Microsoft Excel: Intermediate

Office 365 Training

The **Proven** group
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Microsoft® Excel®: Intermediate

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Microsoft® Excel®: Intermediate

Contents

ABOUT THIS COURSE

Course Prerequisites

This manual assumes the user has completed or understands the materials covered in the first part of the Microsoft Office Excel 365: Basic courseware, including:

- Using absolute, relative, and mixed references

- Using formulas and functions in a worksheet

- Managing and organizing worksheets

- Editing and formatting Excel data

- Printing and saving Excel files

- Customizing the Excel interface

Course Overview

This version of Excel incorporates some new features and connectivity options in an effort to make collaboration and production as easy as possible.

This course is intended to help all users get up to speed on the different features of Excel and to become familiar with its more advanced selection of features. We will cover how to create and use advanced formulas, analyze data, organize worksheet data with tables, visualize data with charts, insert graphics, and enhance workbooks.

Course Objectives

By the end of this course users should be comfortable in analyzing data with functions, working with tables, visualizing data with charts, and enhancing workbooks.

How to Use This Book

This course is divided into lessons. Each lesson focuses on several key topics, each of which are broken down into easy-to-follow concepts. At the end of each topic, you will be given an activity to complete. At the end of each lesson, we will summarize what has been covered and provide a few review questions for you to answer.

LESSON 1:
ANALYZING DATA WITH LOGICAL AND LOOKUP FUNCTIONS

Lesson Objectives

In this lesson you will learn how to:

- Use text functions

- Use logical functions

- Use lookup functions

- Use date functions

- Use financial functions

TOPIC A: Use Text Functions

Although you are familiar with Excel's more commonly used functions, here we will learn about some of its more specialized ones. In this topic you will learn about functions that are specific to text analysis.

Topic Objectives

In this session, you will learn:

- About text functions

- About LEFT and RIGHT functions

- About the MID function

- About the LEN function

- About the TRIM function

- About the UPPER, LOWER, and PROPER functions

- About the CONCATENATE function

- About the TRANSPOSE function

Text Functions

Text functions are used in Excel to analyze text-based worksheet data. While such functions can be used for data analysis, they are typically used instead to prepare data for analysis. This is because they allow you to format textual data for use in other areas. For example, you can use text functions to import textual data from another workbook and format it so that it meets the formatting requirements for the destination workbook.

The LEFT and RIGHT Functions

=LEFT(text, [num_chars])

=RIGHT(text, [num_chars])

The LEFT and RIGHT functions are used to return a specific number of characters from either the left or the right side of a text string. Typically, these functions are used in situations where you need to transfer text to a destination where there is a limit on the number of characters each entry may have. The **text** argument is used to declare which text you would like to transfer, while the **[num_chars]** argument is used to declare how many characters you would like transferred.

Suppose that A1 contains "John Smith" as a text string in a worksheet. Examine the possible examples of how the LEFT and RIGHT functions would work with this data:

Function	Description
=RIGHT(A1)	As the num_chars argument was not set in this function it will default to one character. This means that the output for this function would be "h" – the last letter on the far right of the text string.
=RIGHT(A1, 5)	With the num_chars argument set to 5, this function would result in "Smith" as an output – the last five letters on the far right of the text string.
=LEFT(A1, 5)	With the num_chars argument set to 5, this function would result in "John " (including the space) as an output – the first five letters on the far left of the text string.
=LEFT("John")	This function would return only "J" as an output because the num_chars argument was not set.

The MID Function

=MID(text, start_num, num_chars)

Similar in use and design to the LEFT and RIGHT functions, the MID function will return characters from the middle of a text string. As with the LEFT and RIGHT functions, the **text** argument is used to reference the cell(s) with the text string in question or to enter a text string directly into the function surrounded by double quotation marks. The **start_num** argument is unique to the MID function as it tells the function which character in the text string to start with. The **num_chars** argument then allows you to set the number of characters that you would like to return from the starting point that you set in the previous argument. Keep in mind that while the **num_chars** arguments behave the same as it does in the LEFT and RIGHT functions, it is required for the MID function to operate correctly.

Suppose that A1 contains "John Smith" as a text string in a worksheet. Examine the possible examples of how the MID function would work with this text string:

Function	Description
=MID(A1, 5, 6)	In this case, the text is contained within cell A1. The start_num argument is set to 5, so the function will start five characters (including spaces) into the text string. The num_chars argument is set to five so the five characters after the starting position will be returned. This means that "Smith" would be the output for this formula.
=MID(A1, 1, 4)	In this case, the text is contained within cell A1. The start_num function is set to one, so the function will start at the beginning of the text string. The num_chars argument is set to four so the four characters after the starting position will be returned. This means that "John" would be the output for this formula.

The LEN Function – (Length of a text string)

`=LEN(text)`

The LEN (short for length) function's sole purpose is to return the number of characters that appear within a text string. While there can be many uses for this function, it is typically used to ensure that text strings are of the correct length. For example, you could use this function to make sure that all of the text data within a row is under a specified length. The only argument in this function, **text**, is used to specify where the text data that you would like to count is stored.

Suppose that A1 contains "John Smith" as a text string and B1 contains "Jane Doe" as a text string. Examine the possible examples of how the LEN function would work with this information in mind:

Function	Description
=LEN(A1)	In this case the LEN function has the text argument set to A1. This means that a count of the text string within this cell will be returned. The output of this function would then be 10.
=LEN(B1)	In this case the LEN function has the text argument set to B1. This means that a count of the text string within this cell will be returned. The output of this function would then be 8.

The TRIM Function – (takes out spaces before & after text)

=TRIM(text)

The TRIM function is used to remove any empty spaces from text strings, excluding spaces between words. This function can be very useful in solving data compatibility issues. For example, a frequent problem in data entry is random spaces at the beginning or end of a text string. Such problems can greatly affect your ability to work with text-based data.

Note that the only argument in this function, **text**, is used to specify where the text data that you would like to work with is stored.

Suppose that A1 contains "John Smith" as a text string and B1 contains "Jane " as a text string. Examine the possible examples of how the TRIM function would work with this information in mind:

Function	Description
=TRIM(A1)	In this case the TRIM function has the text argument set to A1. "John Smith" will be returned with all of the spaces at the beginning of this text string removed.
=TRIM(B1)	In this case the TRIM function has the text argument set to B1. "Jane" will be returned with all of the spaces at the end of this text string removed.

The UPPER, LOWER, and PROPER Functions

=UPPER(text)

=LOWER(text)

=PROPER(text)

The UPPER, LOWER, and PROPER functions are used to change the case of text-based data. The UPPER function will convert all lowercase characters into uppercase, while the LOWER function will do the opposite. The PROPER function will only capitalize the first character of each word in a text string. For all these functions, the only argument is **text**. This is used to indicate the text-based data that you would like this function to work with.

Suppose that A1 contains "John Smith" as a text string and B1 contains "jANe smiTh" as a text string. Examine the possible examples of how the UPPER, LOWER, and PROPER functions would work with this information in mind:

Function	Description
=UPPER(A1)	In this example, the UPPER function will convert all of the text within cell A1 to uppercase. This means that the output would be "JOHN SMITH".
=LOWER(A1)	In this example, the LOWER function will convert all of the text within cell A1 to lowercase. This means that the output would be "john smith".
=PROPER(B1)	In this example, the PROPER function ensures that only the first character in each word in cell B1 is capitalized. This means that "Jane Smith" would be the resulting output.

The CONCATENATE Function – Joins text together

=CONCATENATE(text1, [text2], …)

The CONCATENATE function is perhaps one of the most powerful text functions available in Excel. Using this function, you can combine (concatenate) text strings together from multiple cells into a single cell. This function can save you an enormous amount of time if you need to combine data from multiple sources into one cell.

This function's only required argument is **text1**. This is where you need to declare the first string of text that you want to include in the new cell. Subsequent strings can be added using more arguments, with each separated by a comma. Keep in mind that you are limited to 254 arguments when using this function.

Suppose that you want to combine all the text data from the A1:A4 range of the example worksheet into the C1 cell:

	A	B	C
1	Jane Doe		
2	John Doe		
3	John Smith		
4	Jane Smith		

With the C1 cell selected, you would type "=CONCATENATE(A1, A2, A3, A4)" into the Formula Bar. After pressing Enter, the output of that result will display the text from all the arguments into cell C1 with no spaces in between:

Spaces (or other symbols) can be added between each text string by adding a space surrounded by double quotation marks between each argument. In this case, you would type =CONCATENATE(A1, " ", A2, " ", A3, " ", A4):
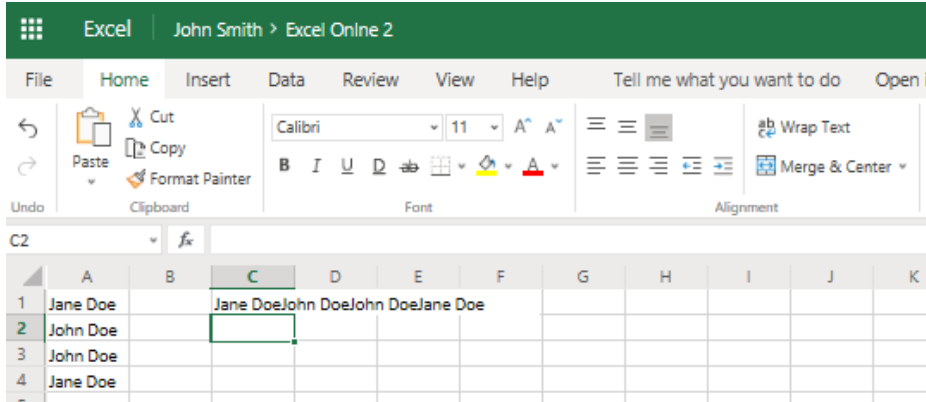

Text Concatenation with the Ampersand

While the CONCATENATE function can be extremely useful, you can also use a somewhat simpler method to join multiple text strings together. Using just the ampersand operator (&) in the Formula Bar you can achieve the same result as if you used the CONCATENATE function. For example, suppose that you wanted to combine text data from the A1 and A2 cells and display the output in cell C1:
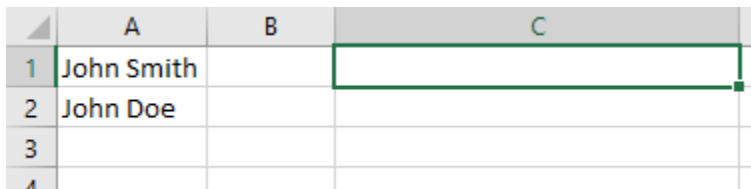
By typing "=A1&A2" into the Formula Bar, the output will result in the text strings from these two cells being combined:
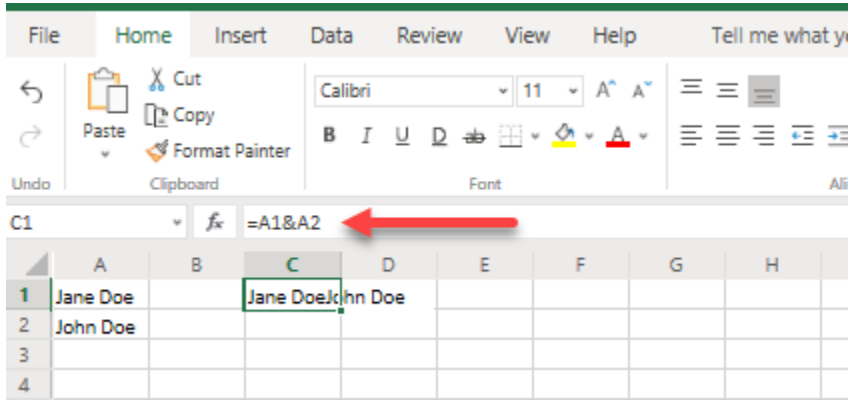
Just like with the CONCATENATE function, you can also add spaces or other characters. In this case, if you wanted to add a space between these two combined strings, you could type the following into the Formula Bar: =A1&" "&A2:
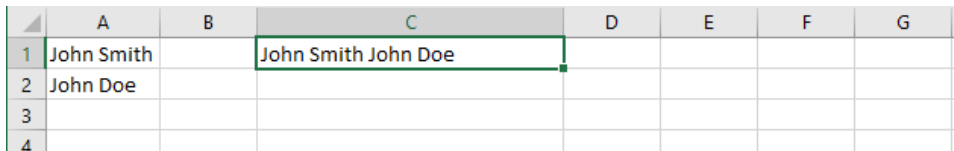

(Note that if you wanted to add a third string, you would have to add another ampersand character after the A2 cell reference.)
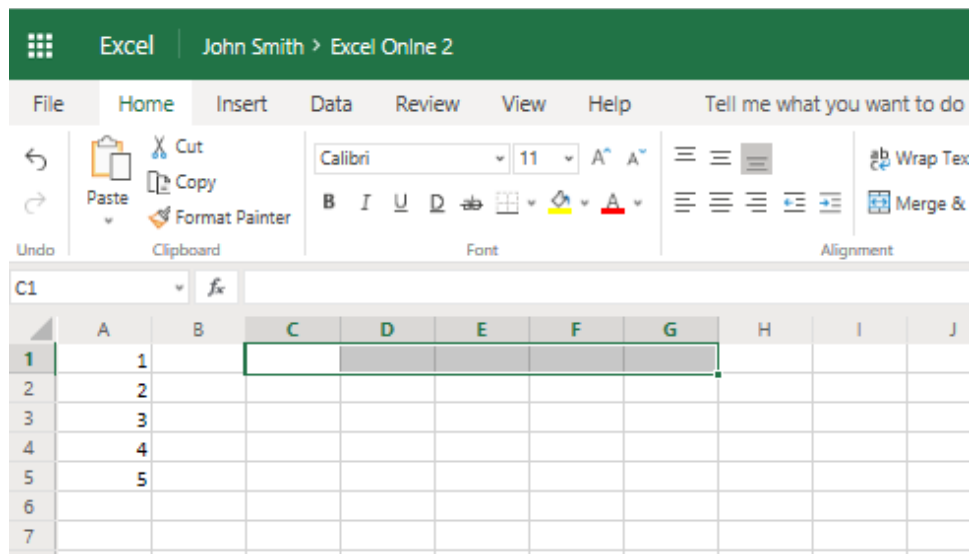
The TRANSPOSE Function

The Transpose function will shift a vertical range of cells to a horizontal range and the reverse. To operate correctly, this function needs to be entered as an array formula in a range that has the same number of rows and columns.

For example, suppose that you wanted to transpose the values in column A so that they appear horizontally in row 1:
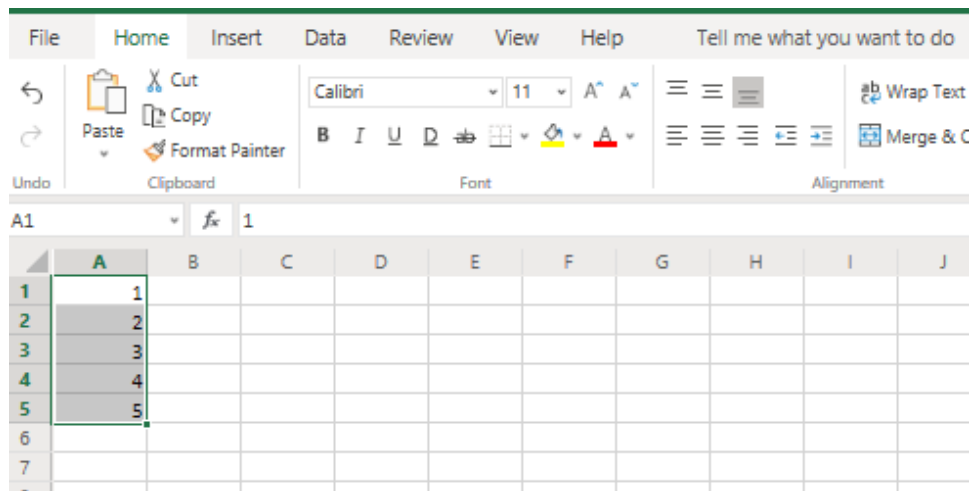
To do this, first select the destination cells that you would like the results to be shown in:

Next, you would enter the transpose function into the Formula Bar with the original cell range as the argument. In this case it would be "=TRANSPOSE(A1:A5)":

	A	B	C	D	E	F	G
1	1		(A1:A5)				
2	2						
3	3						
4	4						
5	5						
6							
7							

Press Ctrl + Shift + Enter to enter this function as an array formula and the results will be displayed within the selected cells:

|	A	B	C	D	E	F	G	H	I
1	1		1	2	3	4	5		
2	2								
3	3								
4	4								
5	5								
6									
7									

Activity 1-1: Analyzing Data Using Text Functions

Using some of the text functions that you have learned about in this topic, you would like to automate portions of an invoice form to decrease the time needed for data entry.
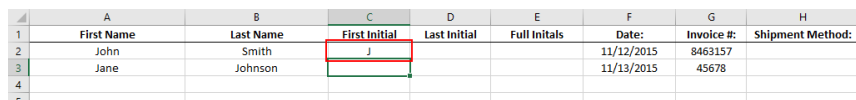
1.   To begin, open Activity 1-1 from your Exercise Files folder:
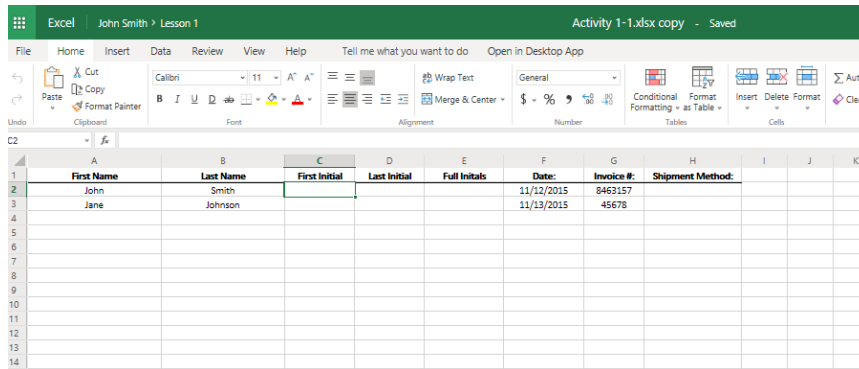
2.   First you would like to find the first initial from the first name that is entered column A. Click to select cell C2 and type "=LEFT(A2)" into the Formula Bar:
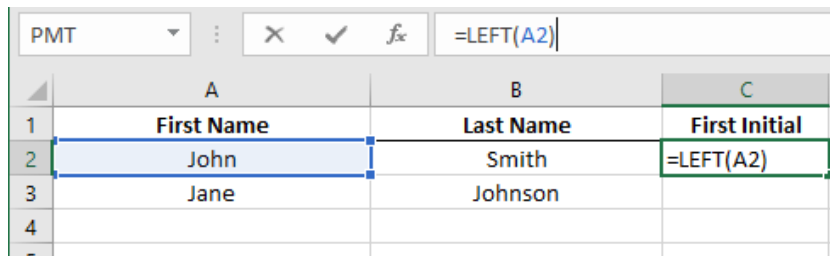
3.   Press the Enter key on your keyboard and you will see that the previously selected cell now displays the initial from the first name ("J" in this case):

4.   Next, you need to do the same thing and find the first initial from the last name that is entered column B. Click to select cell D2 and type "=LEFT(B2)" into the Formula Bar:

5.   Press the Enter key on your keyboard and you will see that the previously selected cell now displays the initial from the last name ("S" in this case):

6.   Now you need to use the CONCATENATE function to fill in the Full Initials column. Click to select the E2 cell and then type "=CONCATENATE(C2, D2)" into the Formula Bar:

7.   Press the Enter key and you will see that the values from cells C2 and D2 have been combined to show the full initials:

8. Finally, you would like to automatically fill in the shipment method based on the number of characters that appear in the invoice number. If the invoice has more than five characters, then it is a rush order, while if it is five characters or less, it is a standard order. Select H2:

	A	B	C	D	E	F	G	H
1	First Name	Last Name	First Initial	Last Initial	Full Initals	Date:	Invoice #:	Shipment Method:
2	John	Smith	J	S	JS	11/12/2015	8463157	
3	Jane	Johnson				11/13/2015	45678	
4								

9. Type "=IF(LEN(G2)>5, "RUSH", "STANDARD")" into the Formula Bar:

`=IF(LEN(G2)>5, "RUSH", "STANDARD")`

B	C	D	E	F	G	H
Last Name	First Initial	Last Initial	Full Initals	Date:	Invoice #:	Shipment Method:
Smith	J	S	JS	11/12/2015	8463157	=IF(LEN(G2)>5, "RUSH
Johnson				11/13/2015	45678	

10. Press the Enter key on your keyboard and you will see that this order is a rush order because its invoice number is more than five characters:

E		F	G	H	I
tial	Full Initals	Date:	Invoice #:	Shipment Method:	
	JS	11/12/2015	8463157	RUSH	
		11/13/2015	45678		

11. Use the Auto Fill feature to copy the formulas that you entered over the course of this activity into the adjacent cells in row 3:

	E	F	G	H	I
	Full Initals	Date:	Invoice #:	Shipment Method:	
	JS	11/12/2015	8463157	RUSH	
	JJ	11/13/2015	45678	STANDARD	

12. Save the current workbook as 'Activity 1-1 Complete' and then close Microsoft Excel.

TOPIC B: Use Logical Functions

Logical functions are used to ask yes or no questions of your data. In this session, you will learn all about the logical functions that are available in Excel 365, including the AND, OR, and IF functions.

