT: if your answer is negative, you subtracted Income from Expenses.
5. Click on I6. (I6 and I7 are formatted and merged together – this is fine.)
6. Enter a formula that divides Expenses (F12) by Income (F11). Your answer will show as a percentage since this cell has already been formatted to do this. HINT: If you percentage is greater than 100%, you have your numbers reversed.

Notice that a data bar was set up in I5 to visually show the income spent. Do you remember how to do this from earlier in our textbook? Your January sheet should now look like **Figure 6.5**.

MONTHLY BUDGET

January

MONTHLY EXPENSES	
Item	Amount
Rent	$700
Power	$135
Water	$30
Cable/Internet	$90
Cell Phone	$90
Car Insurance	$75
Groceries	$300
Miscellaneous	$475
Gym Membership	$40

MONTHLY INCOME	
Item	Amount
Salary	$2,000
Bonus	$175
Freelance	$400
Other	$50

SUMMARY	
Income	$2,625
Expenses	$1,935
Balance	$690

% OF INCOME SPENT

74%

NOTES

Vacation 1/11-1/14

Figure 6.5 January Sheet with Formulas

7. Now that we are done making changes to all the monthly sheets at once, we need to ungroup them. Right-click on one of the grouped sheets and choose **Ungroup Sheets**.

Mac Users hold down **Ctrl** key click on one of the grouped sheets and choose **Ungroup Sheets.**

Notice the sheets tabs are no longer bold and the word [Group] is no longer in the title bar.

8. Click on several of the month sheets to see that all the formulas have been added.

9. Click on the **December** sheet. Your sheet should now look like Figure 6.6.

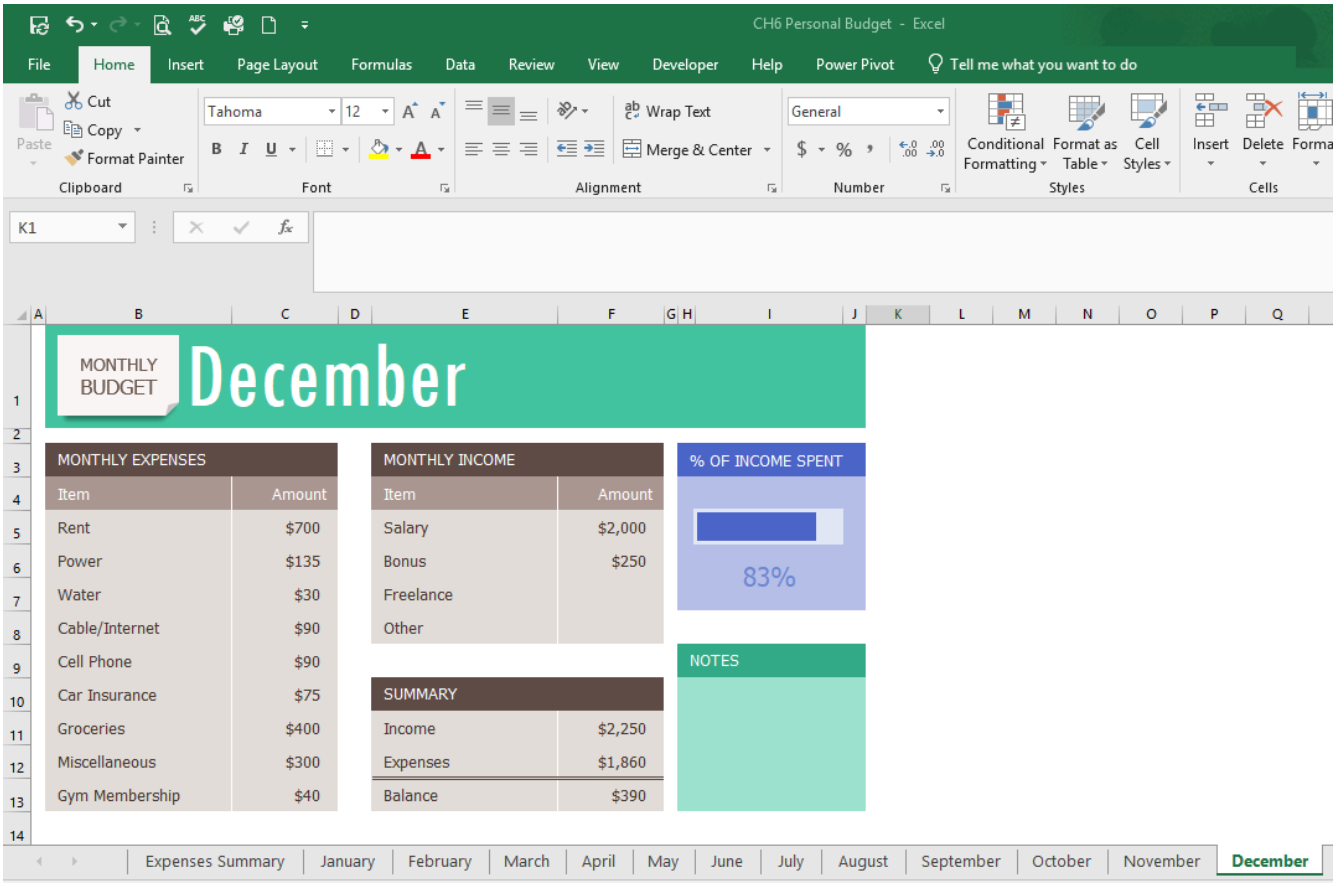


Figure 6.6 December Sheet with Formulas

1. Take a look at the Notes in the September sheet. It says that the rent was raised in September, so we need to cancel our Gym Membership and show $0 for the Gym amount in October, November, and December.
2. Group the **October, November, and December** sheets. If you do this successfully, these three sheet names should be bold and the word [Group] or – Group will appear in the Title bar.
3. Click on C13 and change the amount to **$0**. Press Enter.
4. Ungroup the sheets. The balances should be: October $605, November $530, and December $430.