Topic Objectives

In this session, you will learn:

- About logical functions

- About logical operators

- About the AND function

- About the OR function

- About the IF function

Logical Functions

Excel contains a collection of logical functions that allow you to essentially ask yes or no questions of your data. Such questions return a positive (TRUE) or negative (FALSE) response. Logical functions also allow you to perform calculations when certain conditions are met. For example, logical functions could be used to ask your data if the sales department met its goals for this quarter. Or, it could be used to find out if the sales department met its goal, and if so, what the bonus would be for the people in that department.

Logical Operators

Logical operators are used to compare two values against one another to see if they meet a specified logical condition. Should the values meet the logical condition (2 > 1) then the output would be the logical value of TRUE. If the values do not meet the logical condition (2 < 1), then the output would instead be FALSE. Due to this behavior, logical operators are instrumental in constructing conditions for functions and calculations to run correctly.

Below you will find a table with all of the logical operators that are available in Excel and what they do:

Operator	Symbol	Examples with TRUE Result
Equal to	=	1 = 1
Greater than	>	2 > 1
Less than	<	1 < 2
Greater than or equal to	>=	2 >= 2 3 >=2
Less than or equal to	<=	2 <= 2 1 <=2
Not equal to	<>	1 <> 2

The AND Function

=AND(logical1, [logical2], …)

This function will return a TRUE value when all of the arguments are true. On the flipside, it will return a FALSE value when all arguments in this function are false. While there can be a varied amount of use cases for this function, you would typically use it for conditional purposes. For example, you could use this function to check if all of the departments in an organization have met all of their goals for the current quarter.

The first argument that is required in this function is **logical1.** You can have up to 30 of these arguments in one AND function with each argument separated by a comma. These arguments are where you enter the logical values and operators that you would like to test for (e.g. A1>B2). Additionally, you also have the option of entering a formula as a single argument.

Suppose that A1 contains the value of 15, while cell B1 holds the value 20, and C1 contains 25. Additionally, assume that D1 holds the logical value of FALSE:

	A	B	C	D	
1	15	20	25	FALSE	
2					

Function	Description
=AND(A1<B1, B1>C1)	While the value of A1 is less than the value in B1, B1 is actually less than C1. As not all of the arguments in this function are true, the AND function will output **FALSE**.
=AND(A1<B1, B1<C1)	The value of A1 is less than B1, and similarly the value of B1 is less than C1. As all of the arguments in this AND function have returned as true, the output for this function would be **TRUE**.
=AND(D1)	The value of D1 holds the logical value of FALSE so the output of this AND function would also be **FALSE**.
=AND(2*2=4)	In this function a simple equation has been added as an argument. As this equation is correct (2X2=4) the output from this AND function would be **TRUE**.

The OR Function

=OR(logical1, [logical2], …)

The OR function is similar to the AND function with one key difference: the OR function will return a TRUE value if **any** of the arguments evaluate to TRUE. With the same 30 arguments limit as the AND function, the OR function is constructed in the same manner and supports the same items (formulas, cell references, etc.). Typically this function would be used to determine if there is a TRUE value in a group of data. For example, you could use it to quickly see if anyone in your sales department has made sales over a particular dollar amount this quarter.

Suppose that A1 contains the value of 15, while cell B1 holds the value 20, and C1 contains 25. Additionally assume that D1 holds the logical value of FALSE:

	A	B	C	D
1	15	20	25	FALSE
2				
3				

	Description
=OR(A1<B1, B1>C1)	While the value of A1 is less than the value in B1, B1 is actually less than C1. Even though only one of the arguments in this function has returned as TRUE, the OR function will still output **TRUE**.
=OR(A1<B1, B1<C1)	The value of A1 is less than B1, and similarly the value of B1 is less than C1. As all of the arguments in this OR function have returned as true, the output for this function would be **TRUE**.
=OR(D1, A1<5)	The value of D1 holds the logical value of FALSE and the data in A1 is not less than five, so both of these arguments resolve to FALSE. This means that the output for this OR function would also be **FALSE**.

The IF Function

=IF(logical_test, value_if_true, value_if_false)

The IF function is one of the most commonly used logical functions. It will set a cell value based upon if a logical test resolves to true or false. For example, you could use this function to test if a salesperson in your organization exceeded a sales goal. If that resolves to true then you could have this function output a bonus amount. If it resolves to false, then you could have this function output a zero amount.

The IF function has three arguments: **logical_test**, **value_if_true**, and **value_if_false**. The **logical_test** argument is where you create the condition that you would like to test. The **value_if_true** argument will be the output of this function if the condition is found to be true. Similarly, the **value_if_false** argument will be the output if the condition is found to be false. Keep in mind that the value arguments in this function can not only hold text and numerical data; however, all text data must be enclosed in double quotation marks.

Suppose that A1 contains the value of 15, while cell B1 holds the value 20, and C1 contains 25. Additionally, assume that D1 holds the logical value of FALSE:

	A	B	C	D
1	15	20	25	FALSE
2				
3				

Function	Description
=IF(A1<B1, "Yes", "No")	In this example, A1 is in fact less than B1 so this function would output **Yes**.
=IF(A1<B1, B1*C1, "No")	In this example, A1 is less than B1 so this function would output the result of the B1*C1 formula - **500** in this case.
=IF(A1>B1, "Yes", "No")	In this example, A1 is less than B1 so this function will result in **No** as the output.

Activity 1-2: Analyzing Data Using Logical Functions

You have been tasked with maintaining a worksheet that is used to determine if an employee qualifies for a bonus. Use the functions you learned about in this lesson to determine which employees will receive a bonus and complete the data in the ID column.

1.   To begin, open Activity 1-2 from your Exercise Files folder:
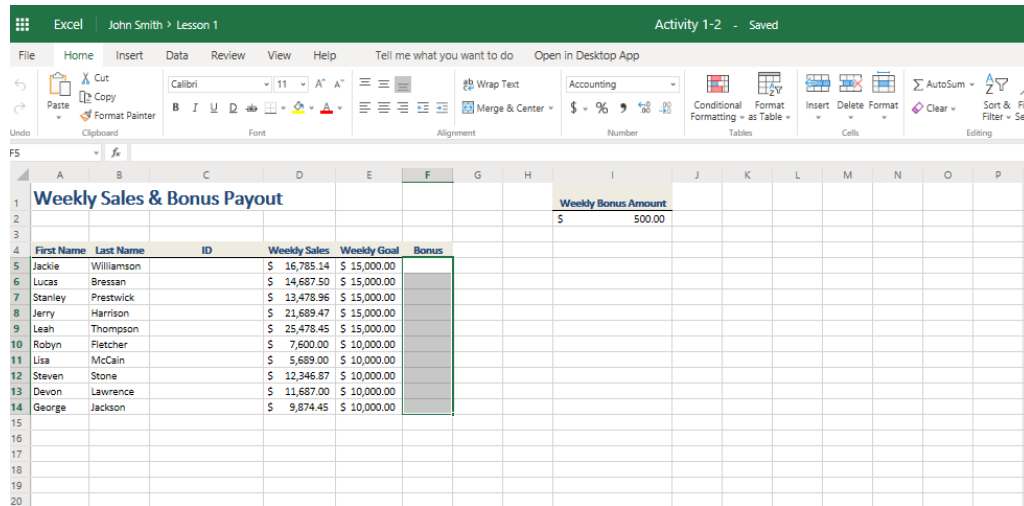
2.   First you need to fill in the ID column. This data is the first name and last name separated by an underscore (_). While you can do this manually, the CONCATENATE function is built for exactly this type of work. Use your cursor to select cells C5:C14 on the worksheet:
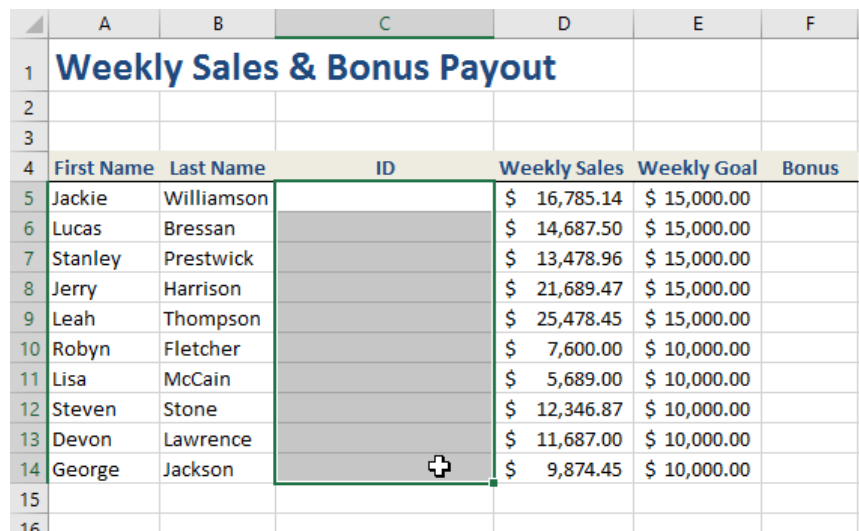
3. Next, in the Formula Bar, type "=CONCATENATE(A5:A14, "_", B5:B14)":

4. This is also an array formula so press Enter to apply it. You will now see that the formula is complete, and the contents of the ID column have been filled in correctly:

5.   Next, you need to determine which salespeople are going to receive a bonus. Bonuses are dispensed if they exceed their weekly sales goal. For this purpose, you can use the IF function. Use your cursor to select cells F5:F9 on the worksheet:

	A	B	C	D	E	F
1	**Weekly Sales & Bonus Payout**					
2						
3						
4	**First Name**	**Last Name**	**ID**	**Weekly Sales**	**Weekly Goal**	**Bonus**
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00	
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00	
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00	
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00	✛
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 10,000.00	
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 10,000.00	
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 10,000.00	
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 10,000.00	
14	George	Jackson	George _Jackson	$ 9,874.45	$ 10,000.00	
15						

6.   Inside the Formula Bar, type "=IF(D5:D9>E5:E9, I2, 0)" and then press Enter:

Hint: This is a capital "I", not a 12!

	A	B	C	D	E	F	G	H	I	J
1	**Weekly Sales & Bonus Payout**								**Weekly Bonus Amount**	
2									$ 500.00	
3										
4	**First Name**	**Last Name**	**ID**	**Weekly Sales**	**Weekly Goal**	**Bonus**				
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	=IF(D5:D9				
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00					
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00					
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00					
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00					
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 10,000.00					
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 10,000.00					
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 10,000.00					
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 10,000.00					
14	George	Jackson	George _Jackson	$ 9,874.45	$ 10,000.00					
15										

7.   The new IF function will then be applied to the selected cells as an array. You will immediately see that three of the selected employees qualify for a $500 bonus:

	A	B	C	D	E	F	G	H	I
1	**Weekly Sales & Bonus Payout**								**Weekly Bonus Amount**
2									$ 500.00
3									
4	**First Name**	**Last Name**	**ID**	**Weekly Sales**	**Weekly Goal**	**Bonus**			
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	$ 500.00			
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00	$ -			
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00	$ -			
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00	$ 500.00			
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00	$ 500.00			
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 10,000.00				
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 10,000.00				
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 10,000.00				
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 10,000.00				
14	George	Jackson	George _Jackson	$ 9,874.45	$ 10,000.00				
15									

8. Next, you need to construct a similar function that will be applied to the remainder of the salespeople on the worksheet. Use your cursor to select cells F10:F14:

	A	B	C	D	E	F
1	**Weekly Sales & Bonus Payout**					
2						
3						
4	**First Name**	**Last Name**	**ID**	**Weekly Sales**	**Weekly Goal**	**Bonus**
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	$ 500.00
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00	$ -
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00	$ -
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00	$ 500.00
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00	$ 500.00
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 10,000.00	
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 10,000.00	
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 10,000.00	
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 10,000.00	
14	George	Jackson	George _Jackson	$ 9,874.45	$ 10,000.00	
15						

9. Inside the Formula Bar, type "=IF(D10:D14>E10:E14, I2, 0)". Because this is an array function, press Enter:

Hint: This is a capital "I", not a 12!

F10 | fx | {=IF(D10:D14>E10:E14, I2, 0)}

	A	B	C	D	E	F	G
1	**Weekly Sales & Bonus Payout**						
2							
3							
4	**First Name**	**Last Name**	**ID**	**Weekly Sales**	**Weekly Goal**	**Bonus**	
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	$ 500.00	
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00	$ -	
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00	$ -	
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00	$ 500.00	
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00	$ 500.00	
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 10,000.00	$ -	
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 10,000.00	$ -	
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 10,000.00	$ 500.00	
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 10,000.00	$ 500.00	
14	George	Jackson	George _Jackson	$ 9,874.45	$ 10,000.00	$ -	
15							
16							

10. The bonus information has now been calculated for all employees in this worksheet:

	A	B	C	D	E	F
1	**Weekly Sales & Bonus Payout**					
2						
3						
4	**First Name**	**Last Name**	**ID**	**Weekly Sales**	**Weekly Goal**	**Bonus**
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	$ 500.00
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00	$ -
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00	$ -
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00	$ 500.00
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00	$ 500.00
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 10,000.00	$ -
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 10,000.00	$ -
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 10,000.00	$ 500.00
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 10,000.00	$ 500.00
14	George	Jackson	George _Jackson	$ 9,874.45	$ 10,000.00	$ -
15						

11. Save your work as 'Activity 1-2 Complete' and then close Microsoft Excel.

Hint: If you have not used an array formula but rather copied your formula down, it may not return the correct answer as excel automatically adjusts the formula that is copied to move rows as it goes.

To correct this, go into the first formula and adjust I2 to be I2 and recopy the formula. The $ holds the cell reference as static, rather than moving it with the copied formula.

TOPIC C: Use Lookup Functions

In this topic you will learn about functions that are specific to data analysis.

Topic Objectives

In this session, you will learn:

- About lookup functions

- About the LOOKUP function

- About the HLOOKUP function

- About the VLOOKUP function

- About the MATCH function

- About the INDEX function

Lookup Functions

Lookup functions are used to find and return a value by searching a corresponding row or column. For example, suppose that you are trying to find a product name that corresponds to a product number. You could use the LOOKUP function to search for the product number and then return the value from an adjacent column (Product Name in this case):

	A	B	C
1	Product #	Product Name	Unit Price
2	548946	USB Cable	4.99
3	48946	Keyboard	29.99
4	15467	Wirless Mouse	49.99
5			

The LOOKUP Function

=LOOKUP(lookup_value, lookup_area, results_area)

The LOOKUP function requires three arguments. The first is the value that you are searching for, followed by the area that you would like to search, and then the corresponding range from which you would like the results to be shown. For example, let's suppose that you want to find out the product name for product number 48946 in the following worksheet:

	A	B	C
1	Product #	Product Name	Unit Price
2	548946	USB Cable	4.99
3	48946	Keyboard	29.99
4	15467	Wirless Mouse	49.99
5			

To do this using a LOOKUP function, you would use the following formula:

PMT	▼	⋮	✕	✓	*fx*	=LOOKUP(48946, A2:A4, B2:B4)	⬅

	A	B	C	D	E	F
1	Product #	Product Name	Unit Price			=LOOKUP(
2	548946	USB Cable	4.99			
3	48946	Keyboard	29.99			
4	15467	Wirless Mouse	49.99			
5						

As you can see the value that you are looking up is entered first (48946), followed by the lookup area (A2:A4), and it is ended with the results area where the corresponding result is found (B2:B4). In this case, the result is "Keyboard:"

F1	▼	⋮	✕	✓	*fx*	=LOOKUP(48946, A2:A4, B2:B4)

	A	B	C	D	E	F	G	H
1	Product #	Product Name	Unit Price			Keyboard		
2	548946	USB Cable	4.99					
3	48946	Keyboard	29.99					
4	15467	Wireless Mouse	49.99					
5								
6								

The VLOOKUP Function – Vertical Lookup

=VLOOKUP(lookup_value, lookup_area, column, approximate_match)

The VLOOKUP (vertical lookup) function operates in a similar way to the LOOKUP function. It is used when you need to find things in a table or range only by row, and it does this by only looking for a value that appears in the left-most column of a table and then returns the corresponding value from any other column that you specify.

For example, let's suppose that you want to find unit price for "Keyboard" product. To do this, you would enter the following formula:

As you can see the value that you are looking up is entered first ("Keyboard"), followed by the lookup area (A2:C4) that includes the whole range (or table). Following this is the column index number. Columns in the selected range or table are numbered from left to right, with the first column being 1, the next 2, and so on. In this example, as we are looking for the unit price, we entered 3 for the third column. Finally, you can then choose between looking for approximate matches or exact. In this example FALSE was chosen as we wanted a direct match.

The result is 29.99 being returned by the formula:

The HLOOKUP Function – Horizontal Lookup

=HLOOKUP(lookup_value, lookup_area, row, approximate_match)

The HLOOKUP function is very similar to the VLOOKUP function, but it works horizontally rather than vertically. Like the others, it is used when you need to find things in a table or range only by column. It does this by only looking for a value that appears in the top-most row of a table and then returns the corresponding value from any other row that you specify.

For example, let's suppose that you want to find unit price for "USB Cable" product. To do this, you would enter the following formula:

As you can see, the value that you are looking up is entered first ("USB Cable"), followed by the lookup area (A1:D3) that includes the whole range (or table). Following this is the row index number. Rows in the selected range or table are numbered from top to bottom, with the first row being 1, the next 2, and so on. In this example, as we are looking for the unit price, we entered 3 for the third row. Finally, you can then choose between looking for approximate matches or exact. In this example FALSE was chosen as we wanted a direct match.

The result returned by the formula is 4.99:

The MATCH Function

= MATCH(lookup_value, lookup_array, [match_type])

The MATCH function searches for a value in a range of cells and then returns its position. This function requires two arguments: the value that you are searching for, followed by the range of cells that you would like to search. Note that this function is not case-sensitive.

You can also use the optional match type argument to customize the function's behavior:

Match_Type	Behavior
1 *(or omitted)*	Finds the largest value that is less than or equal to the lookup value. Requires the lookup array argument values to be in ascending order.
0	Finds the first value exactly matching the lookup value argument.
2	Finds the smallest value that is greater than or equal to the lookup value. Requires the lookup array argument values to be in descending order.

For example, let's suppose that you want to find the most expensive product in this worksheet:

	A	B	C
1	Product #	Product Name	Unit Price
2	548946	USB Cable	4.99
3	48946	Keyboard	29.99
4	15467	Wireless Mouse	49.99

To do this using a MATCH function, you would use the following formula:

We know we do not sell any products over $1,000, so we have entered that as the lookup value, followed by the lookup area (Column C). We have also omitted the match type argument as we want the default behavior.

In this case, results are returned showing the most expensive product is in Row 4 of our dataset:

The INDEX Function

INDEX(reference, row_num, [column_num], [area_num])

The INDEX function returns a value from a table or range. It also offers an alternative syntax which allows you to use it with an array:

INDEX(array, row_num, [column_num])

For example, let's suppose that you want to find the value at the very end of this range:

	A	B	C
1	Product #	Product Name	Unit Price
2	548946	USB Cable	4.99
3	48946	Keyboard	29.99
4	15467	Wireless Mouse	49.99

To do this using an INDEX function, you would use the following formula:

SUM   ✕ ✓ *f*ₓ   =INDEX(A1:C4,4,3)

	A	B	C	D	E	F	G
1	Product #	Product Name	Unit Price			=INDEX(A	
2	548946	USB Cable	4.99				
3	48946	Keyboard	29.99				
4	15467	Wireless Mouse	49.99				

In this case, the value in Row 4, Column 3 (C4) is returned:

	A	B	C	D	E	F
1	Product #	Product Name	Unit Price			49.99
2	548946	USB Cable	4.99			
3	48946	Keyboard	29.99			
4	15467	Wireless Mouse	49.99			

Activity 1-3: Analyzing Data Using Lookup Functions

Using a lookup function, you would like to find the total amount of sales that were made by an employee.

12. To begin, open Activity 1-3 from your Exercise Files folder:
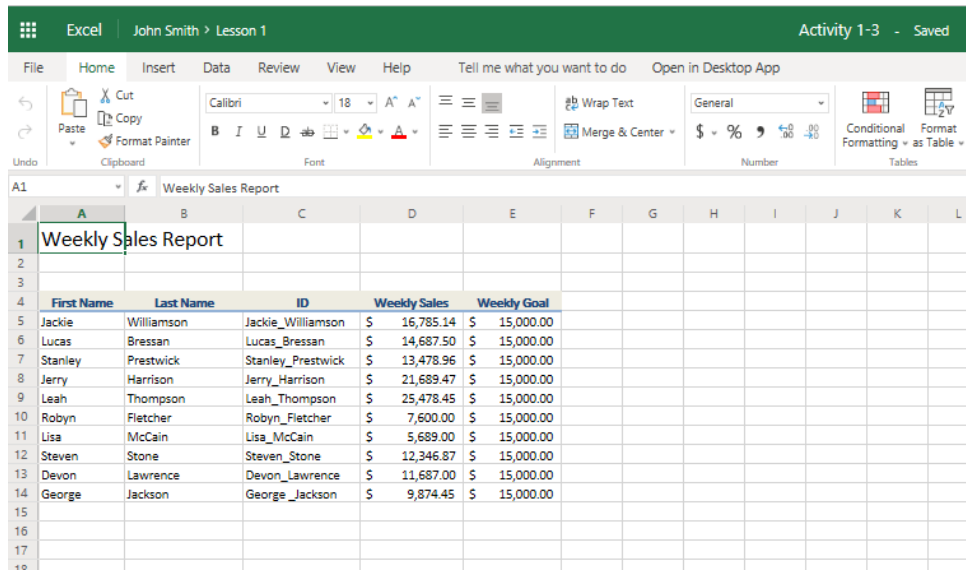
13. Click cell D1 to place your cursor there:
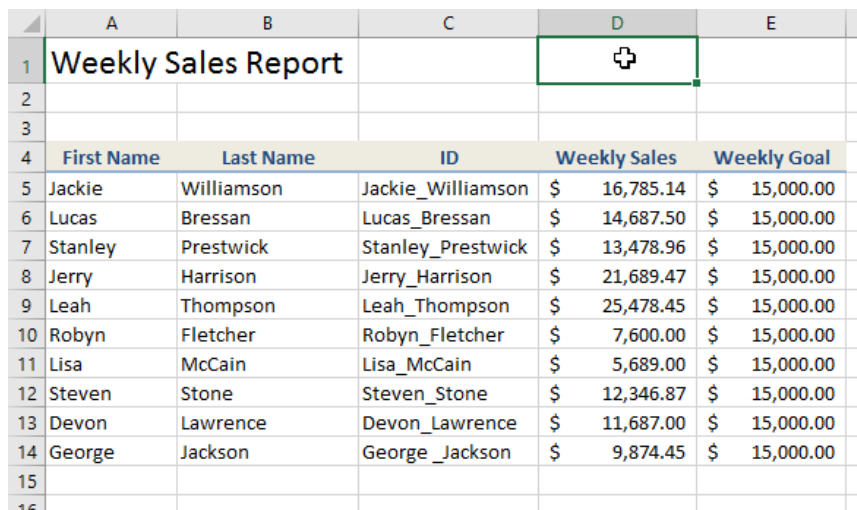
14. You would like to find out the weekly sales made by Lucas, so start by typing =VLOOKUP("Lucas", into the Formula Bar:
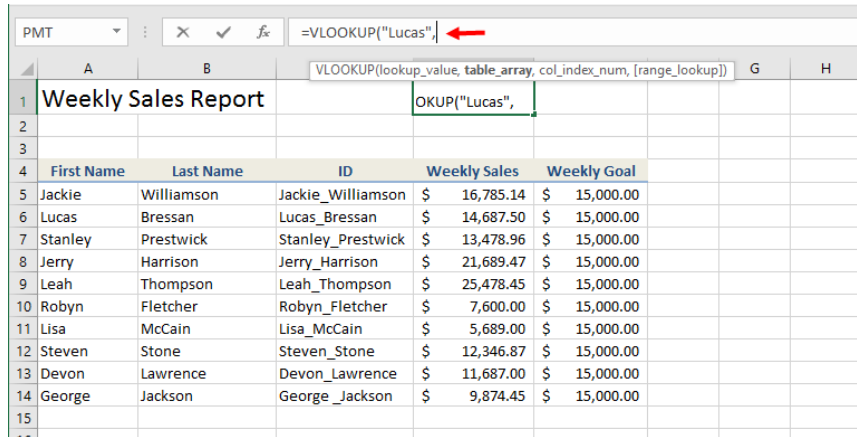
15. Next, you need to add the cell range that you are working with. For this example, type "A5:E14," (without quotation marks), following the comma:
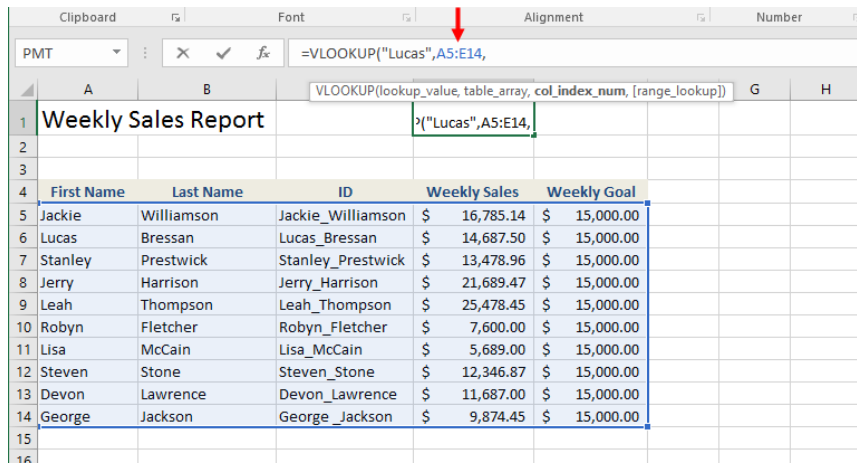
16.   Now you need to enter the column whose data you would like to use as a result. In this case you want the weekly sales to be shown, so type "4," as the Weekly Sales column is further from the left:
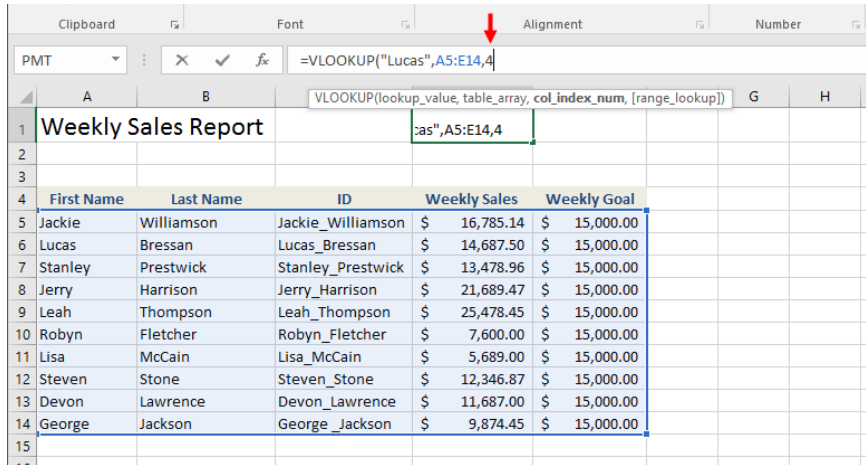
17.   Finally, you need to decide if you would like only exact matches to be used or approximate matches. For this example, you would like exact matches, so type "FALSE" followed by a closing parenthesis:
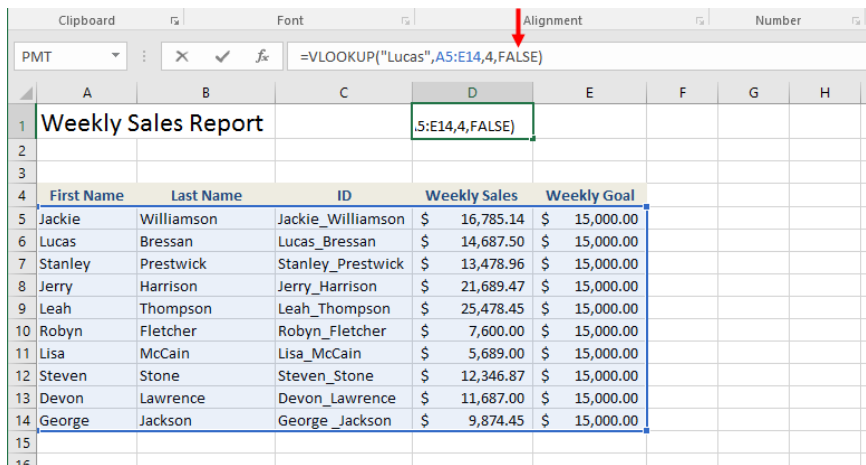
18. With the formula now completed, press Enter. The weekly sales made by Lucas will now be shown in D1:

	A	B	C	D	E
1	Weekly Sales Report			14687.5 ⬅	
2					
3					
4	First Name	Last Name	ID	Weekly Sales	Weekly Goal
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 15,000.00
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 15,000.00
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 15,000.00
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 15,000.00
14	George	Jackson	George _Jackson	$ 9,874.45	$ 15,000.00
15					

19. Save the changes that you have made to the workbook as 'Activity 1-3 Complete' and then close Microsoft Excel to complete this exercise.

TOPIC D: Use Date Functions

Entering the current date and time into a worksheet is one of the more common tasks that you will complete using Excel. In this session, you will learn how to add date information using the TODAY and NOW date functions.

Topic Objectives

In this session, you will learn:

- About the TODAY function

- About the NOW function

- How to serialize dates and times with functions

The TODAY Function

About as simple as a function can get, the TODAY function has no arguments:

=TODAY()

When executed, it will simply print today's date into a cell:
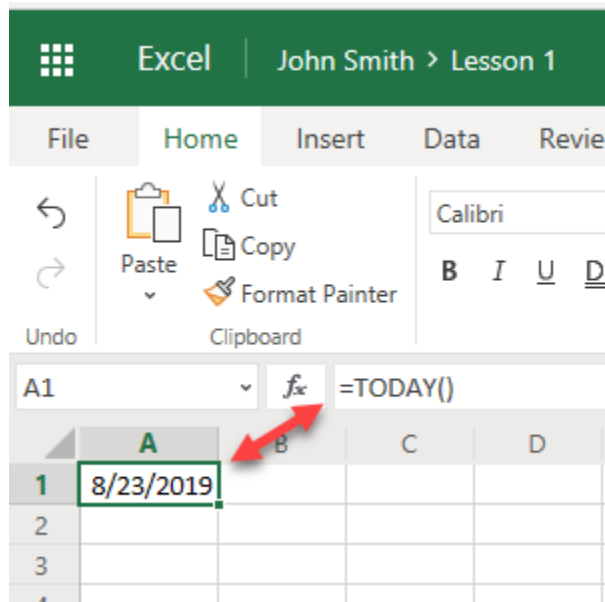
If you wish, you can customize this function's output by changing the number format to Short Date or Long Date, depending on your requirements.

The NOW Function

The NOW function is also very simple and uses no arguments:

=NOW()

It will print the current date and time into the cell where the function is placed:
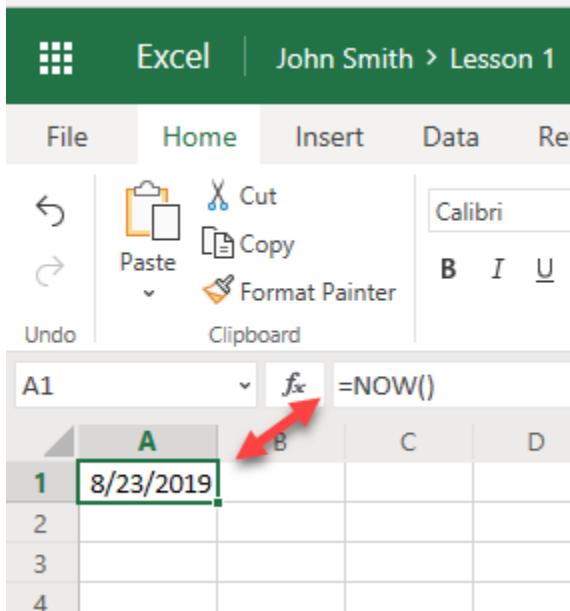
Usually this function is used in conjunction with others to complete time calculations.

Serializing Dates and Times with Functions

If you are using formulas where you only need the month or a specific time of day, there are several different functions that you can use to gather that information from an original serial value. For example, here you can see the YEAR, MONTH, DAY, HOUR, MINUTE, and SECOND functions serializing the date in A1 and the time in A2:

◢	A	B	C	D	E
1	Monday, December 7, 2015		YEAR	2015	
2	12:45:01 PM		MONTH	12	
3			DAY	7	
4			HOUR	12	
5			MINUTE	45	
6			SECOND	1	
7					
8					

Each of these functions only accept one argument – a reference to the cell that contains the date or time value. For example, here you can see an example of the YEAR function pointing to cell A1:

=YEAR(A1)

Activity 1-4: Analyzing Data Using Date Functions

You would like to fill out an invoice tracking sheet using some of the date functions that you learned about in this topic.

1. To begin, open Activity 1-4 from your Exercise Files folder:
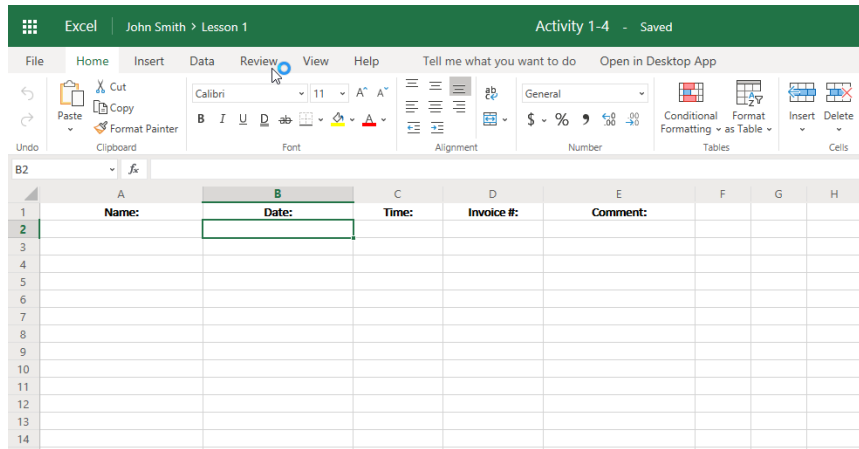
2. Ensure that cell B2 is selected and then type "=TODAY()" into the formula bar:
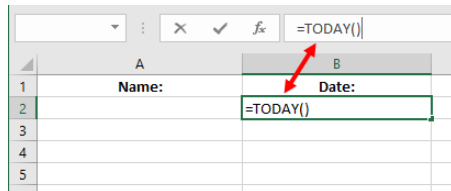
3. Press "Enter" and the current date will be shown as a value in previously selected cell:
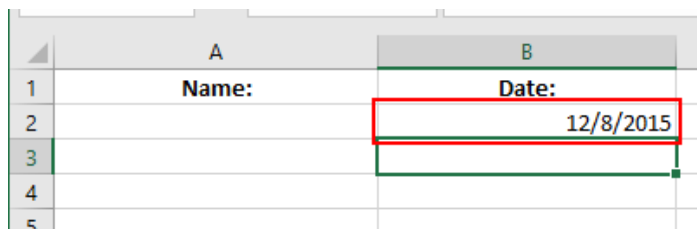
4. Click cell C2 and type "=NOW()" into the formula bar:

	B	C	
	Date:	Time:	
	12/8/2015	=NOW()	
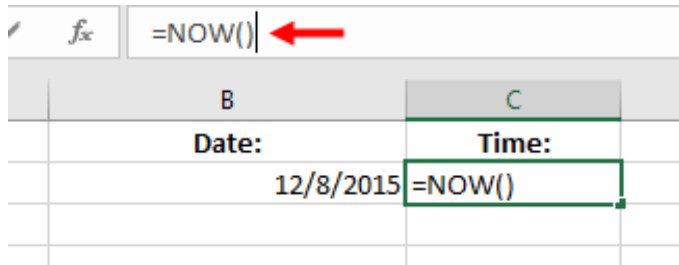
5. Press the Enter key and the current date and time will be the value shown in the previously selected cell:

	B	C	
	Date:	Time:	Inv
	12/8/2015	12/8/2015 15:23	
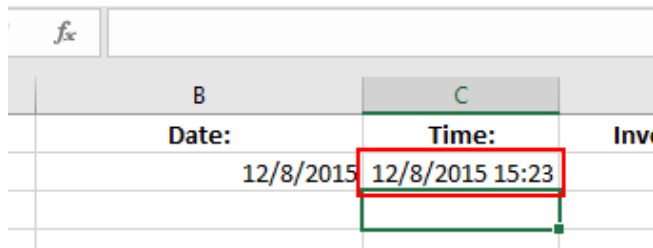
6. Select cell C2 once again. Change the number format to Time by clicking Home → Number Format → Time:

C2 =NOW()

	A	B	C	D
1	Name:	Date:	Time:	Invoice #:
2			12/8/2015	12/8/2015 15:23
3				
4				
5				
6				
7				
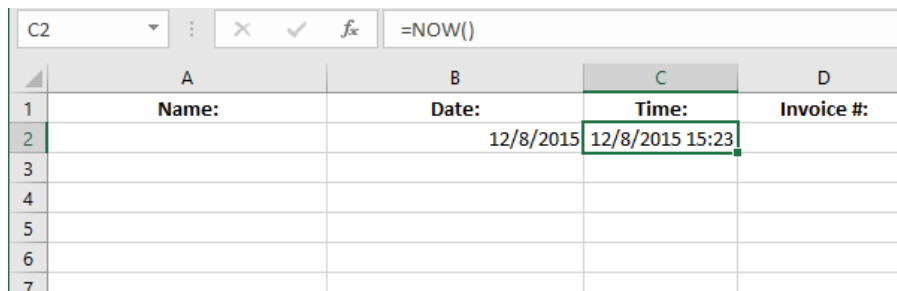
7. With the time number format applied to the selected cell, you will see that its value will now only show the current time:

=NOW()

	B	C	D	E
	Date:	Time:	Invoice #:	Comment:
	12/8/2015	3:23:31 PM		
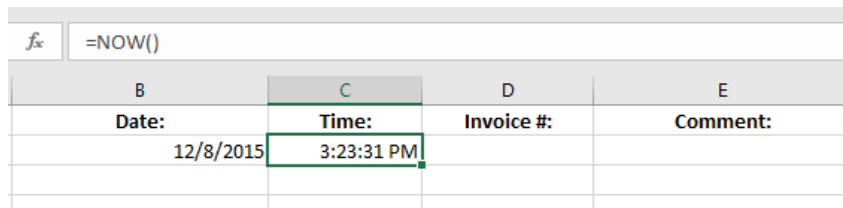
8.   Save the current workbook as 'Activity 1-4 Complete' and then close Microsoft Excel to complete this exercise.