Skill Refresher

To Group Sheets:
Click on the leftmost sheet you want to group; then hold the SHIFT key down and click on the rightmost sheet you want to group. Same for Excel for Mac.

To Ungroup Sheets:
Right-click on one of the grouped sheets and choose Ungroup Sheets.

Mac Users hold down **Ctrl** key click on one of the grouped sheets and choose **Ungroup Sheets.**

Key Takeaways

- You can easily move, copy, delete, and rename sheets in your Excel file.
- Grouping sheets allows you to change a group of identically formatted sheets at the same time.

ATTRIBUTION

6.2 Formulas with 3-D References

Learning Objectives

- Entering formulas that reference another sheet.
- Using the SUM function to add up multiple sheets.

The Summary sheet in many multiple sheet workbooks is utilized to present totaled information from the other sheets in the file. This is done to give a quick synopsis of all the other sheets in one convenient location. For this reason, the Summary sheet is usually the first sheet in multiple sheet files. Summary sheets "pull" data from the other sheets using three-dimensional (3-D) cell references. In order to distinguish between A3 in the Summary sheet, A3 in the January sheet, A3 in the February sheet, etc.; a 3-D cell reference includes the sheet name along with the cell reference. The syntax to reference a cell in a different sheet is =SheetName!CellRange. So, the cell reference for A15 in the March sheet would be =March!A15.

Let's start working on our summary sheet by trying out some 3-D formulas:

1. Click on the **Expenses Summary** sheet **tab** at the bottom of the screen.
2. Click on C5 and enter the formula **=January!C5**. Press Enter.
   This will return the amount $700 from cell C5 in the **January** sheet.
3. Delete the formula in C5 in the **Expenses Summary** sheet.
4. This time, click on C5 and type **=**. Then click on the **January** sheet, and then click on C5.
5. Press Enter. This will put the same formula, =January!C5, in cell C5 in the **Expenses Summary** sheet and will return the value $700. This is the **point and click method.** This method reduces the potential for making errors, such as misspellings or typing the wrong amount.
6. In cell C6 in the **Expenses Summary** sheet**,** try entering a formula for the Power amount in the **April** sheet. You should get $135 as the Power amount, and the formula should be =April!C6.
7. Delete the formulas in cells C5 and C6 in the **Expenses Summary** sheet.

For the Annual Amounts in C5:C13 in the **Expenses Summary** sheet, we don't need the amount

from a single month's sheets; instead, we need the sum of all the entries in all the monthly sheets. So, we need to sum three-dimensionally through all twelve month sheets.
Let's try adding up all the monthly amounts in our Expenses Summary sheet:

1. Click in C5 in the **Expenses Summary** sheet.
2. Type **=SUM(**. (Make sure to type the open parentheses!)
3. Click on the **January** sheet.
4. Hold the SHIFT key down and click on the **December** sheet.
5. Click on C5 again and press ENTER. Cell C5 should display the sum amount of $8,400.
6. Click on C5 in the **Expenses Summary** sheet. In the formula bar, you should see the following formula: =SUM(January:December!C5). This formula tells Excel to SUM cell C5 in the sheets January through December.
7. Let's try another 3-D SUM together. Click on C6.
8. Type **=SUM(**. (Make sure to type the open parentheses!)
9. Click on the **January** sheet.
10. Hold the SHIFT key down and click on the **December** sheet.
11. Click on C6 again and press ENTER. Cell C6 should now display the sum amount of $1,610.
12. Click on C6 in the **Expenses Summary** sheet. In the formula bar, you should see the following formula: =SUM(January:December!C6).

If you feel comfortable with these 3-D formulas, you can copy C6 down through C13 to fill in the rest of the formulas. If you're not quite comfortable yet, keep practicing the above steps to add 3-D formulas to cells C7:C13. When you're done, your Expenses Summary sheet should match **Figure 6.7**.

ANNUAL EXPENSES (TO DATE)	
Item	Amount
Rent	$8,400
Power	$1,610
Water	$360
Cable / Internet	$1,080
Cell Phone	$1,080
Car Insurance	$900
Groceries	$4,175
Miscellaneous	$2,535
Gym Membership	$360

Figure 6.7 Complete Expenses Summary Formulas

While our 3-D formulas are complete in the Expenses Summary sheet, our summary feels like it is lacking something. Let's add a visual representation of our summary numbers to the sheet.

1. Highlight cells B5:C13 in the **Expenses Summary sheet**.
2. Click on Pie Chart in the Insert tab in the ribbon and select the 2-D pie.
3. Move and resize the pie chart so that it fills cells D3:J15.
4. Delete the chart title.
5. Move the legend to the right side of the chart. Resize the legend as needed.
6. Add percentage data labels to the pie slices. Format the data labels to be bold with white font color. Your complete Expenses Summary sheet should look like **Figure 6.8** below.
7. Check the spelling on all of the worksheets and make any necessary changes.
8. Save your file. If you're printing your assignment at this point, print ONLY the Summary sheet in regular and formula view. Close your file.