TOPIC E: Use Financial Functions

As Microsoft Excel is widely used by many accounting and finance professionals, it includes several special financial functions. For example, some financial functions can be used to calculate loan interest, while others can be used to determine the value of investments over time. In this session you will learn about the four major financial functions that are available in Excel 365.

Topic Objectives

In this session, you will learn:

- About the IPMT function

- About the PPMT function

- About the NPV function

- About the FV function

The IPMT Function – Interest Payment Function

=IPMT(rate, per, nper, pv [fv], [type])

The IPMT function is used to calculate the interest payment that is due for a period on a loan that has a fixed interest rate with regular payments. Alternatively, this function could also be used to calculate the return per period on an investment with the same restrictions.

The **rate** argument is where you declare the interest rate per period. For example, if you were trying to calculate the interest payment on a loan that has a three per cent annual interest rate, you would divide three per cent by 12.

The **per** argument is the period over which you need to calculate the interest. For example, if the period of the loan was four years and payments are being made monthly, the per argument would be 48. If annual payments were being made, the per argument would be four.

The total number of payments for the loan or investment are entered as the **nper** argument. For example, if payments were being calculated on a three-year investment, nper would be 36.

Finally, the **pv** argument is where you enter the principal of the loan or total amount of money being invested.

In addition to the required argument, the IPMT function includes two optional arguments: fv and type. The **fv** argument is used to enter the future value of the investment after all payments have been made to it, or if working with a loan, the balance of the loan. If you choose not to set this argument, it will default to 0 (the typical balance of a loan after all the payments are made). Finally, the **type** argument is used to indicate if payments are due at the end of each payment period (indicated by "0" or by omitting the argument), or at the beginning (indicated by "1"). If left blank, this argument will default to 0.

Suppose that in a worksheet, A1 contains the value of $15,000, while cell B1 holds the value 6%, and C1 contains the value 4:

	A	B	C
1	$15,000.00	6%	4

With that information in mind, below you can see how an IPMT function could be constructed to determine how much interest the borrower would owe one and a half years into the four-year loan:

Function	Description	Result
=IPMT(B1/12, 18, C1*12, A1)	This function will calculate the how much interest a borrower will owe for the loan (A1), one and a half years into the term (18) with an annual interest rate of 6% (B1/12) and a total term of four years (C1*12).	($50.46)

If this were from the lender's perspective, the function would be almost the same, but the principal would be a negative value as they would be paying that out. This would result in a positive result rather than a negative one.

Function	Description	Result
=IPMT(B1/12, 18, C1*12, -A1)	This function will calculate how much interest is owed to you as the lender of the loan (-A1), one and a half years into the loan (18) with an annual interest rate of 6% (B1/12) and a total term of four years (C1*12).	$50.46

The PPMT Function – Principal Payment Function

=PPMT(rate, per, nper, pv, [fv], [type])

The PPMT (payment) function is used to calculate the amount owed against the principal on a loan (or gained from an investment) over a select period and a fixed interest rate. Like the IPMT function, the PPMT function uses the exact same arguments: rate, per, nper, pv, [fv], and [type]. You could even add the result from the same period of the same loan calculated by the IPMT function to the result using the same arguments from the PPMT function to calculate the total payment for the selected period.

Suppose that in a worksheet, A1 contains the value of $15,000, while cell B1 holds the value six per cent and C1 contains the value four:

	A	B	C
1	$15,000.00	6%	4

With that information in mind, below you can see how a PPMT function could be constructed to determine the required payment on the principal of a loan, one and a half years into the four-year loan:

Function	Description	Result
=PPMT(B1/12, 18, C1*12, A1)	This function will calculate the amount owed to the principal of a loan (A1), one and a half years into the loan (18) with an annual interest rate of 6% (B1/12) and a total term of four years (C1*12).	$(301.81)

The NPV Function – Net Present Value Function

=NPV(rate, value1, [value2], …)

If you are unfamiliar with NPV (net present value) calculations, they are used to compare the value of money today to the value of money in the future, taking inflation and returns into account. In particular, the NPV function is used to calculate the net present value of an asset or investment using the estimated (or known) future cash flow, as well as the discount rate per period.

The **rate** argument in this function is used to declare the discount rate per period. The **value** arguments are used to represent any future cash flow. For example, suppose that an initial cost of $75,000 was incurred (A1) with a discount rate of nine per cent (A2). The cash flows for the next consecutive four years are $16,000, $14,000, $12,000, and $10,000 (A3:A6) respectively:

	A	B
1	$(75,000.00)	
2	9%	
3	$ 16,000.00	
4	$ 14,000.00	
5	$ 12,000.00	
6	$ 10,000.00	
7	$42,812.87	

The NPV function could then be constructed as follows:

Function	Description	Result
=NPV(A2, A3:A6)	This function will calculate the net present value of $75,000 with a discount rate of 9% (A2) and future cash flow (A3:A6).	$42,812.87

Keep in mind that the output from this formula does not include the initial cost. To factor that into the result, you would subtract the result from the initial cost. With that in mind, the NPV for this example would be $32,187.13.

The FV Function – Future Value Function

=FV(rate, nper, pmt, [pv], [type])

The FV function is used to calculate the future value of an investment that has a fixed interest rate, as well as a fixed or periodic payment schedule. Like most of the other financial functions covered in this topic, the FV function uses many of the same arguments.

The **rate** argument is where you declare the interest rate per period. For example, if you were trying to calculate the interest payment on an investment that has a three per cent annual interest rate, you would divide .03 (or 3%) by 12 and enter that result (.0025 in this case) as the argument.

The total number of periods from now that you want to use to calculate the future value of the investment are entered as the **nper** argument. Keep in mind that the periods entered are the same as the ones used to calculate the rate argument e.g. 25 yeas x 12 months per year.

The **pmt** argument is where you enter the payment that is being made for each period. For example, if you were paying $200 a month into this investment over 10 years, you would enter 200 as the pmt value. It would also mean that the nper value would be 120 (12 x 10).

In addition to the required argument, the FV function includes two optional arguments: pv and type. The **pv** argument is used to enter the present value of the investment. This would be used if you need to calculate the future value of a one-time investment that has a fixed interest rate. The **type** argument is used to indicate if payments are due at the end of each payment period (indicated by "0" or by omitting the argument), or at the beginning (indicated by "1"). If left blank, this argument will default to 0.

Suppose that in a worksheet, A1 contains the value of -$15,000 (initial investment), while cell B1 holds the value six per cent (annual interest), and C1 contains the value -$200 (additional monthly payments). As well, assume that the investor wants to contribute the additional monthly payments for a period of 25 years:

	A	B	C
1	$ (15,000.00)	6%	$(200.00)
2			

With that information in mind, below you can see how an FV function could be constructed to determine the future value of this investment:

Function	Description	Result
=FV(B1/12, 25*12, C1, A1)	This function will calculate the future value of the initial investment (A1), combined with a monthly contribution of (C1) over a period of 25 years (25*12) with a fixed annual interest rate of 6% (B1/12).	$205,573.34

Note that because you are calculating an investment, the initial payment (pv) and monthly payment (pmt) need to be entered as negative values to receive a positive result. On the other hand, entering positive values would result in a negative value.

Activity 1-5: Using Financial Functions

You have been given the task of calculating the net present value of an investment, as well as calculating the future value of an investment.

1.   To begin, open Activity 1-5 from your Exercise Files folder:

2. Let's start with the NPV calculation. Click inside cell B8 to select it:

	A	B
1	**CALCULATE NET PRESENT VALUE**	
2	**Initial Investment**	$ (250,000.00)
3	**Discount Rate**	3%
4	**Cash Flow Year 1**	$ 210,000.00
5	**Cash Flow Year 2**	$ 190,000.00
6	**Cash Flow Year 3**	$ 150,000.00
7	**Cash Flow Year 4**	$ 110,000.00
8	**Net Present Value**	✛
9		
10		
11	**CALCULATE FUTURE INVESTMENT**	
12	**Initial Investment**	$ (1,500.00)
13	**Annual Interest Rate**	5%
14	**Monthly Contribution**	$ (300.00)
15	**Value After 25 Years**	
16		

3. Next, in the Formula Bar, type "=NPV(":

| PMT | | : | ✕ | ✓ | *fx* | =NPV(| ⬅ |

	A	B	C	D	E
1	CALCULATE NET PRESENT VALUE				
2	Initial Investment	$ (250,000.00)			
3	Discount Rate	3%			
4	Cash Flow Year 1	$ 210,000.00			
5	Cash Flow Year 2	$ 190,000.00			
6	Cash Flow Year 3	$ 150,000.00			
7	Cash Flow Year 4	$ 110,000.00			
8	Net Present Value	=NPV(			
9					

4. Now you need to enter the discount rate (rate argument). In this example it is three per cent, so enter the B3 cell reference:

	A		C	D
	PMT ▾ ⋮ ✕ ✓ *fx* =NPV(B3			
	A	NPV(rate, value1, [value2], ...) C		D
1	CALCULATE NET PRESENT VALUE			
2	Initial Investment	$ (250,000.00)		
3	Discount Rate	3%		
4	Cash Flow Year 1	$ 210,000.00		
5	Cash Flow Year 2	$ 190,000.00		
6	Cash Flow Year 3	$ 150,000.00		
7	Cash Flow Year 4	$ 110,000.00		
8	Net Present Value	=NPV(B3		
9				

5. The future cash flow (value argument) now needs to be entered. Add a comma and then enter the B4:B7 range followed by a closing parenthesis:

	A	B	C	D	E
	PMT ▾ ⋮ ✕ ✓ *fx* =NPV(B3, B4:B7)				
	A	B	C	D	E
1	CALCULATE NET PRESENT VALUE				
2	Initial Investment	$ (250,000.00)			
3	Discount Rate	3%			
4	Cash Flow Year 1	$ 210,000.00			
5	Cash Flow Year 2	$ 190,000.00			
6	Cash Flow Year 3	$ 150,000.00			
7	Cash Flow Year 4	$ 110,000.00			
8	Net Present Value	V(B3, B4:B7)			
9					

6. Press "Enter" to apply the new function. You will see the result in the currently selected cell:

	A	B	C
1	CALCULATE NET PRESENT VALUE		
2	Initial Investment	$ (250,000.00)	
3	Discount Rate	3%	
4	Cash Flow Year 1	$ 210,000.00	
5	Cash Flow Year 2	$ 190,000.00	
6	Cash Flow Year 3	$ 150,000.00	
7	Cash Flow Year 4	$ 110,000.00	
8	Net Present Value	$617,981.54 ⬅	
9			
10			

7. Keep in mind that this result does not factor in the initial cost (B2). In order to calculate the true NPV of this investment, the initial cost of the investment needs to be subtracted from the value that was returned from the NPV function. In this example, the NPV for this investment would be $367,981.54.

8. Next, you need to calculate the future investment value using the information a little lower on this worksheet. Click to select cell B15:

	A	B
4	Cash Flow Year 1	$ 210,000.00
5	Cash Flow Year 2	$ 190,000.00
6	Cash Flow Year 3	$ 150,000.00
7	Cash Flow Year 4	$ 110,000.00
8	Net Present Value	$617,981.54
9		
10		
11	**CALCULATE FUTURE INVESTMENT**	
12	Initial Investment	$ (1,500.00)
13	Annual Interest Rate	5%
14	Monthly Contribution	$ (300.00)
15	Value After 25 Years	➕
16		

9. Inside the Formula Bar, type "=FV(B13/12":

f_x	=FV(B13/12 ⬅			
	FV(rate, nper, pmt, [pv], [type]) C		D	E
	$ 210,000.00			
	$ 190,000.00			
	$ 150,000.00			
	$ 110,000.00			
	$617,981.54			
	VESTMENT			
	$ (1,500.00)			
	5%			
	$ (300.00)			
	=FV(B13/12			

10. Now you need to add the period from now that you wish to use to calculate the future value (nper). In this example it is 25 years, so in the Formula Bar add a comma and then type "25*12":

11. Next, you need to declare what the monthly contribution to this investment will be after the initial investment (pmt). In the Formula Bar, add a comma and type the "B14" cell reference:

	A	FV(rate, nper, pmt, [pv], [type]) C	D	E
4	Cash Flow Year 1	$ 210,000.00		
5	Cash Flow Year 2	$ 190,000.00		
6	Cash Flow Year 3	$ 150,000.00		
7	Cash Flow Year 4	$ 110,000.00		
8	Net Present Value	$617,981.54		
9				
10				
11	CALCULATE FUTURE INVESTMENT			
12	Initial Investment	$ (1,500.00)		
13	Annual Interest Rate	5%		
14	Monthly Contribution	$ (300.00)		
15	Value After 25 Years	12, 25*12, B14		
16				
17				

12. Finally, you need to enter the present value of the investment (pv). In the Formula Bar, add a comma and then type B12 followed by a closing parenthesis:

13. Press "Enter" to apply the new formula. You will see that the value of this investment will be $183,874.85 after 25 years of contributions and the initial investment of $1,500:

10	
11 **CALCULATE FUTURE INVESTMENT**	
12 **Initial Investment**	$ (1,500.00)
13 **Annual Interest Rate**	5%
14 **Monthly Contribution**	$ (300.00)
15 **Value After 25 Years**	$183,874.85
16	
17	
18	

14. Save your changes as 'Activity 1-5 Complete' and close Microsoft Excel.

Summary

In this lesson you learned how to analyze data in your worksheets using a variety of different functions. You learned how to use text functions to manage and manipulate text, as well as date functions to return date information. Additionally, you learned about the many different financial functions that are available to you and how they operate.

LESSON 2:
ORGANIZING WORKSHEET DATA WITH TABLES

Lesson Objectives

In this lesson you will learn how to:

- Create and modify tables

- Sort data and filter data

TOPIC A: Create and Modify Tables

While formulas and functions are great at analyzing data within your workbook, they are more apt at analyzing entire workbooks rather than specific sets of data. If you need to analyze smaller sets of data within a large workbook or break down large sets of data into smaller parts, then converting your data into tables is often the best solution. Tables allow you to use Excel's powerful organizational capabilities without modifying the data itself. Using tables, you can narrow down specific data, focus on only the important information, and more.

Topic Objectives

In this session, you will learn:

- About tables

- About the components of a table

- How to use the Create Table dialog box

- About the Table Tools – Design contextual tab

- How to use and apply table styles, as well as Quick Styles

- How to customize row display

- About table modification options

Tables

A **table** is a specially designated range of information that has added functionality. You can have multiple tables per worksheet, and tables can be as large or small as the amount of data you want to work with. Tables can be created from existing data ranges or from empty ranges and then populated afterwards. Once a table has been created, it will automatically be given a generic name such as "Table1" or "Table2" depending upon the number of tables present in the current worksheet; however, these names can be changed at any time. Additionally, tables are flexible in that you can convert a table back to a normal range at any point without affecting the contents.

A table is made from adjacent columns of data, with a unique label or heading for each column. Columns and rows may be added to a table just as you would when working with a normal range.

Remember that each worksheet has a lot more rows than columns. This design is well suited for data organized in long, adjacent, list-like columns:

	A	B	C	D	E
1	**Weekly Sales Report**				
2					
3					
4	First Name ▾	Last Name ▾	ID ▾	Weekly Sale{ ▾	Weekly Goa ▾
5	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00
6	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00
7	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00
8	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00
9	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00
10	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 15,000.00
11	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 15,000.00
12	Steven	Stone	Steven_Stone	$ 12,346.87	$ 15,000.00
13	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 15,000.00
14	George	Jackson	George _Jackson	$ 9,874.45	$ 15,000.00
15					

Table Components

Several components come together to create a table. Some of these components, such as the header row and banded rows, are required, but other components can be toggled on or off. Below you can see a table with many of the components toggled on:

Here is an overview of each element.

- The **Header row (1)** will display the column headers for each column in the table. For each header within the Header row, you will see the **Header row drop-down arrow (2)**. This is used to access a variety of organizational commands.

- **Banded rows (6)** allow you to easily differentiate between each row that appears within the table, while the **Total row (3)** is used to display the results of calculations that are done on a column-by-column basis. The Total row also includes the Total row drop-down arrow when selected. This gives you quick access to functions that can perform calculations on the table data. Note that this component will only be displayed if a cell in the Total row is selected.

- Finally, the **First column (4)** option will apply a bold effect to the first column in the table to differentiate it from other columns. The **Last column (5)** option, when applied, will do the same thing to the last column of data.

The Create Table Dialog Box

The Create Table dialog box is used to convert existing ranges of data into a table. Additionally, this dialog box also allows you to choose if you want to include the top row of the selected range in the new table as a header row.

To access this dialog box, select the cell range that you would like to convert into a table and then click Insert → Table:
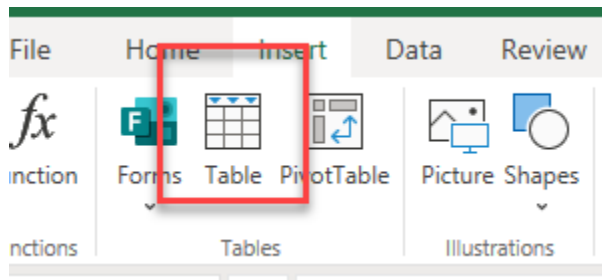
The Create Table dialog box will open. You will see the selected range (using absolute cell references) in the "Where is the data for your table?" text box:
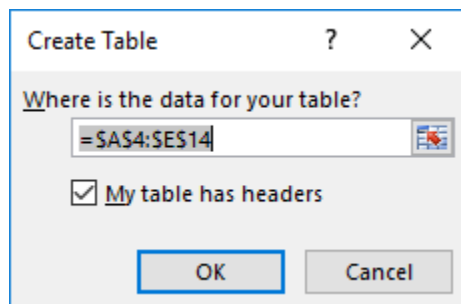
Clicking the OK button will convert the selected cell range into a table.

Table Modification Options

Tables can be modified like any worksheet found in Excel. To insert a new row, select the table row below where you want to insert one or more blank table rows. Next, click Home → Insert → Insert Table Rows Above:
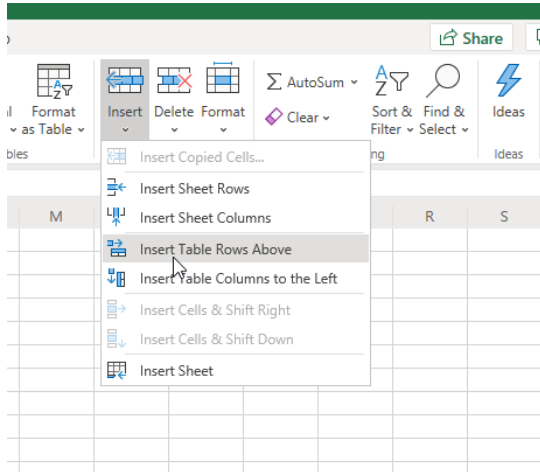
A new blank row will then be added above the selected row, shifting everything below this row downwards:

First Name	Last Name	ID	Weekly Sales	Weekly Goal
Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00
Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00
Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00
Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00
Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00
Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 15,000.00
Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 15,000.00
Steven	Stone	Steven_Stone	$ 12,346.87	$ 15,000.00
Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 15,000.00
George	Jackson	George _Jackson	$ 9,874.45	$ 15,000.00

Similarly, you can add new columns by selecting the table column to the right of where you want to insert a new column. Next, click Home → Insert → Insert Table Columns to Left.

Activity 2-1: Creating and Modifying a Table

You have decided that because the Weekly Sales & Bonus Payout worksheet will grow on a weekly basis, it is a good idea to convert the range into a table to facilitate data analysis. You would also like to apply a new table style to it.

1. To begin, open Activity 2-1 from your Exercise Files folder:

2. First, use your cursor to select the A4:G14 cell range:

3. Next, click Insert → Table:

4. In the Create Table dialog box, you will see that the range you previously selected is listed inside the "Where is the data for your table?" text box:
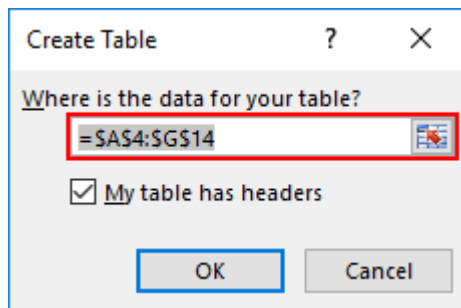
5. Ensure that the "My table has headers" checkbox is checked and click "OK:"
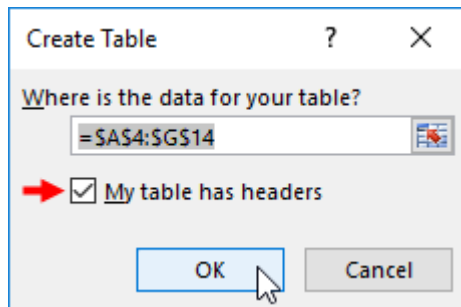
6.   You will see that the previously selected range has now been converted into a table:

	A	B	C	D	E	F	G	H
1	**Weekly Sales & Bonus Payout**							
2								
3								
4	Week ▾	First Nam ▾	Last Name ▾	ID ▾	Weekly Sale ▾	Weekly Go: ▾	Bonu ▾	
5	1	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	$ 500.00	
6	1	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00	$ -	
7	1	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00	$ -	
8	1	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00	$ 500.00	
9	1	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00	$ 500.00	
10	1	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 15,000.00	$ -	
11	1	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 15,000.00	$ -	
12	1	Steven	Stone	Steven_Stone	$ 12,346.87	$ 15,000.00	$ -	
13	1	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 15,000.00	$ -	
14	1	George	Jackson	George _Jackson	$ 9,874.45	$ 15,000.00	$ -	
15								

7.   Save your work as 'Activity 2-1 Complete' and then close Microsoft Excel.

TOPIC B: Sort and Filter Data

The data that populates your worksheets is typically randomly sorted. This can cause a problem if you need to conduct data analysis or simply get a better grasp of the data at hand. Using tables, you can quickly sort and filter data in several different ways to best suit your goals. In this session, you will learn how to sort and filter data in tables and ranges.

Topic Objectives

In this session, you will learn:

- About the difference between sorting and filtering

- About sorting data

- About advanced filtering

- About filter operators

- How to remove duplicate values

The Difference Between Sorting and Filtering

Typically, you are able to sort worksheet data alphabetically or numerically in ascending or descending order, but there are also options to sort data based on date and time, and even cell color. While you can sort by either row or column, the vast majority of sorting is done by column due to how most worksheets are constructed. Additionally, multiple sorts can be applied to the same set of data.

Keep in mind when sorting table data that in order to make the most of Excel's table functionality, you should make sure that your table contains headers. This will make the data more meaningful and easier to read, particularly if the data will be given to someone else.

It is also important to keep in mind that when you sort data you are not changing the data in the worksheet; you are only changing how it is displayed. Additionally, while there is no option available to clear a sort and return it back to its original state, the Undo command can have the same effect. Finally, if you apply a sort and then save your workbook, the sort applied will also be saved. This means that if you need to undo a sort, you can only do it in the same session as when the sort was applied.

Note that the sorting of multiple columns or rows in one range or table should only be done if those columns or rows being sorted share some of the same entries. If this is not the case, the sort will tell you nothing of value.

Filtering data limits the amount of data shown in the report based on a selected condition. For example, if you only want to show data from those with the last name Stone, you could use a filter to do that.

Sorting Data

Quick sorting allows you to quickly and easily apply common sorting options to data within the table. Quick sorting can be applied to tables by clicking the pull-down arrow beside the name of the header you want to sort. Then choose an ascending or descending sort option:
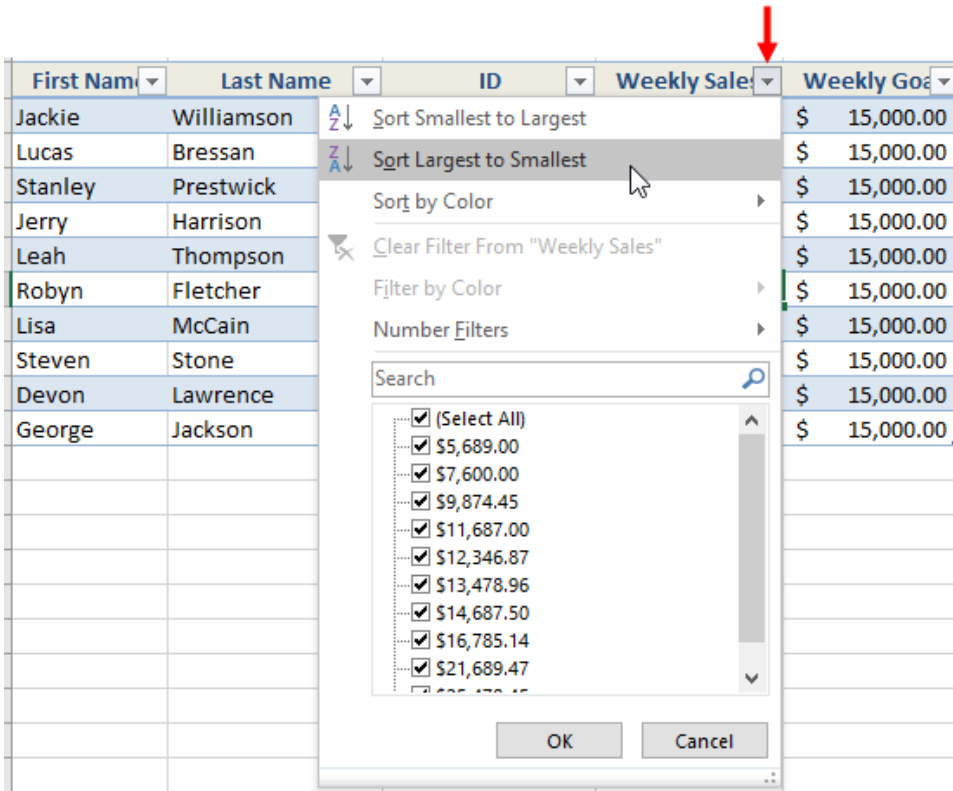
The values will now be sorted in ascending or descending order based on the criteria that you selected. The pull-down arrow beside the header name will also show what type of sort has been applied. In the example below, you can see that the Weekly Sales column is now sorted by largest value to smallest:

First Name ▼	Last Name ▼	ID ▼	Weekly Sales ↓↑	Weekly Goal ▼
Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00
Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00
Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00
Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00
Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00
Steven	Stone	Steven_Stone	$ 12,346.87	$ 15,000.00
Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 15,000.00
George	Jackson	George _Jackson	$ 9,874.45	$ 15,000.00
Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 15,000.00
Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 15,000.00

You can also apply a quick sort by clicking Data → Sort A to Z or Sort Z to A:
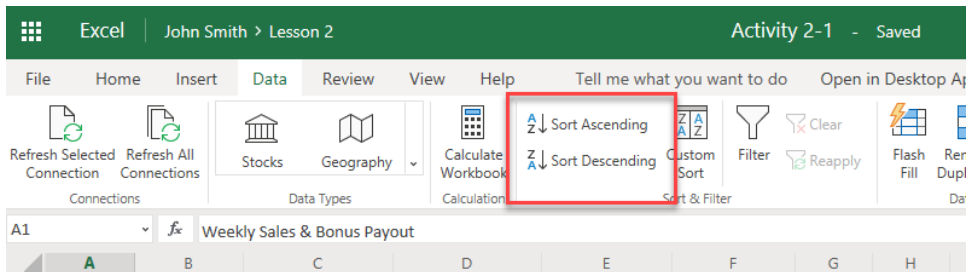
While using quick sorts is a simple way to apply basic sorting to your data, you are limited to sorting one column at a time. Additionally, quick sorts can only be used to sort columns, not rows.

Filter Operators

Like logical operators, filter operators are used to define the criteria for advanced filtering. They are used to narrow down the specific data that you are looking for. You can use them in a variety of combinations.

Below is a breakdown of the filter operators that you can choose from in Excel.

Operator	Example	Action
=	= 1	Will filter out data that is not an exact match to the value entered. Note that because Excel will assume the equals sign is the start of a formula or function, you need to enclose this symbol in double quotations when using it as a filter operator.
>	> 1	Displays only data that is greater than a specified value.
<	< 2	Displays only data that is less than a specified value.
>=	>= 1	Displays only data that is equal to or greater than a specified value.
<=	<= 2	Displays only data that is equal to or less than a specified value.
<>	<> 2	Display only data that is not equal to a specified value.
?	1?	The question mark is used as a wildcard character. You put this character in position where the digit can be any number between zero and nine. For example, if you want to filter for data that starts with a one but is followed by any number, you would enter one.

Removing Duplicate Values

In Excel, duplicate values occur when all values in a single row are identical to all values in another row. Additionally, duplicate values are identified by a value that is displayed in cell – not necessarily the one that is stored. For example, if you have two different date formats (1/22/2018 versus January 22nd, 2018), these values will be determined to be unique. Below, you can see the table contains a duplicate value with the information for Irma being shown twice:

	A	B	C	D
1	Name	Height	Weight	Age
2	Alice	52	128	47
3	Bob	64	179	27
4	Carl	58	194	34
5	Danielle	59	111	18
6	Earl	62	203	59
7	Fern	59	151	33
8	George	69	217	26
9	Harry	63	160	48
10	Irma	67	157	73
11	Jessica	58	110	25
12	Irma	67	157	73

Excel has a built-in function to remove duplicate values where and when necessary. To take advantage of this function, click anywhere inside of the table where the duplicate values occur and then click Data → Remove Duplicates:
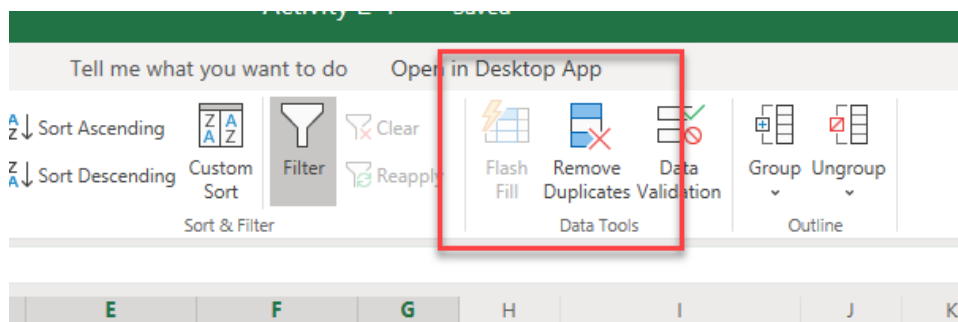
This action will display the Remove Duplicates dialog box. Here, you can select the columns that contains the duplicates that you would like to remove (By default all the columns in the table will be selected). Click "OK:"
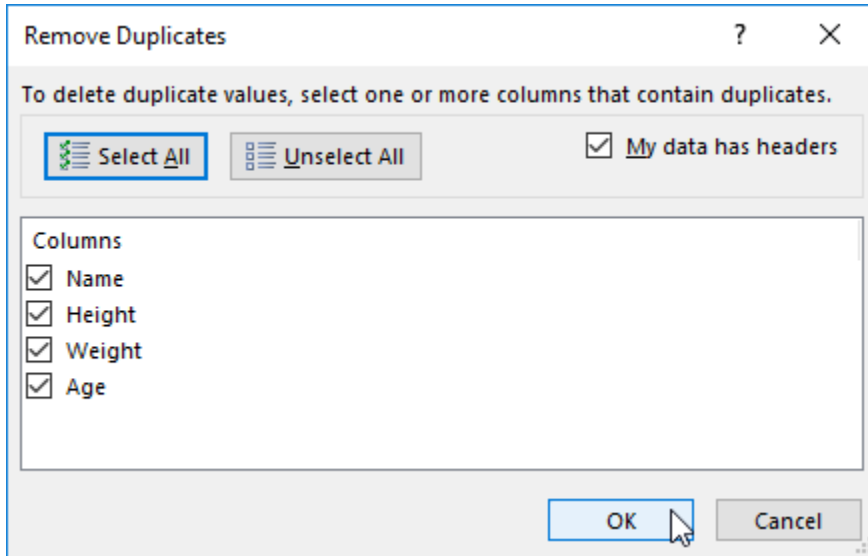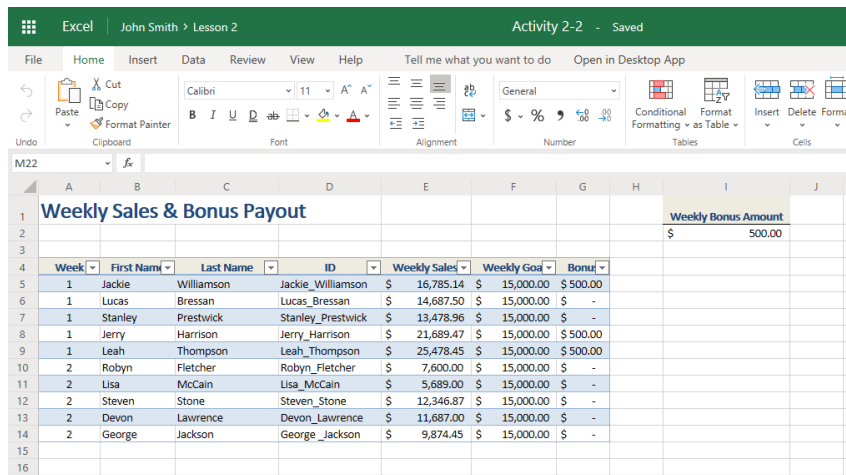
Any duplicate value found will then be removed. A dialog box will appear that informs you of the number of duplicate values found and how many unique values remain:
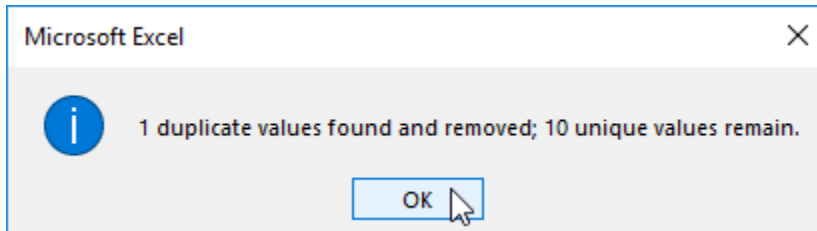
Activity 2-2: Sorting Data

You would like to analyze the top sales associates sorted by week in the Weekly Sales & Bonus Payout worksheet that you have been working on. You will use custom sorts to find this information and then apply a quick sort to the Week column that sorts its data from low to high.

1.   To begin, open Activity 2-2 from your Exercise Files folder:

2.   The data in this worksheet has been formatted into a table. Click to place your cursor on the weekly sales column inside this table to select it and then click Data → Sort Ascending:
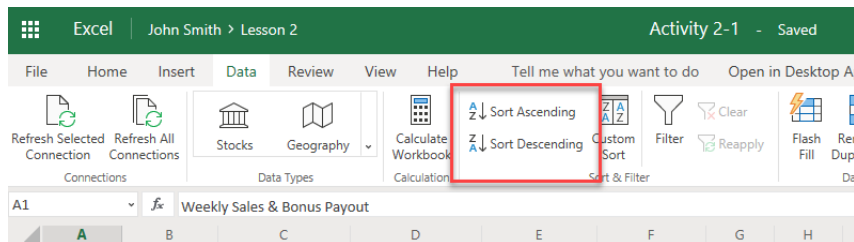
3. The new sort will now be applied to the currently selected table. In this case the data is being sorted first by the Weekly Sales column and then by the Week column. This is helpful in showing you, from largest to smallest, the sales made by each salesperson in each week. Now you can quickly determine the highest and lowest earners by week:

4. Next, you will use a quick sort to sort this data by last name. Click the arrow beside the Last Name column and click "Sort A to Z:"

5. The data in this table will now be sorted alphabetically based on the last names of the sales associates:

	A	B	C	D	E	F	G
1	**Weekly Sales & Bonus Payout**						
2							
3							
4	Week ▾	First Nam ▾	Last Name ↓↑	ID ▾	Weekly Sale: ▾	Weekly Goa ▾	Bonu ▾
5	1	Lucas	Bressan	Lucas_Bressan	$ 14,687.50	$ 15,000.00	$ -
6	2	Robyn	Fletcher	Robyn_Fletcher	$ 7,600.00	$ 15,000.00	$ -
7	1	Jerry	Harrison	Jerry_Harrison	$ 21,689.47	$ 15,000.00	$ 500.00
8	2	George	Jackson	George _Jackson	$ 9,874.45	$ 15,000.00	$ -
9	2	Devon	Lawrence	Devon_Lawrence	$ 11,687.00	$ 15,000.00	$ -
10	2	Lisa	McCain	Lisa_McCain	$ 5,689.00	$ 15,000.00	$ -
11	1	Stanley	Prestwick	Stanley_Prestwick	$ 13,478.96	$ 15,000.00	$ -
12	2	Steven	Stone	Steven_Stone	$ 12,346.87	$ 15,000.00	$ -
13	1	Leah	Thompson	Leah_Thompson	$ 25,478.45	$ 15,000.00	$ 500.00
14	1	Jackie	Williamson	Jackie_Williamson	$ 16,785.14	$ 15,000.00	$ 500.00
15							

Note that this action will overrule the previously applied custom sort. If you wanted to apply that custom sort once again, you would need to reconstruct it from scratch.

6. Save your work as 'Activity 2-2 Complete' and then close Microsoft Excel.

Summary

In this lesson you learned how to organize workbook data. You can create tables, sort data, and apply filters. By taking advantage of all these tools you will be able to learn more about your data than ever before.

LESSON 3:
VISUALIZING DATA WITH CHARTS

Lesson Objectives

In this lesson you will learn how to:

- Create charts

- Modify and format existing charts

TOPIC A: Create Charts

While pure data can be analyzed by those familiar with this data and the tools that Excel provides, sometimes you need graphical assistance to help interpret it. Additionally, charts are an enormous help when people do not have time to study the data and only need a brief overview of the relevant information. In this session, you will learn how to create charts of different types, using different methods in Excel.

Topic Objectives

In this session, you will learn:

- About charts

- About chart types

- How to insert a chart

- How to resize and move a chart

- How to add additional data

Charts

Charts are graphical representations of data and relationships in a dataset. They are commonly used in situations where viewers need to be able to quickly interpret data, without having to wade through the worksheet itself.