MONTHLY BUDGET

Expense Summary

ANNUAL EXPENSES (TO DATE)	
Item	Amount
Rent	$8,400
Power	$1,610
Water	$360
Cable / Internet	$1,080
Cell Phone	$1,080
Car Insurance	$900
Groceries	$4,175
Miscellaneous	$2,535
Gym Membership	$360

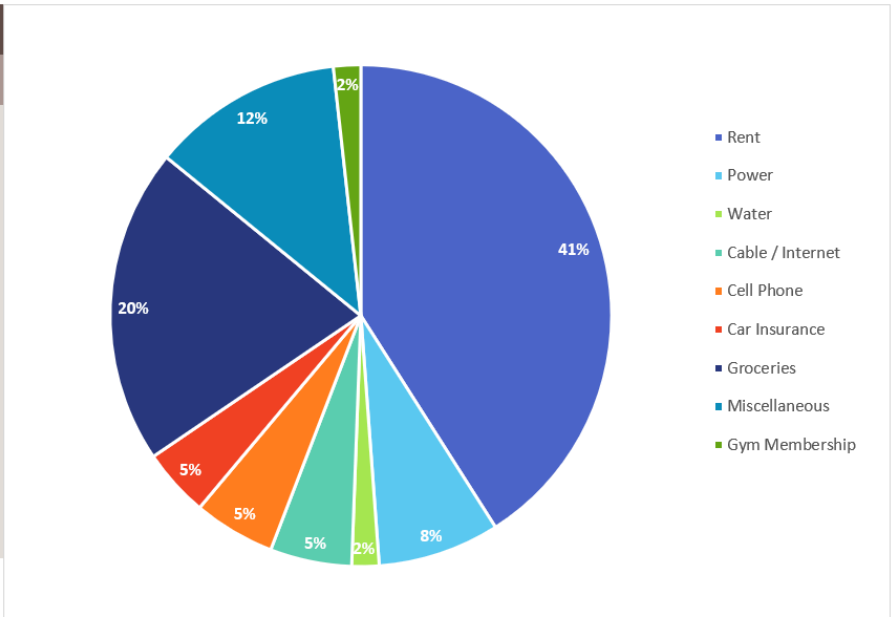


Figure 6.8 Completed Expenses Summary Sheet

Skill Refresher

To SUM across sheets:

1. Click on the cell where you want the 3-D SUM to appear.
2. Type **=SUM(**
3. Click on the leftmost sheet in the group of sheets you want to sum.
4. Hold the SHIFT key down and click on the rightmost sheet in the group of sheets you want to sum.
5. Click on the cell in the sheet you're in that you want to sum.
6. Press ENTER.

Skill Refresher

3-D References in Formulas

To reference a cell in another sheet, use the formula syntax =SheetName!CellAddress.

To enter a 3-D reference:

1. Click on the cell where you want the formula to appear and type =.
2. Click on the sheet with the cell you want.
3. Click on the cell in the sheet you want and press ENTER.

Key Takeaways

- 3-D references in formulas allow you to use data from one or more sheets on another sheet.

ATTRIBUTION

6.3 Templates

Learning Objectives

1. Use existing Microsoft Excel templates to create new spreadsheets.

A template is a predefined pattern for a spreadsheet that has already been created for you. Hundreds of templates, already created by Microsoft, are available for you to use in Excel. These templates are very helpful if you have limited time to get a new task done in Excel, and you don't know where to start. Templates do a lot of the work for you! Templates include all the formulas, formatting, etc. needed in a professional Excel spreadsheet. All that's left to do is enter the data. Predefined Microsoft templates include everything from billing statements to blood pressure trackers to business cards. Depending on your version of Excel or Office 365, template categories may include: Business, Personal, Planners and Trackers, Lists, Budgets, Charts, and Calendars. In this chapter we will explore using existing Microsoft templates.

To access the templates in Excel, do the following:

1. Click the **File tab** in the ribbon.
2. Click **New** in Backstage View. **Mac Users:** Click the **File** menu option and choose **New from Template**
3. The top of your screen should look similar to **Figure 6.9.** If you have opened templates previously, these may show in this screen as well.

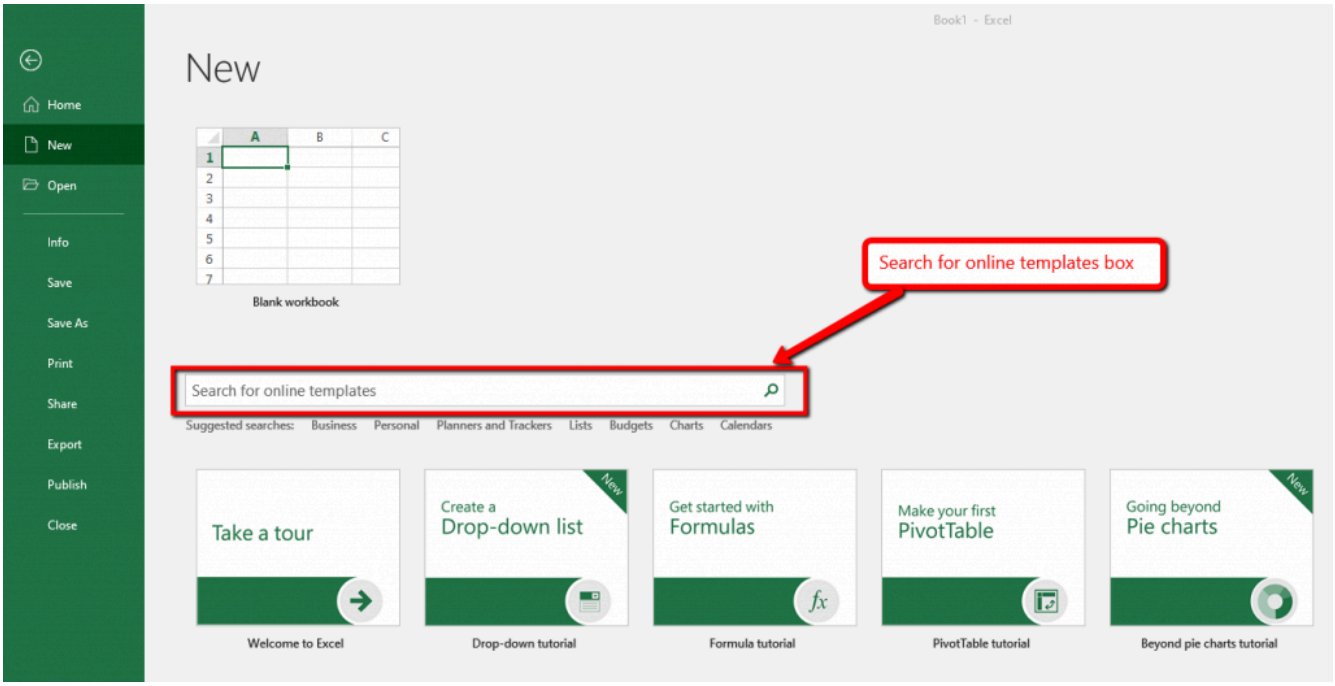
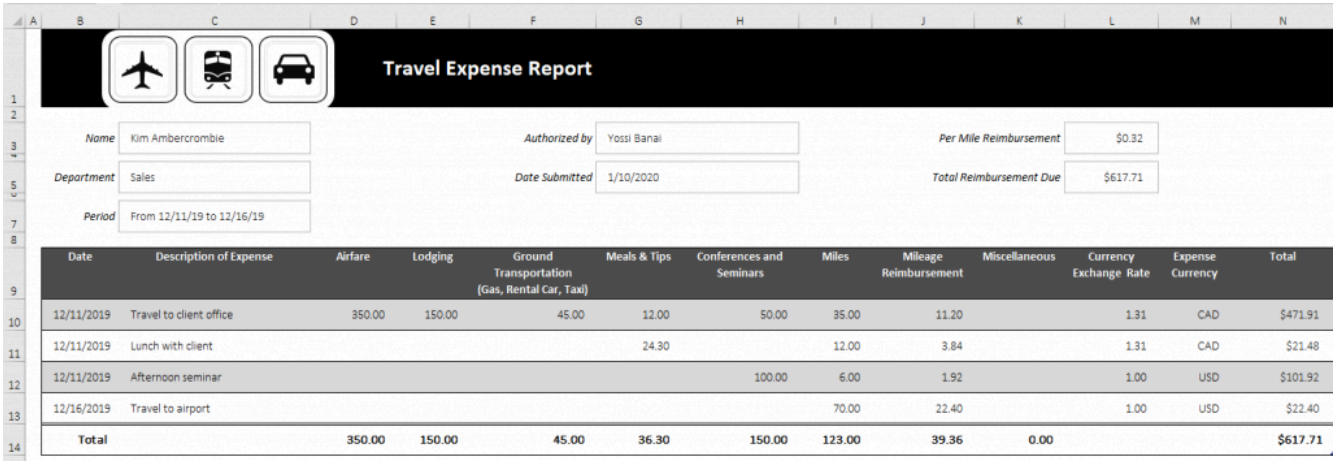


Figure 6.9 New Template Screen in Backstage View

In the **Search for online templates** box shown above, you can type a description for the template you want to use. Let's start by searching for a Travel Expense Report.

1. Click in the Search for online templates box.
2. Type **Travel Expense** and press ENTER.
3. Click on the **Travel Expense Report** that looks like Figure 6.10 below and click Create.
   NOTE: If this template is not available, select a similar one.

Your screen should look similar to **Figure 6.10** below. Notice the design, layout, and formulas have already been set up for you.