For example, here you can immediately see on this chart that A division generates the vast amount of sales within the organization, while D generates the least:
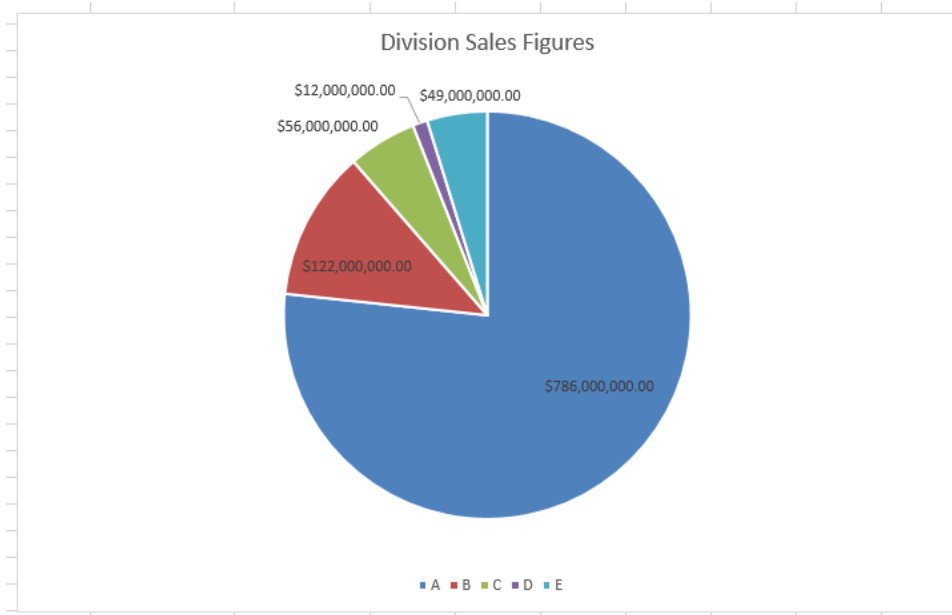
Chart Types

You can choose from different chart types, and each of them are tailored to display specific types of data. Each chart type then has even more sub-types that you can choose from, in order to further customize their appearance. All these chart types and sub-types are accessed using the Insert Chart or Change Chart Type dialog boxes. To open the Insert Chart dialog box, click the Insert tab and click the option button ( ) in the Charts group while the dataset that you would like to represent is selected:
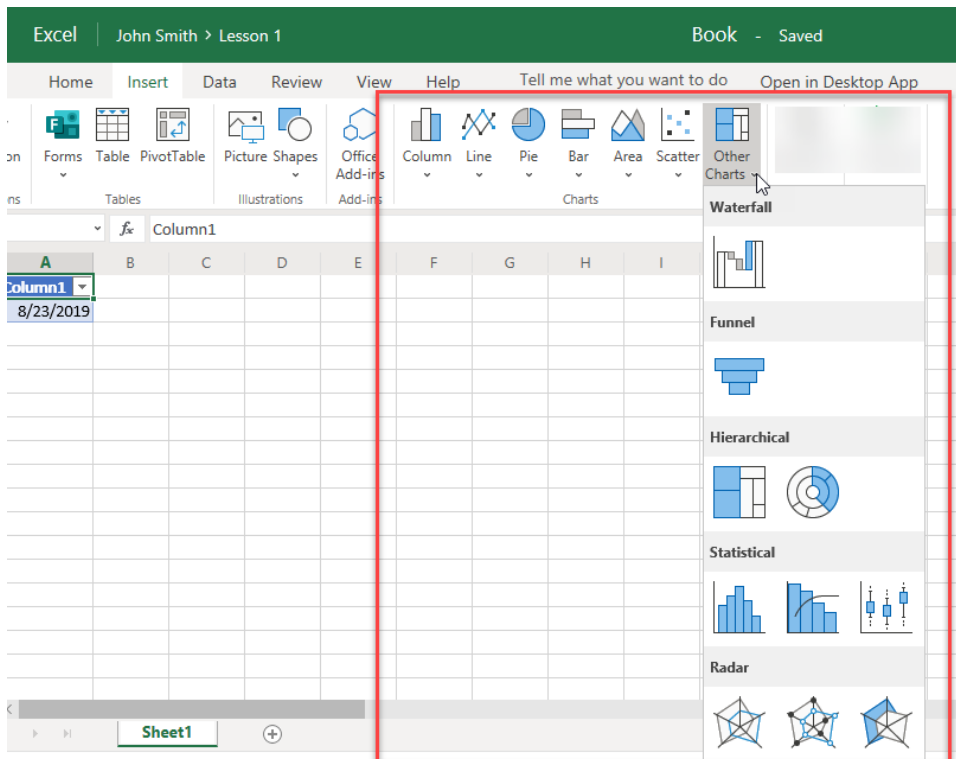
The Insert Chart dialog box consists of two tabs – Recommended Charts and All Charts. The Recommended Charts tab will be displayed by default and will suggest a few chart types that best fit the data that you are trying to represent. Usually, there a few options to choose from with the top-most option being the most recommended one:
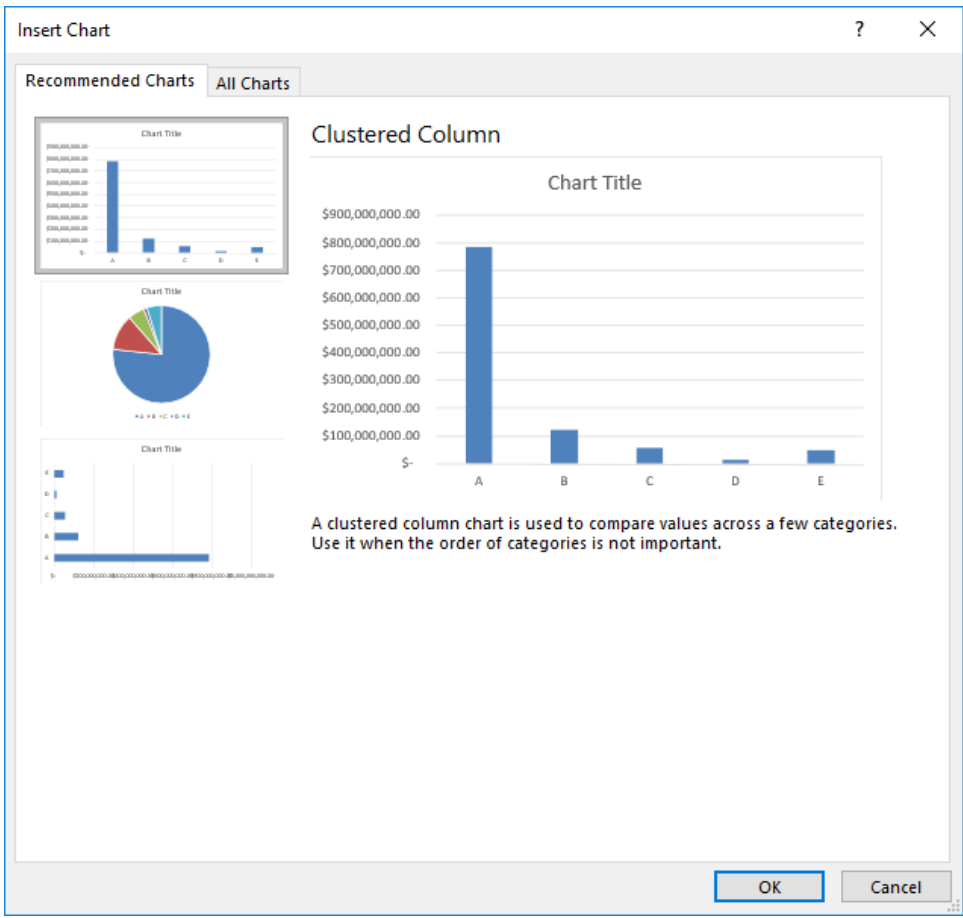
The Other Charts tab displays a list of primary chart types:
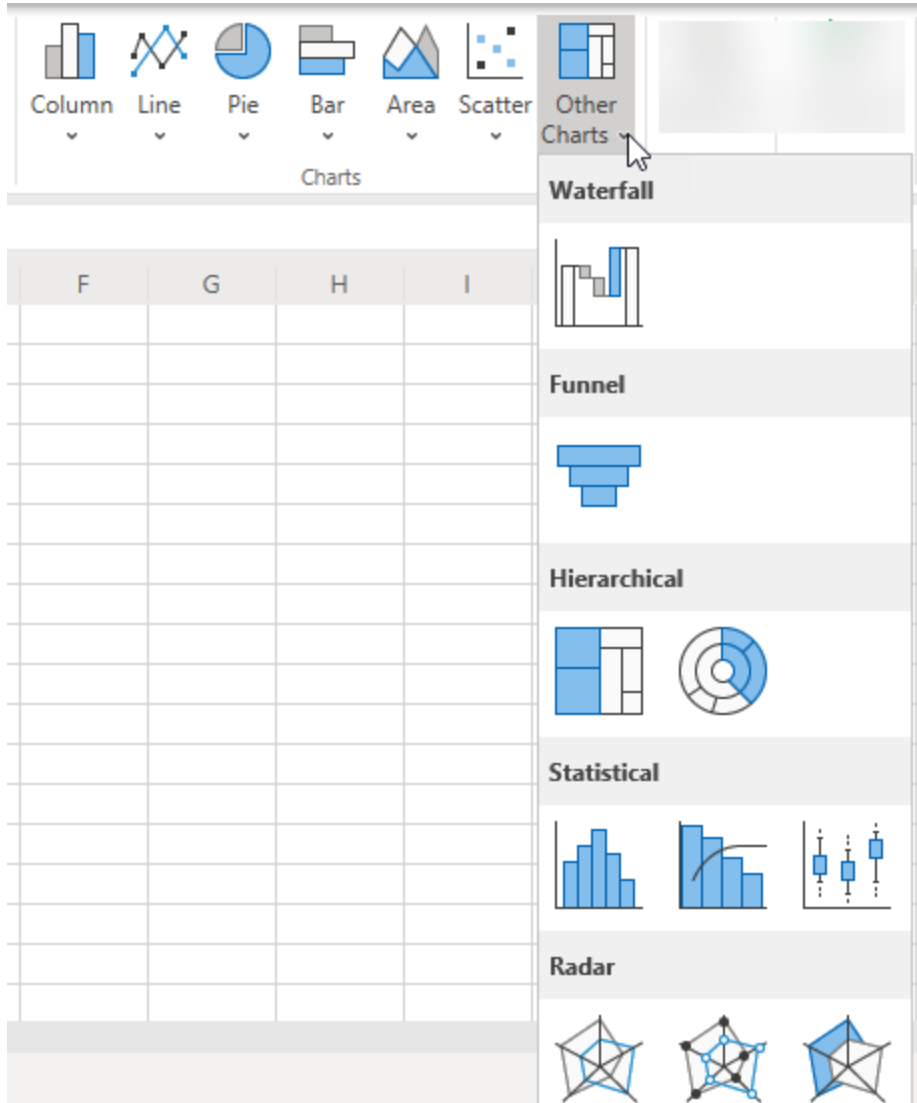
Below is a breakdown of each chart type that is available and what data each type is best suited to display:

- **Column**: Best suited to display data changes over time or to compare separate data points.

- **Line**: Typically used to display data changes over time.

- **Pie**: Used to compare different data points in relation to a total. For example, you could use this chart type to show the total expenses of a company broken down by department.

- **Bar**: Typically, this chart type is used to compare different data points. It is like the Column chart type, but instead has the X-axis as the vertical axis and the Y-axis as the horizontal axis.

- **Area**: This chart type is typically used to illustrate rates of change over a period, as well as include the total value in a trend.

- **X Y (Scatter)**: Used to illustrate values from a variety of different trends and their relationship to one another.

- **Radar**: This chart type is used to compare values from multiple data sets all on the same chart with each separate data (category) on a separate axis. Typically, this chart type is best suited to identify outliers and commonalities between data points.

- **Hierarchical / Treemap**: This chart type is designed to display hierarchical data through nested rectangles. Each branch of the tree is shown as a rectangle which is then tiled with smaller rectangles that show sub-branches.

- **Funnel**: Show progressively smaller stages in a process.

- **Statistical / Histogram**: A column chart that is designed to show frequency data.

- **Waterfall**: Sometimes referred to as a flying bricks chart or a Mario chart, this chart type represents data through a series of columns that are suspended in mid-air. These are typically used to understand how an initial value (e.g. sales revenue) is affected by positive or negative values (e.g. staff costs).

Chart Insertion Methods

When inserting a new chart into a worksheet, you should always have the dataset that you would like represented selected. If you select only one cell within the dataset in question, Excel will automatically try and guess the data range that you are trying to represent. While this is a good idea in theory, in practice, this feature does not always work as intended.

Additionally, when you are inserting charts, remember to include the row or column header when selecting the dataset. This will ensure that categories that you want plotted along the X axis of the chart are your column labels from the dataset and the data series are row labels. Once the data set is selected, including labels, you can then insert a chart using one of several options. Perhaps the most direct way is to use the commands inside the Charts group of the Insert tab; however, you can also use the Insert Chart dialog box, or insert the most recommended chart type for the selected data using keyboard shortcuts.

If you would like the most recommended chart type to be inserted onto the same worksheet, you press Alt + F1. If you want the default chart type to be inserted into a new worksheet, press F11.

Resizing and Moving the Chart

Once a chart has been added to a worksheet, you are able to resize and move the chart around as you see fit. To move a chart, click to select the chart in question and then drag it to its new destination. Release your mouse button to place it there:
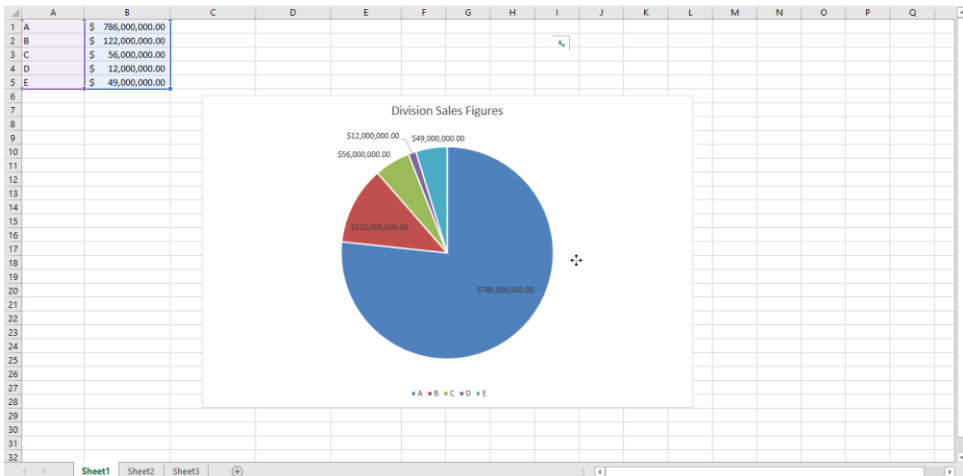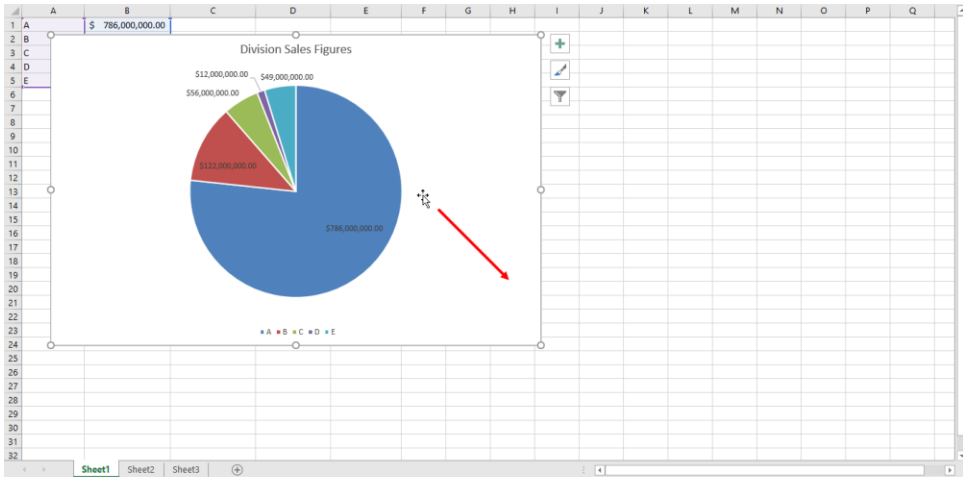
You can resize a chart using the resize handles that appear on each of its sides and corners while it is selected:
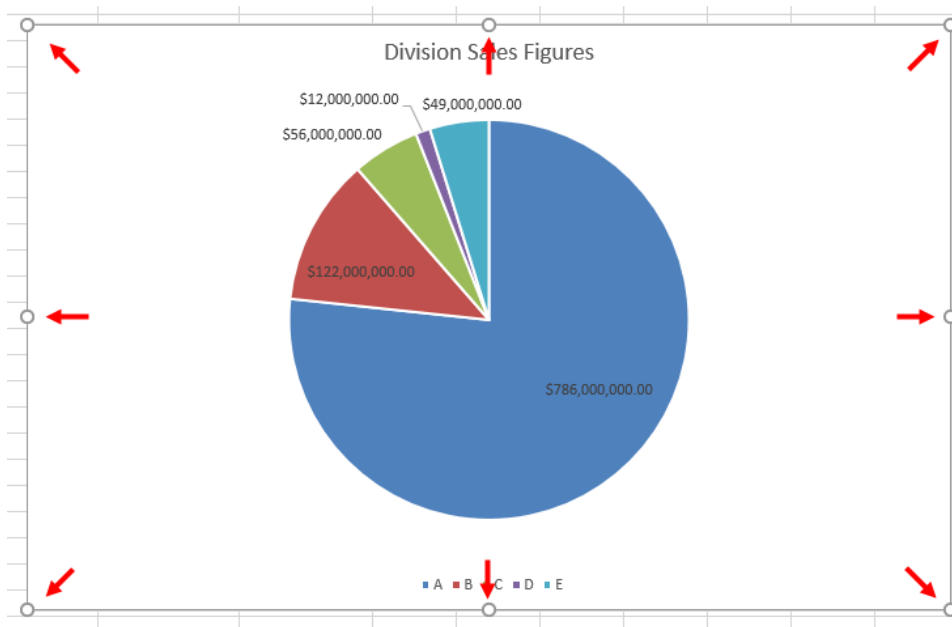
To use these handles, click and drag them in the direction in which you want to enlarge or compress the chart. Using the handles on the sides, you can modify the chart size in one direction (horizontal and vertical), while the corner resize handles allow you to resize the chart size in both directions at the same time.