Travel Expense Report

Name	Kim Ambercrombie	Authorized by	Yossi Banai	Per Mile Reimbursement	$0.32
Department	Sales	Date Submitted	1/10/2020	Total Reimbursement Due	$617.71
Period	From 12/11/19 to 12/16/19				

Date	Description of Expense	Airfare	Lodging	Ground Transportation (Gas, Rental Car, Taxi)	Meals & Tips	Conferences and Seminars	Miles	Mileage Reimbursement	Miscellaneous	Currency Exchange Rate	Expense Currency	Total
12/11/2019	Travel to client office	350.00	150.00	45.00	12.00	50.00	35.00	11.20		1.31	CAD	$471.91
12/11/2019	Lunch with client				24.30		12.00	3.84		1.31	CAD	$21.48
12/11/2019	Afternoon seminar					100.00	6.00	1.92		1.00	USD	$101.92
12/16/2019	Travel to airport						70.00	22.40		1.00	USD	$22.40
Total		350.00	150.00	45.00	36.30	150.00	123.00	39.36	0.00			$617.71

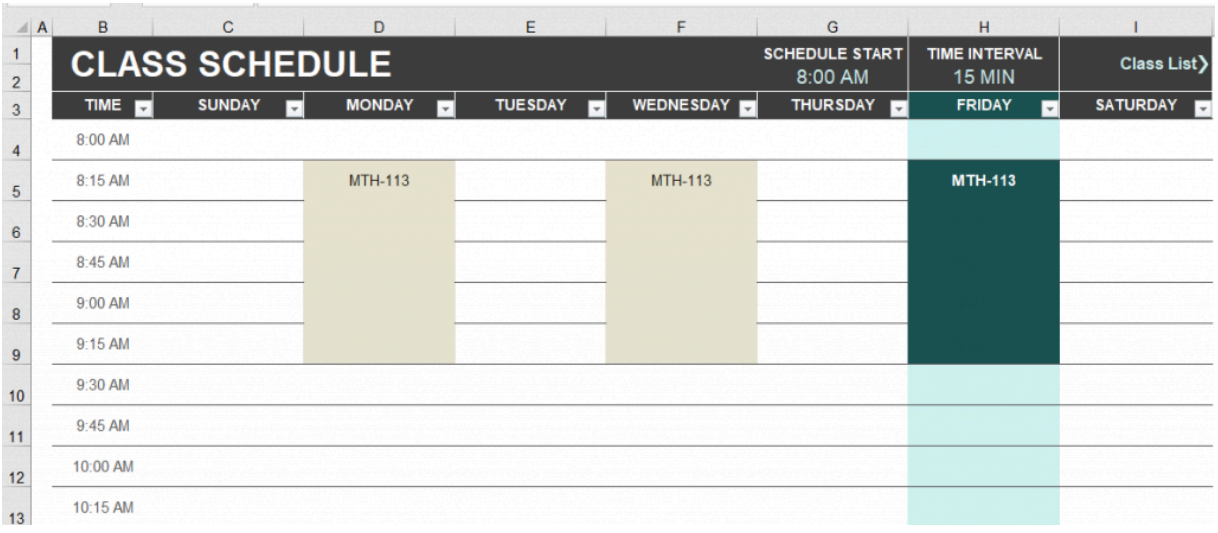
Figure 6.10 Travel Expenses Report Template

Try using this template by doing the following:

1. Change the Name to **your name**.
2. Change the Department to **Technology**.
3. Hold down CTRL and click **~** to see where the formulas are in the sheet. Working in formula view helps you see where the formulas are, so you won't delete them.
4. In formula view, carefully delete just the data, including the Description of Expense and the dollar amounts. Don't delete any formulas!
5. Hold down CTRL and click ~ again to return to Normal view.
6. Enter Dates, Descriptions and expenses for a trip of your imagining in the first three rows under the column headings.
7. Save the completed file as **CH6 Travel Expenses**. Close the file.

We will practice using one more Excel template to create a class schedule. If you already know your schedule for next term, you can use it to complete this template. Otherwise, use your current class schedule.

1. Click the **File tab** in the ribbon.
2. Click **New** in Backstage View. **Mac Users:** Click the **File** menu option and choose **New from Template**
3. Click in the Search for online templates box.
4. Type **Class Schedule** and press Enter.
5. Click on the **Student schedule** that looks like Figure 6.11 below and click Create. NOTE: If this template is not available, select a similar one.



	A	B	C	D	E	F	G	H	I
1		CLASS SCHEDULE					SCHEDULE START 8:00 AM	TIME INTERVAL 15 MIN	Class List
2									
3		TIME	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
4		8:00 AM							
5		8:15 AM		MTH-113		MTH-113		MTH-113	
6		8:30 AM							
7		8:45 AM							
8		9:00 AM							
9		9:15 AM							
10		9:30 AM							
11		9:45 AM							
12		10:00 AM							
13		10:15 AM							

Figure 6.11 Class Schedule Template

6. Click on the **Class List** sheet. Replace the information in the Class, ID, Day, Location, Start Time and End Time columns with your own class schedule. In the Day column, use the dropdown arrow in the lower right corner of the cell to select the day of the week.

7. Click back on the **Class Schedule** sheet to view your completed schedule. Click in cell H2, then click the dropdown arrow in the lower right corner and select **60 MIN** for the Time Interval.
8. Save the completed file as **CH6 Class Schedule**. Close the file.

Skills Refresher

To use a Microsoft predefined template:

1. Click on the File tab in the ribbon.
2. Click on New

   Mac Users: Click the **File** option and choose **New from Template**
3. Type the desired template description in the Search box, and press ENTER.

Key Takeaway

- There are many pre-designed templates in Excel developed in Excel that you can use. This will save you the time and effort of designing and creating these files from scratch.

ATTRIBUTION

6.4 Preparing to Print

Learning Objectives

1. Printing all of the worksheets in a workbook at one time.
2. Preparing multiple worksheets for printing using grouping.

Just like consistency in formatting is important when working with workbooks containing multiple worksheets with the same type of data, so is consistency in page setup. Now that the CH6 Personal Budget workbook is complete, you are going to prepare it for printing by changing the page orientation and adding a header. You will also print all 13 worksheets at one time.

APPLYING PAGE SETUP OPTIONS TO GROUPED WORKSHEETS

Data file: ***Continue with CH6 Personal Budget.***

As always, you need to review your workbook in Print Preview before considering it complete. When you do that with this workbook, you notice that the worksheets are each printing on two pages. You decide to switch all the worksheets to Landscape orientation to see if that helps. You will also add a footer with the worksheet name to each of the worksheets.

1. Go to Print Preview. To view all of the worksheets at one time, select Print Entire Workbook in the first box in the Settings section. You should now have 26 pages to scroll through in Print Preview. If you were to click the Print button, all of the worksheets would print, not just the active sheet.
2. Exit Backstage View. You want to change the page orientation of all the sheets, but you cannot change all of them at one time in Print Preview.
3. Group all of the worksheets together, including the **Expenses Summary sheet through the December sheet.**
4. Click on the Page Layout tab on the ribbon, then select Landscape using the Orientation button in the Page Setup group.
5. Click the Page Setup dialog box launcher arrow in the Page Setup group then click the

Header/Footer tab.

Mac Users: Click the **Page Setup** button (there are no "dialog box launcher arrows) in Excel for Mac

6. Click the Custom Footer button. In the center section, insert the sheet name using the Insert Sheet Name button. The Footer dialog box should look like **Figure 6.12**.

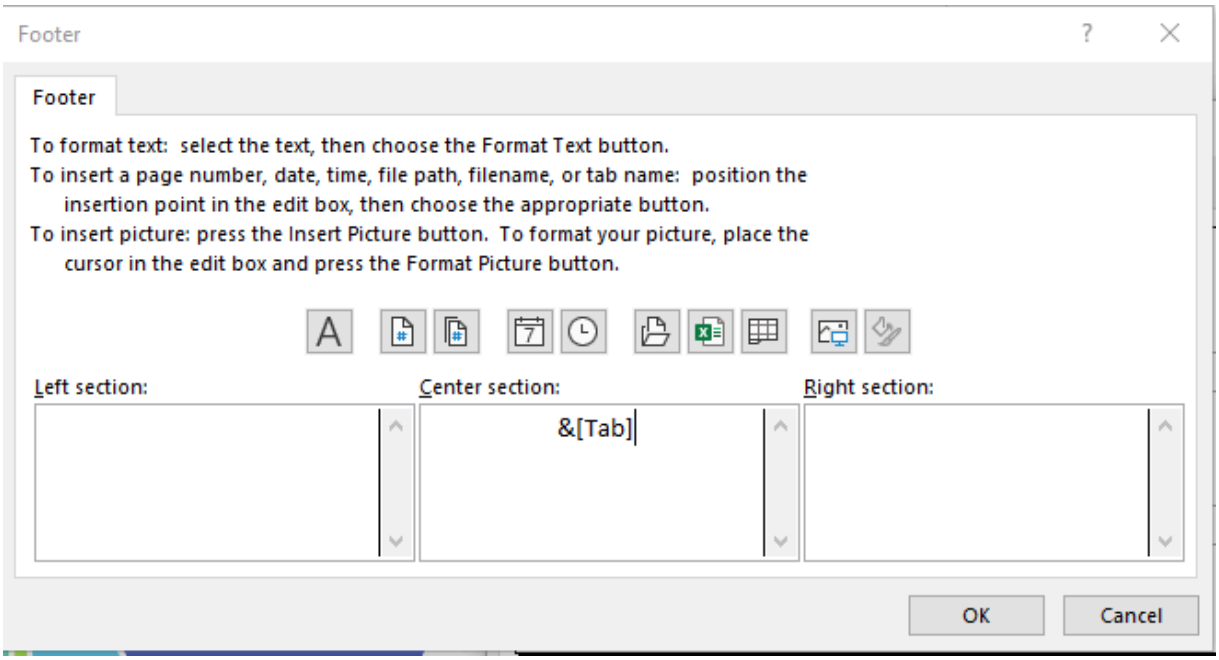


Figure 6.12 Insert Worksheet Name

7. Click OK to close the Footer dialog box. Click OK again to close the Page Setup dialog box.
8. Return to Print Preview to confirm that each worksheet is printing on one page, in landscape orientation, with the correct worksheet name appearing in the footer.

   Mac Users: the monthly sheets may still show as printing on multiple pages. If that is the case, close Print Preview, make sure all of the sheets are still grouped, click the **Page Layout tab**, click the **Page Setup** button, and click the **Fit to** scaling option. It should show "1 pgs wide by 1 tall". Then click **OK.**

In Print Preview you notice that the **Expenses Summary** sheet is not set to print correctly. Part of the chart is appearing on a second page. You can easily fix this by changing the Scaling, but you only want to change the scaling of the **Expenses Summary** sheet, not the entire workbook. If you make the change in Print Preview while the worksheets are grouped it will change all of the worksheets.

Mac Users can skip steps 1-7 below. You should see in Print Preview that all sheets are now displaying on one page including the Expenses Summary sheet. Continue with **Step 8 below.**

1. Exit Backstage View.
2. Ungroup the worksheets by right-clicking on any of the worksheet tabs and selecting Ungroup Sheets.
3. If needed, click on the **Expenses Summary** worksheet tab to make it the active worksheet.
4. Click on the Page Layout tab on the ribbon and locate the Scale to Fit group of commands. (See **Figure 6.13**.)