Adding Additional Data

Once a chart has been created, the data that it represents does not have to be static. You can add or remove information from the data range and the chart will represent these changes instantaneously. To do this, first click to select the chart in question. While the chart is selected, you will see that the associated data range will appear outlined and shaded in:
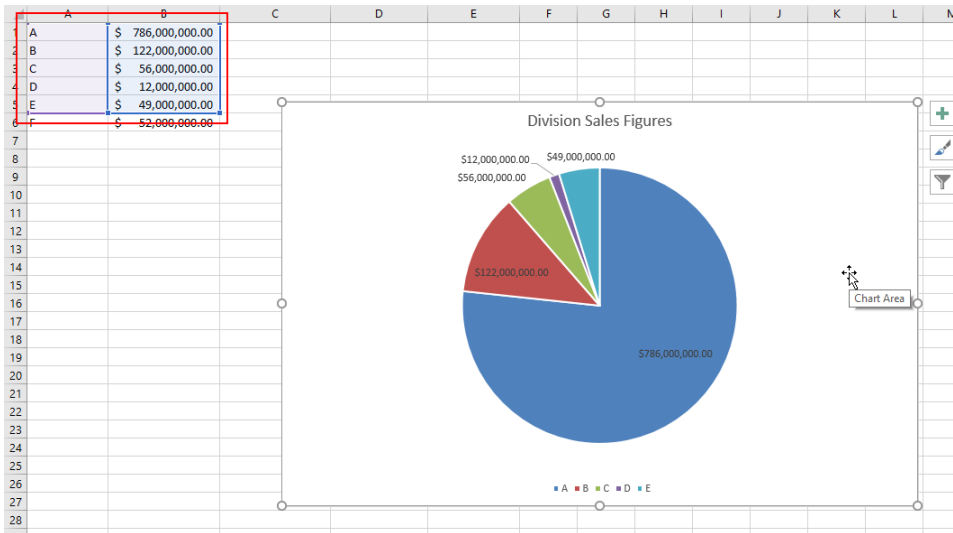
By clicking and dragging the resize handles for these outlines, you can choose which data you would like to include in the chart. For example, if you want to include the additional line of information shown in the example above, you click and drag the resize handle downwards:

Once the range area has been successfully resized, the new data will be immediately incorporated into the chart. In this case you can see that F is now represented:
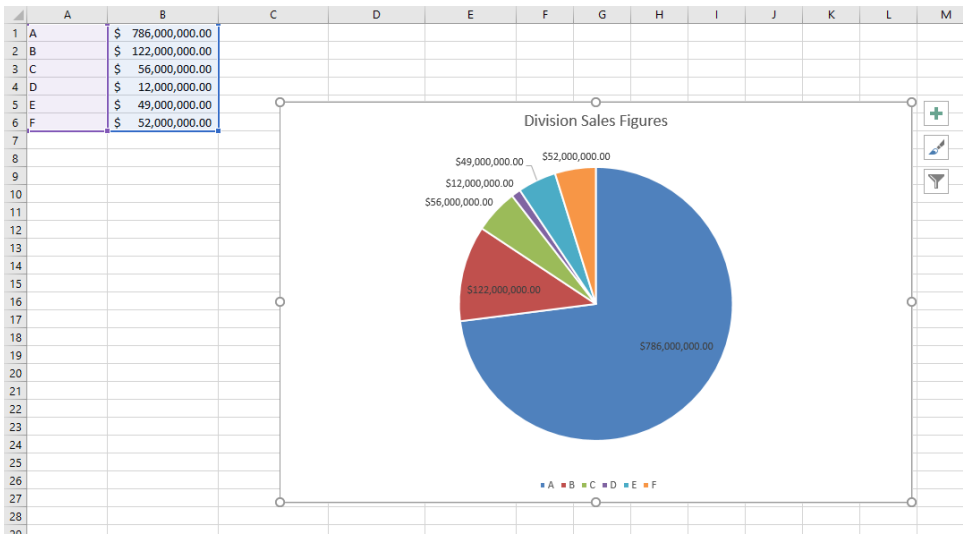
Activity 3-1: Creating Charts

In this activity, you will format header rows and a title in your worksheet.

You need to produce a chart that will easily demonstrate to your supervisor which salesperson made the most sales in week one.

1.   To begin, open Activity 3-1 from your Exercise Files folder:

2.   First, you need to select the dataset that you would like to work with.

3. Next, create a bar chart by going to the insert tab and selecting "Bar:"
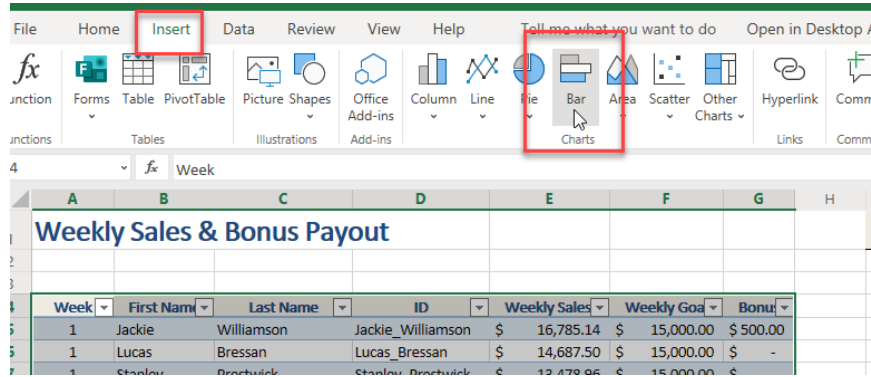
4. The new chart will now appear on the current worksheet, overlapping some of the data:
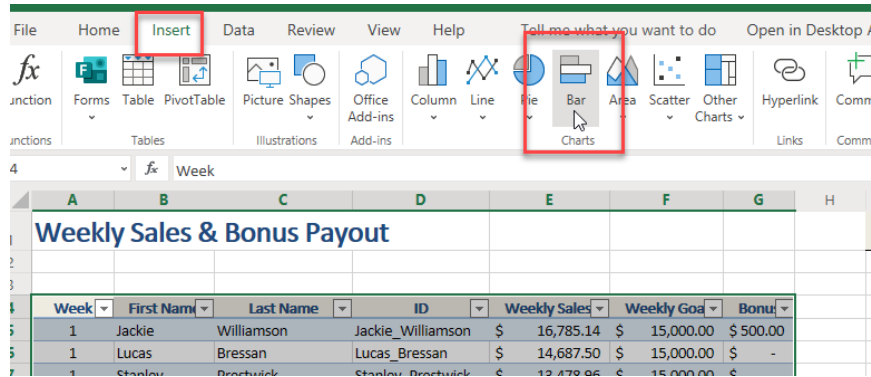
5. Click and drag this chart to a location on the worksheet where it is not overlapping anything:
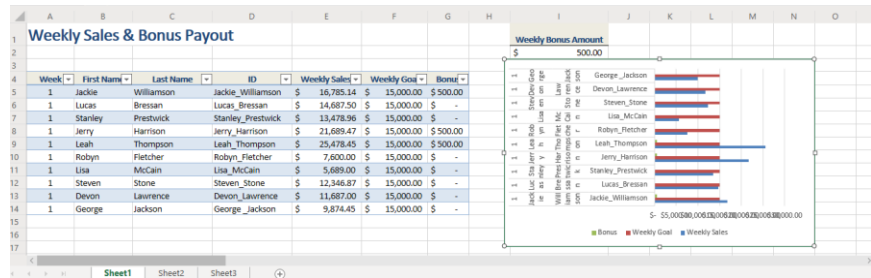
6.   Examine the new chart. You will quickly see that Thompson made the most sales in week one, with Harrison as the next runner up. McCain clearly has some work to do:
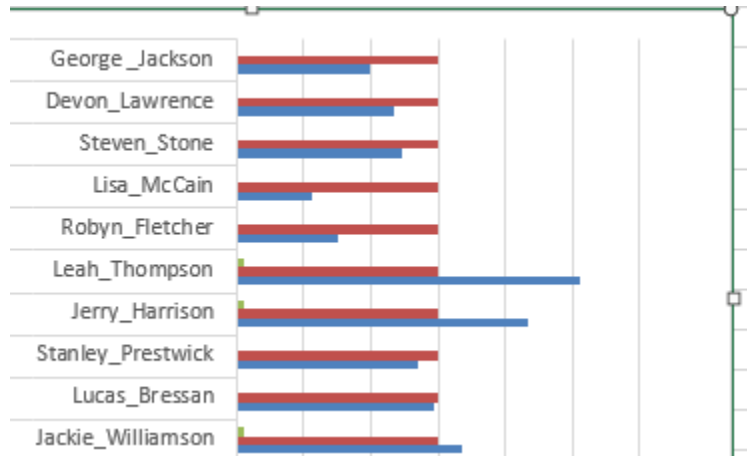
7.   Save your worksheet as 'Activity 3-1 Complete' and close Microsoft Excel.

TOPIC B: Modify and Format Charts

Charts can be added quickly and easily using the default chart configurations, but sometimes those configurations are not suitable. In such cases, you will need to know how to modify and format your chart to include data, adjust the size of the chart, and apply company branding.

Topic Objectives

In this session, you will learn:

- About modification vs. formatting

- About chart elements

- Guidelines for including chart elements

- About the Chart Tools

The Difference Between Modifying and Formatting

While modifying and formatting charts sound like the same thing, they are different in this context. When you choose to **modify** a chart, you are changing the various elements that are used to illustrate the data. For example, adding or removing chart elements or changing the chart type would be considering modifying a chart.

Formatting is the process of altering the overall appearance of the chart. This includes changing the chart's colors, fonts, and/or size. For example, if you need to change a chart to incorporate your organization's branding rules, you are formatting it.

Chart Elements

Chart elements are the individual pieces of the chart that come together to create it. There will always be at least one chart element present in a chart, but the combination of chart elements largely depends on the chart type. Here is a sample column chart:
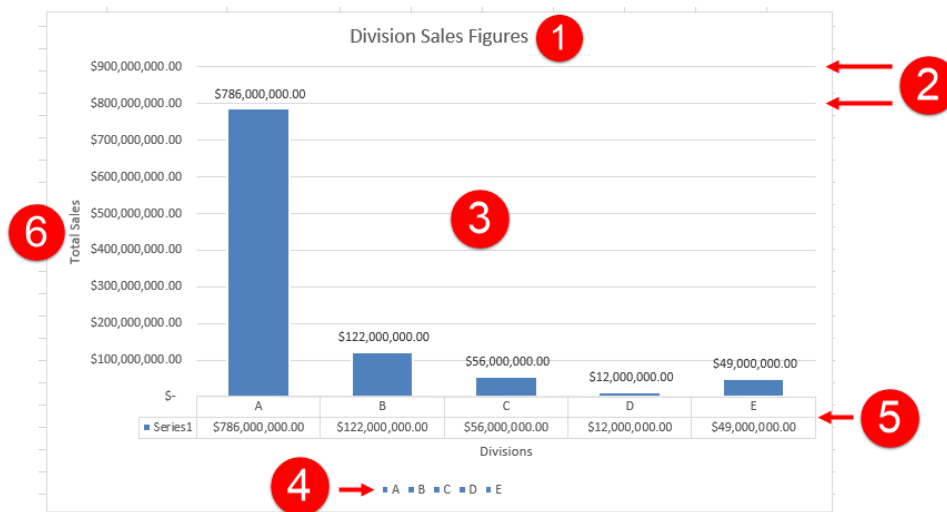
The above chart contains six chart elements: Chart **Title (1)**, **Gridlines (2)**, **Data series (3)**, **Legend (4)**, **Data table (5)**, and **Axis Titles (6)**.

Minimize Chart Elements

Modifying charts can have a significant impact on how and what information is conveyed. Due to this fact, it is best to keep your charts as simple as possible. This will allow the data to speak for itself without cluttering the chart with information you are trying to simplify in the first place.

However, there are some instances where chart elements can help add meaning and context to the information being displayed.

The Chart Tools

When a chart is selected on the workspace, the Chart Tools contextual tab set will become available on the ribbon. This contextual tab set contains four option categories: 1. Data, 2. Change Chart Type (covered in Topic A), 3. Labels and 4. Axes.
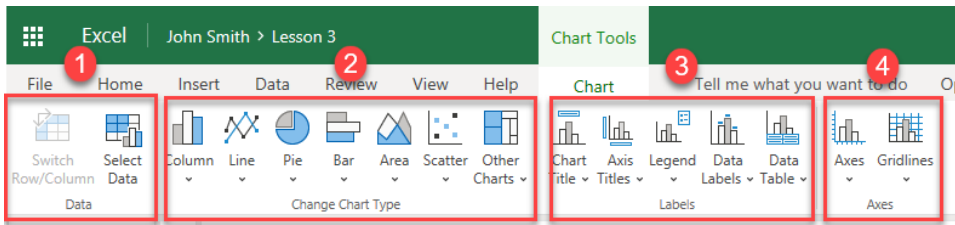
Modifying Data in a Chart (1)
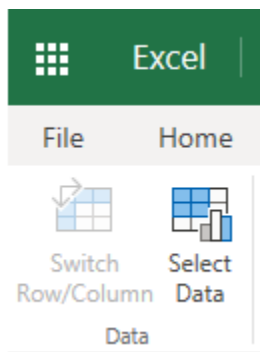
Switch Row / Column – Data being charted on the X axis will move to the Y axis and vice versa.

Select Data – Change the data range included in the chart.

Modifying Labels (3)

When working with charts, labels are important to understand the data the chart represents.
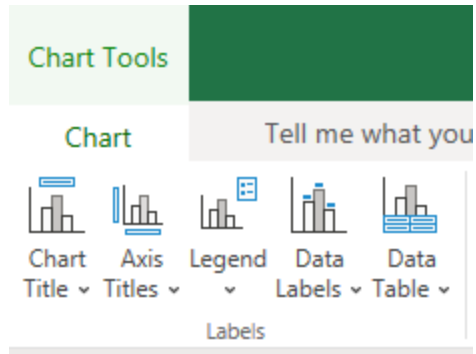
Chart Title – Describes the entire chart. Excel 365 allows you four options to edit the Chart Title and can be accessed by the following:

Chart Tools – Label → Chart Title (click small arrow) → [Position]:
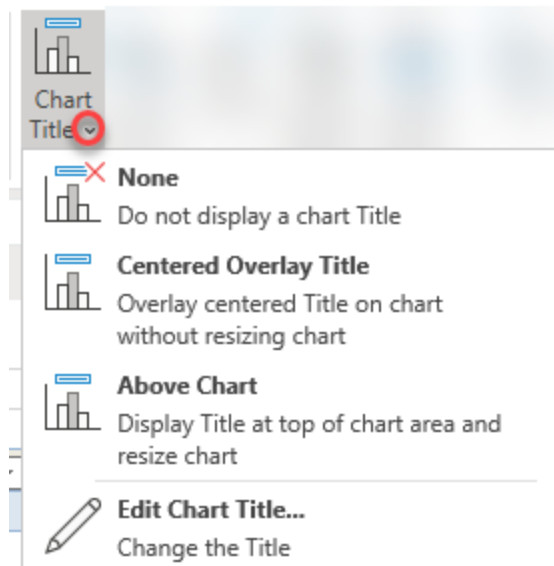
Axis Title – This title describes a category of data included in the chart. Excel 365 allows you to change the direction and position of the Axis Title.

Chart Tools – Label → Axis Title (click small arrow) → Select Horizontal or Vertical → [Position]:
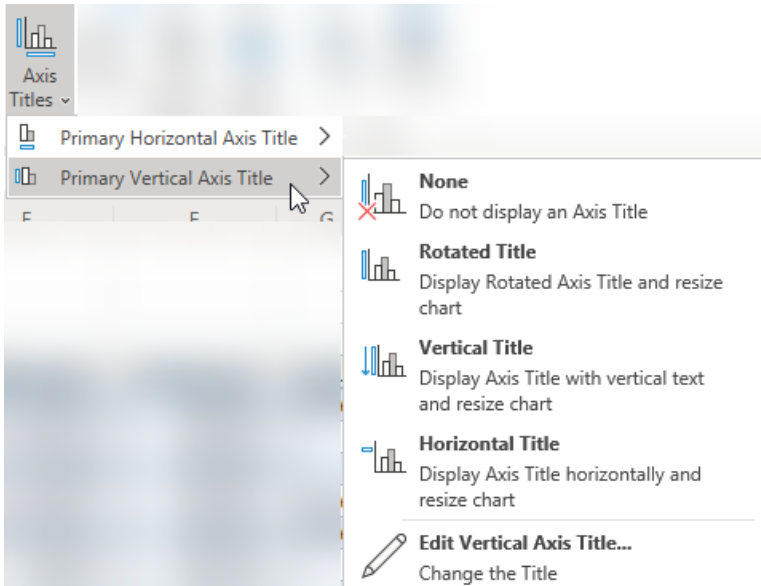
Legend – While legends are displayed by default, Excel 365 allows you to remove it or reposition the legend using the following:

Chart Tools – Label → Legend (click small arrow) → [Position]:
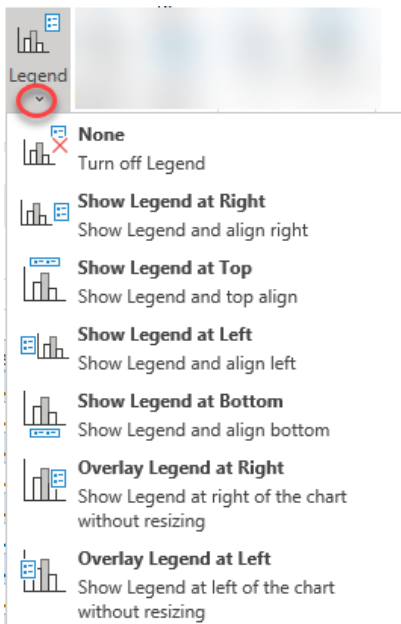
Data Labels – Allows you to provide a label to a value on a worksheet, Excel 365 allows you to position the data label in four different positions:

Chart Tools – Label → Data Label (click small arrow) → [Position]:
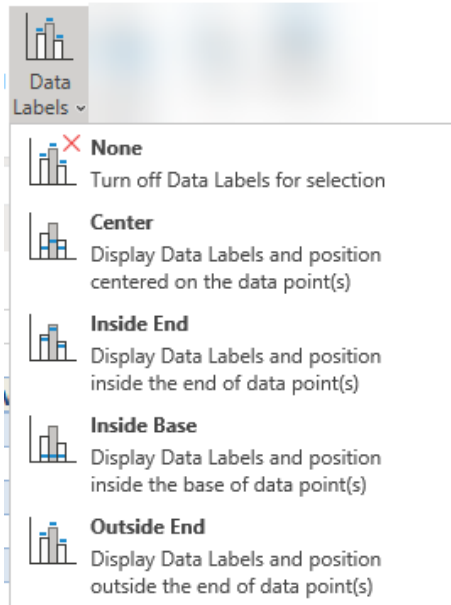
Data Table - Allows you to display the information from your chart in a table, Excel 365 allows you three different options, None, Show in Data Table or with Legend:

 Chart Tools – Label → Data Table (click small arrow) → [Position]:
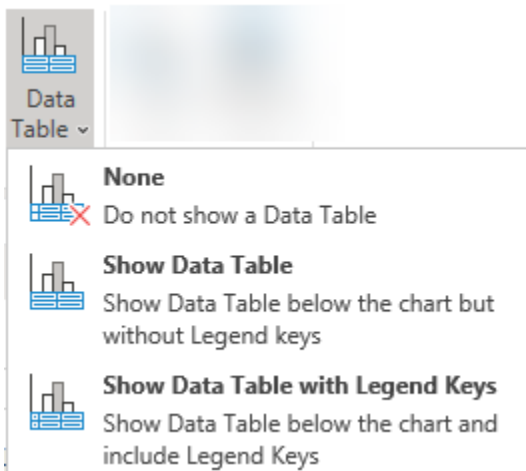
Modifying Axes Information (4)

When working with charts, Axes information is important in order to understand the data represented by the chart.

Axes – There are two Axes, Horizontal (usually nonnumeric data) and Vertical (usually numeric data).