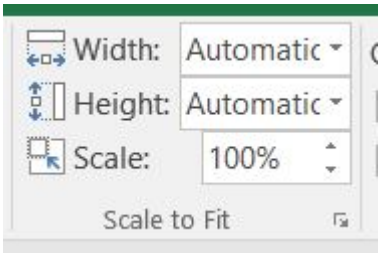


Figure 6.13 Scale to Fit

5. Click the drop-down arrow for Width: and select 1 page. This has the same result as selecting Fit All Columns on One Page in the Scaling setting in Print Preview.
6. Return to Print Preview to confirm that the **Expenses Summary** worksheet is now printing on one page only.
7. Exit Backstage View.
8. Save the **CH6 Personal Budget** workbook.
9. Submit the following files as directed by your instructor.

- **CH6 Personal Budget**
- **CH6 Travel Expenses**
- **CH6 Class Schedule**

Key Takeaways

- To print all of the worksheets in a workbook at one time select Print Entire Workbook in the Print Settings.
- You can apply page setup options, such as scaling, orientation, and headers/footers, to multiple worksheets at one time by grouping the worksheets.

ATTRIBUTION

6.5 Chapter Practice

CREATING A MULTIPLE SHEET WORKBOOK FOR A SPORTS TEAM

Data file: PR6 Data

You have just been hired by Pacific Northwest Soccer Club, and you quickly realize that there isn't a consistent way for all the coaches to keep track of their team statistics. To help with this, you decide to create a multiple sheet workbook for Season Stats for each team. Since you are also the coach of the High Flyers Team this season, you will need to use the workbook to enter your team's statistics.

1. Open the data file **PR6 Data** and save the file to your computer as **PR6 Pacific NW Sports Team**.
2. Copy the range B11:G22 in the **Season Stats** sheet to the same range in the **Player Stats** sheet.
3. You will add formulas to this worksheet before entering the data later in the assignment. Group the sheets and add the following formulas to both sheets:
4. In C22 and D22, you will need to count the Xs (that you will enter later) in rows 12 through 21. To do this, use the COUNTA function. If necessary, review the COUNTA function in Chapter 2. Your formulas will return zeros for now, until you enter the data.
5. In E22 and F22, sum rows 12 through 21.
6. In G12, calculate the Goal Percentage by dividing the number of Goals by the number of Shots. This formula will display an error message because there is no data in column E (Excel shows the #DIV/0! error when a number is divided by zero). We don't want to display error messages, so an IF statement that tests the value of column E will solve this problem.
7. Change the formula in G12 to an IF Function with the following three arguments:
    - Test – is E12 greater than zero
    - If the Test is True – divide the number of Goals by the number of Shots
    - If the Test is False – enter a zero
8. Copy G12 down the column through G22. Format these cells as percentages.

9. Ungroup the sheets.
10. Save the file.
11. In the **Season Stats sheet**, enter the following data:
    - D3 – High Flyers
    - D4 – Fall and the current year (i.e. – Fall 2020)
    - D5 – Pacific Northwest Soccer
12. Enter your name, phone number, and email address in row 8.
13. Make two copies of the **Player Stats** worksheet. Rename the Player Stats worksheets **Player 1, Player 2 and Player 3**.
14. Group the **Player** sheets only. Enter the following formulas:
15. A formula in D4 that points (links) to cell D3 in the **Season Stats** sheet. Your formula should be ='Season Stats'!D3.
16. A formula in D5 that points to cell D4 in the **Season Stats** sheet.
17. A formula in D6 that points to cell D5 in the **Season Stats** sheet.
18. Ungroup the sheets.
19. Click on the **Player 1** sheet. Enter the Player Name: **Juan Ramirez**. Enter the following data from **Table 1** below:
    Table 1: Player 1 Sheet

	Played	Started	Shots	Goals
Game 1	x	x	2	1
Game 2	x	x	3	1
Game 3				
Game 4	x			
Game 5	x	x	2	0
Game 6	x			
Game 7				
Game 8	x	x	1	1
Game 9	x	x	4	2
Game 10	x	x	3	3

20. Click on the **Player 2 shee**t. Enter the Player Name: **Zach Johnson**. Enter the following data from **Table 2** below:
    Table 2: Player 2 Sheet

	Played	Started	Shots	Goals
Game 1	x	x	1	1
Game 2	x	x	2	1
Game 3	x	x	1	1
Game 4	x	x	1	1
Game 5	x	x	2	0
Game 6	x	x	5	2
Game 7	x	x	4	2
Game 8	x	x	1	1
Game 9	x	x	4	1
Game 10	x	x	3	2

21. Click on the **Player 3 sheet**. Enter the Player Name: **Vito Lawrenz**. Enter the following data from **Table 3** below:
Table 3: Player 3 Sheet

	Played	Started	Shots	Goals
Game 1	x	x	0	0
Game 2	x	x	1	1
Game 3	x	x	2	0
Game 4	x		1	1
Game 5	x	x	2	0
Game 6	x	x	3	1
Game 7	x	x	2	1
Game 8	x	x	1	1
Game 9	x	x	1	1
Game 10	x	x	1	1

22. Go to the **Season Stats** sheet and click on cell C12. Enter a 3-D formula to COUNTA (count the x's) in C12 for the **Player 1 through Player 3** sheets. Copy the formula in C12 through D21.
23. Change the formulas in C22 and D22 from COUNTA to SUM.
24. Click on E12. Enter a 3-D formula to SUM cell E12 in the **Player 1 through Player 3** sheets. Copy the formulas through F21.
25. Preview the worksheets in Print Preview. Notice that only part of the data is printing for each worksheet. This is because a Print Area was incorrectly set when the file was first created. You need to clear this Print Area for **each worksheet** individually (modifying print areas cannot be done on grouped sheets). Exit Backstage View and for each worksheet, click the **Print Area** button on the Page Layout tab and select **Clear Print Area**.
26. Group the sheets and add a Custom Footer that shows the Sheet Name in the center of the footer.

27. Double check Print Preview to make sure each sheet is printing on one page, and that the Sheet Name shows in the center of the footer.
28. Your completed Seasons Stats sheet should look like Figure 6.14.

SEASON STATISTICS	
TEAM NAME	High Flyers
YEAR/SEASON	Fall (Current Year)
ORGANIZATION	Pacific Northwest Soccer

COACH'S NAME	PHONE NUMBER	EMAIL ADDRESS
Student's Name	(503) 555-1212	student@pcc.edu

	Played	Started	Shots	Goals	Goal Percentage
Game 1	3	3	3	2	67%
Game 2	3	3	6	3	50%
Game 3	2	2	3	1	33%
Game 4	3	1	2	2	100%
Game 5	3	3	6	0	0%
Game 6	3	2	8	3	38%
Game 7	2	2	6	3	50%
Game 8	3	3	3	3	100%
Game 9	3	3	9	4	44%
Game 10	3	3	7	6	86%
TOTAL SEASON	28	25	53	27	51%

Figure 6.14 Completed Seasons Stats Sheet

29. The formulas in row 12 of the Seasons Stats sheet should match Figure 6.15.

	Played	Started	Shots	Goals	Goal Percentage
Game 1	=COUNTA('Player 1:Player 3'!C12)	=COUNTA('Player 1:Player 3'!D12)	=SUM('Player 1:Player 3'!E12)	=SUM('Player 1:Player 3'!F12)	=IF(E12>0,F12/E12,0)

Figure 6.15 Season Stats Sheet Formulas in Row 12

30. Check the spelling on all of the worksheets and make any necessary changes.
31. Save the **PR6 Pacific NW Sports Team** workbook and submit as directed by your instructor.

ATTRIBUTION

6.6 Scored Assessment

A MULTIPLE SHEET WORKBOOK FOR NATIONAL PARKS DATA

Data file: none

You are working at the Headquarters of the National Parks Department. One of your jobs this week is to develop a workbook for individual park visitor data, along with a Summary sheet of four of the parks visitation data. To do this, you will need to design and create a workbook with summary and individual park worsheets, and then enter park data for four national parks: Blue Ridge Parkway, Crater Lake, Yellowstone, and Yosemite.

When designing your worksheets, be intentional about your formatting choices. Think about font sizes, fill colors, bold and number formatting to make your worksheet aesthetically pleasing. Make sure that all of your worksheets are formatted consistently. In addition, search for and insert a relevant park image into every worksheet. You will enter the visitor data later in the assignment after you have created the individual park and summary worksheets.

1. Open a blank Excel workbook. Save the file as **SC6 National Parks**.
2. Design a professionally formatted worksheet that will be used to display the individual park visitor data (this worksheet will be copied in later steps). Include an area to enter the name of the individual park and the park visitor categories listed in **Table 4.** Name the worksheet **Park Data.**
3. Create four copies of the Park Data worksheet, one for each of the national parks listed in Table 4. Be sure to rename each worksheet!
4. Enter the data from Table 4 below into the correct park worksheet. Insert a picture of the park and place it appropriately on the worksheet.

Table 4: 2018 National Park Visitors

	Blue Ridge Pkwy	Crater Lake NP	Yellowstone NP	Yosemite NP
Recreation Visits	14,862,422	696,337	4,104,444	3,896,657
Non-recreation Visits	1,942,260	49,600	1,223,591	144,420
Concessioner Lodging Overnights	46,001	34,614	663,150	660,362
Concessioner Camping Overnights	0	42,039	616,194	0
Tent Overnights	59,056	6,814	88,304	378,201
Recreation Vehicle Overnights	34,158	0	73,872	270,740
Backcountry Overnights	787	2,641	42,215	124,725
Misc. Overnights	1,294	0	11,834	18,345

1. Rename the **Park Data** worksheet to **Summary Park Data**. Change the Park Name text so that it is appropriate for the Summary sheet.
2. In the **Summary Park Data** sheet, create 3D formulas for each category that add up the visitors in the four park sheets.
3. Insert a picture that represents National Parks.
4. Group the worksheets and add a Custom Footer that shows the Sheet Name in the center of the footer.
5. Preview the entire workbook in Print Preview to ensure that it is printing professionally. Make any changes needed.
6. Check the spelling on all of the worksheets and make any necessary changes. Save the **SC6 National Parks** workbook.
7. Submit the **SC6 National Parks** file as directed by your instructor.

National Park 2018 Fiscal Year Visitation Report Data from: https://irma.nps.gov/Stats/SSRSReports

ATTRIBUTION

This is where you can add appendices or other back matter.