Primary Horizontal Axis options include showing labeled information left to right; on display; or information right to left:
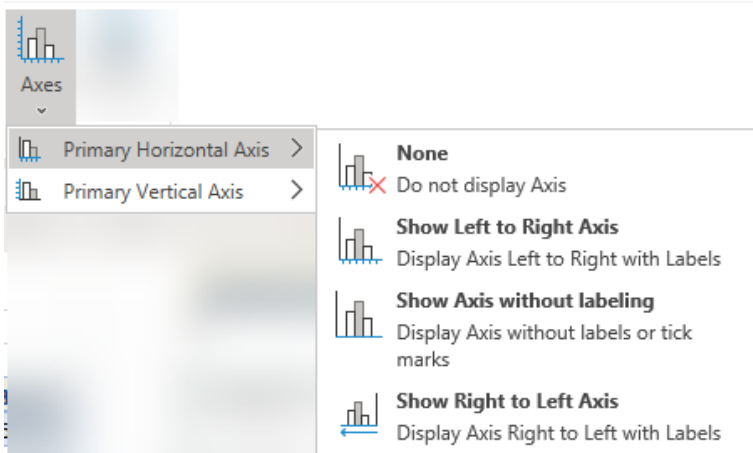
Primary Vertical Axis options includes numbering scales that best represent your data.
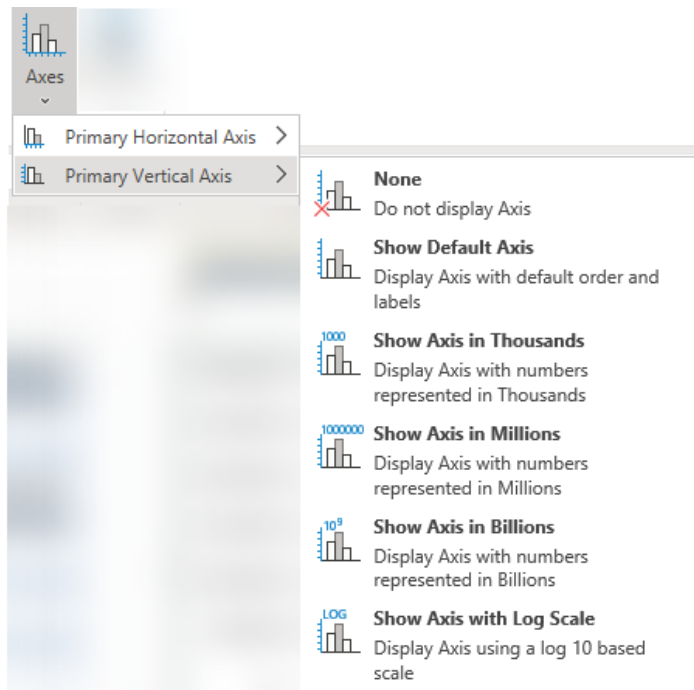
Gridlines – Gridlines can help make your chart easy to read by providing background lines behind the data. Either horizontal / vertical grid lines can be turned on. Excel 365 also allows choice to display all grid lines or only major ones or minor ones.
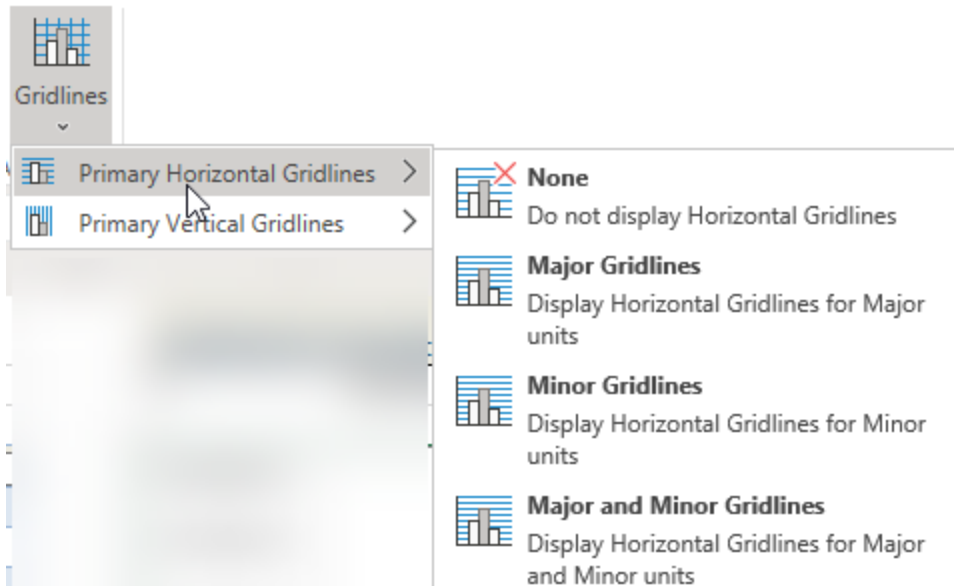
Activity 3-2: Modifying and Formatting Charts

You have created a chart that illustrates the weekly sales made by your sales staff. You would like to make the presentation of the data clearer.

1.   To begin, open Activity 3-2 from your Exercise Files folder:
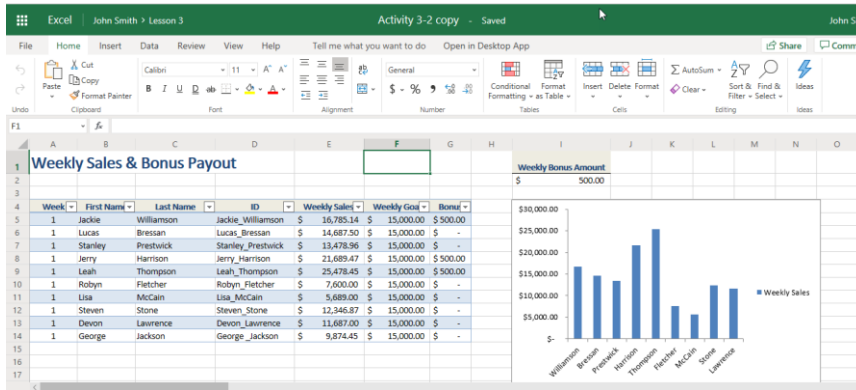
2.   Click to select the chart on the current worksheet. You will see the Chart Tools contextual tab set appear on the ribbon:
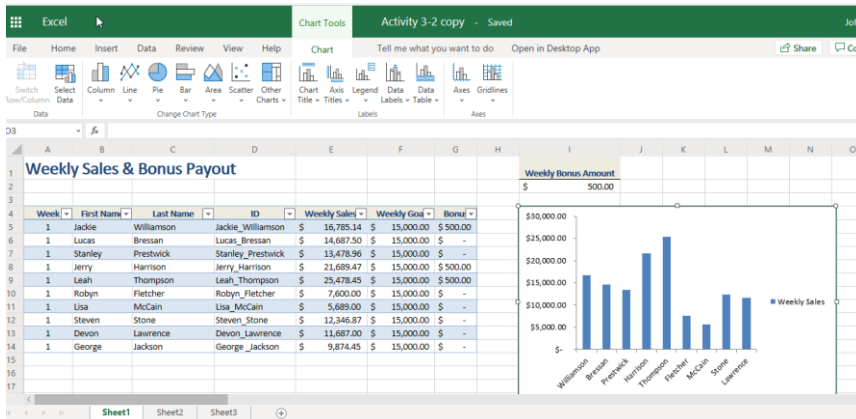
3.   First, you should add a title to this chart. Click Chart Tools – Design → Add Chart Element → Chart Title → Above Chart:
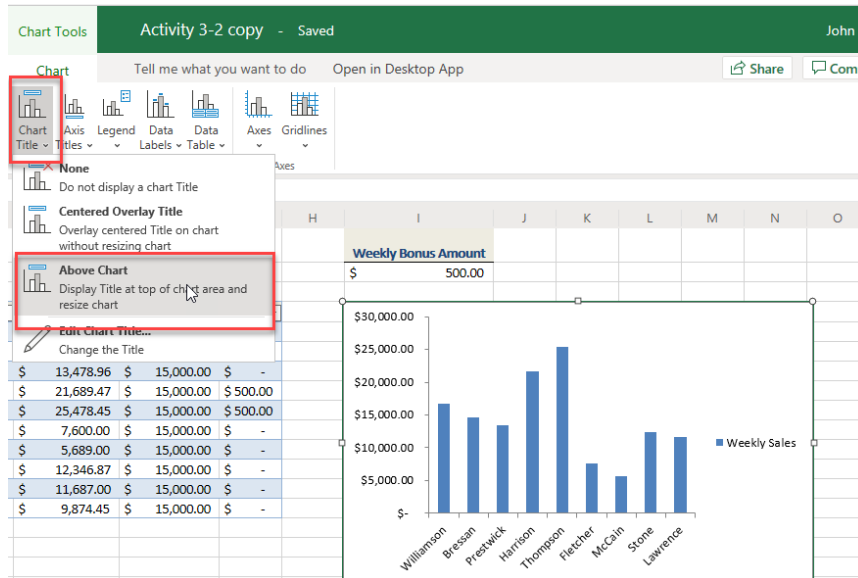
4.   The chart title will now be displayed above the data series on the chart:
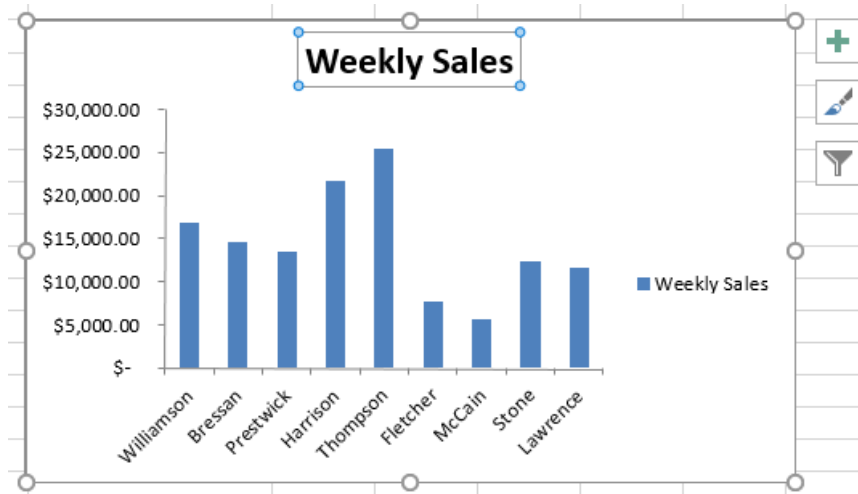
5. Next, you should add major horizontal gridlines to make this chart a little easier to read.
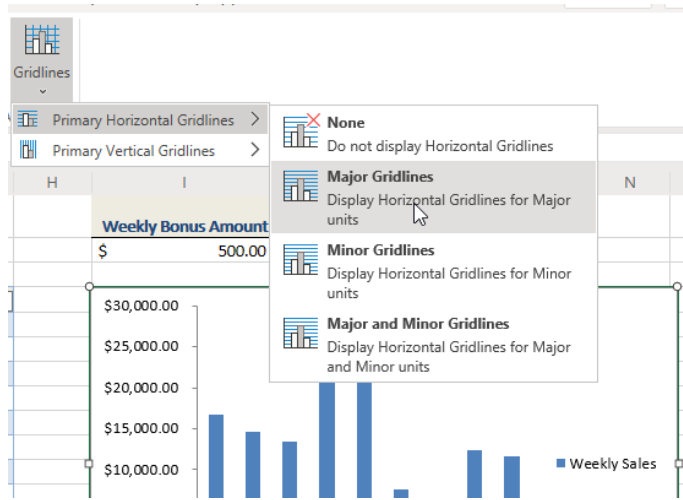
6. Major gridlines will now be displayed on the chart:
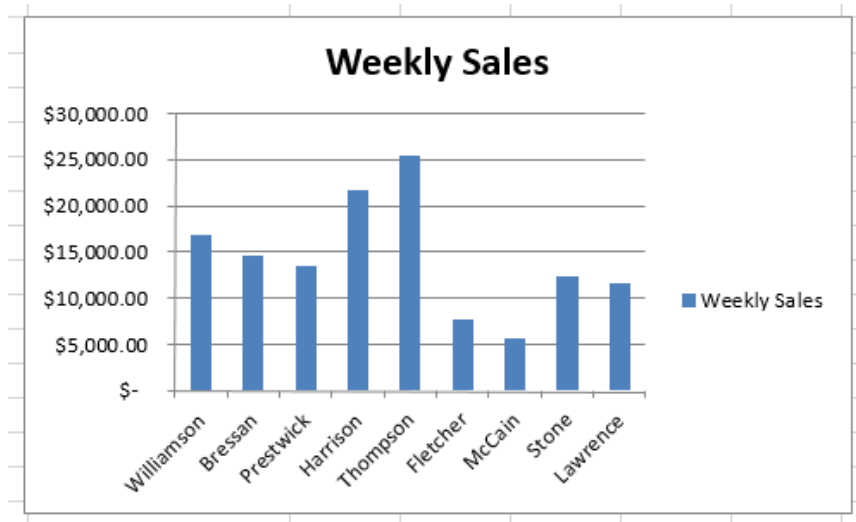
7.   Finally, you might as well remove the legend as what this data represents is evident. Click Chart Tools → Legend → None:
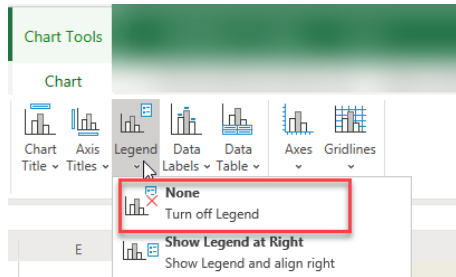
8.   Save your work as 'Activity 3-2 Complete' and close Microsoft Excel.

Summary

This lesson taught you how to insert charts into worksheets as well as the best way to format charts to meet the specific needs of you and your audience. Additionally, you learned about the wide variety of charts that are available to you depending upon the data that you are working with. You should now feel comfortable modifying as well as formatting existing charts.

LESSON 4:
ENHANCING WORKBOOKS

Lesson Objectives

In this lesson you will learn how to:

- Customize workbooks

- Prepare a workbook for audiences

TOPIC A: Customize Workbooks

Your workbooks can be customized in several different ways. In this session, we will focus on customization through the addition of comments, hyperlinks, and pictures.

Topic Objectives

In this session, you will learn:

- About comments

- About hyperlinks

- About pictures

Comments

Notes can be added to any worksheet by inserting **comments**. Typically, they are used to provide additional context to items within a worksheet to help guide other users, but they can be used for any topic.

To add a comment, first select the cell that you would like the comment to be added to. Next, click Review → New Comment:
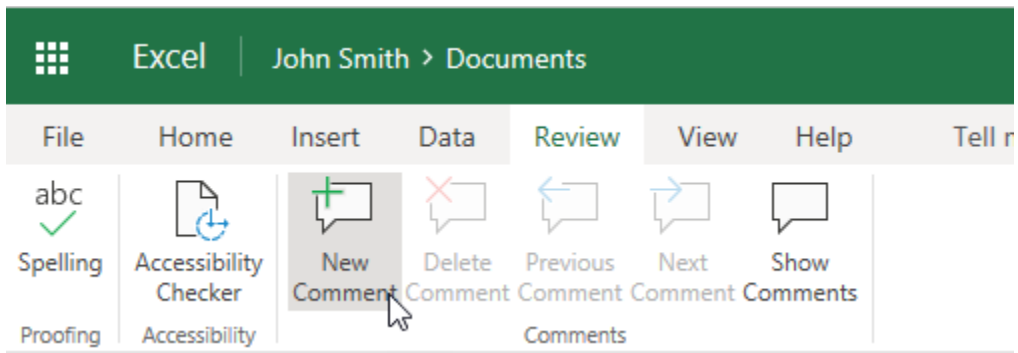
This action will create a new comment and a red comment indicator will appear in the upper right-hand corner of the currently selected cell. The comment will be labeled with the current user's name, but this can be changed by replacing that text as needed. To add text to the comment, type inside the provided text area:

Once you are done, click anywhere outside of the comment text area to hide it; however, the red comment indicator will remain visible:

To view the comment again, click to select the cell in question or simply hover your cursor over it. To delete a comment, click to select the cell in which the comment has been placed and click Review → Delete.

Hyperlinks

Hyperlinks are a mainstay in the computing world. They enable you to navigate around your computer, browse the internet, and jump to different cells within the same workbook. Excel lets you use this handy feature for breaking up long workbooks, directing people to a web page, providing contact information, and much more.

To create a hyperlink, first click to select the cell where you want the hyperlink to be created. Next, click Insert → Hyperlink:
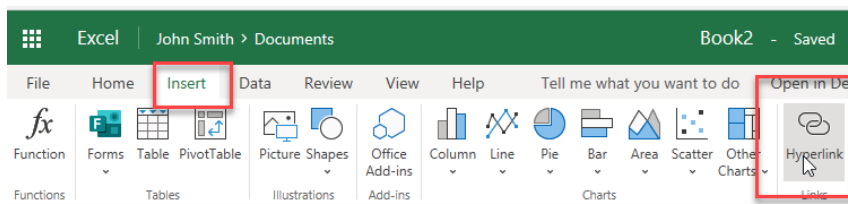
This action will display the Insert Hyperlink dialog box.
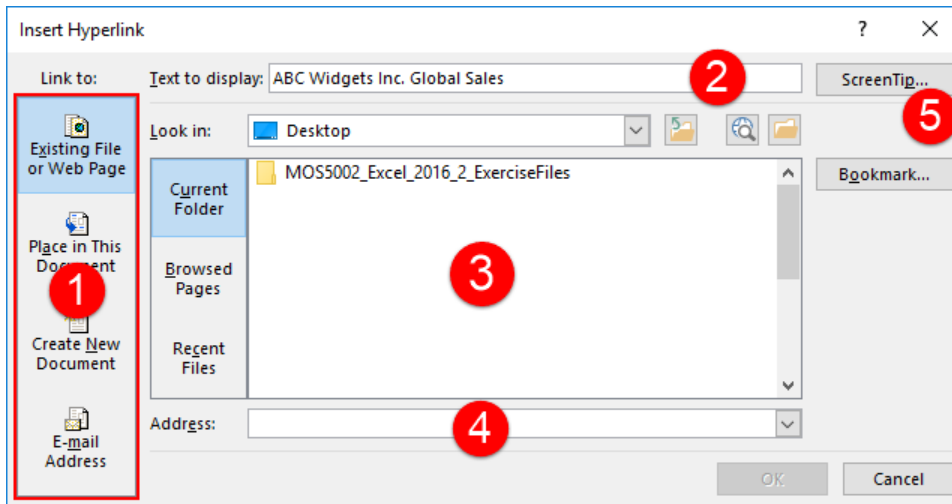
The left-hand side of the dialog box allows you to **choose the type of link (1)** that you want to create. By default, the "Existing File or Web Page" option will be selected. (It will likely be the type of link you use most often.)

With this option, you will see the settings shown above. At the top of the dialog box, you can set the **text to display (2)**. This is the text that will turn blue and will contain the actual link. (By default, any text in the cell that you selected will appear in this field, but you can modify it if you wish.)

Below this field, you can choose the **file (3)** or **website (4)** that you want to link to. You can also set up a **ScreenTip (5)** for the link.

When you are ready, click "OK" to save your changes, or click "Cancel" to discard them. Note that the OK button will not be active until both the "Text to display" and Address fields are filled in.

Once the hyperlink has been inserted, you will see that it appears in blue and underlined. Clicking on the link will open it, but clicking and holding on the link will select the cell that contains it:

	A	B	C
1			
2	ABC Widgets Inc. Global Sales		
3		Global	Outside of USA
4	Q1	$ 600,000,000.00	65%
5	Q2	$ 122,000,000.00	88%
6	Q3	$ 56,000,000.00	74%
7	Q4	$ 22,000,000.00	46%

To remove a link, right-click the hyperlink in question and then click "Remove Hyperlink" in the context menu.

Pictures

To add some design elements to your workbooks, you have the option to add pictures. These pictures will appear entirely in the background of a worksheet without interfering with the contents of the cells.

To insert a background picture, click Insert → Picture:
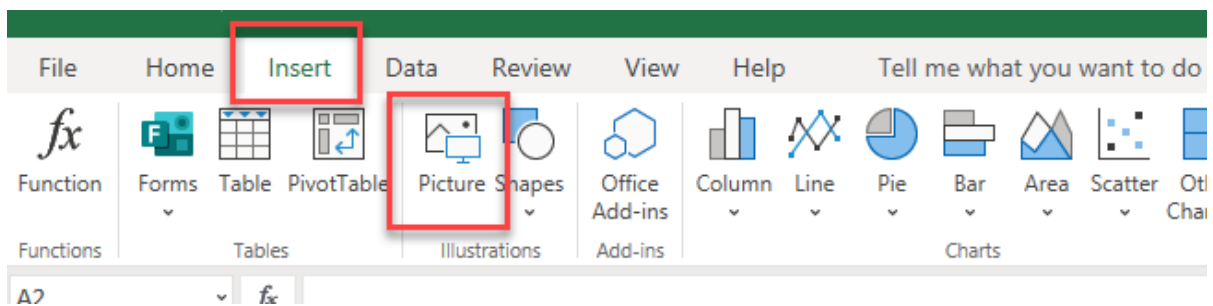
This action will display the Insert Pictures dialog box.
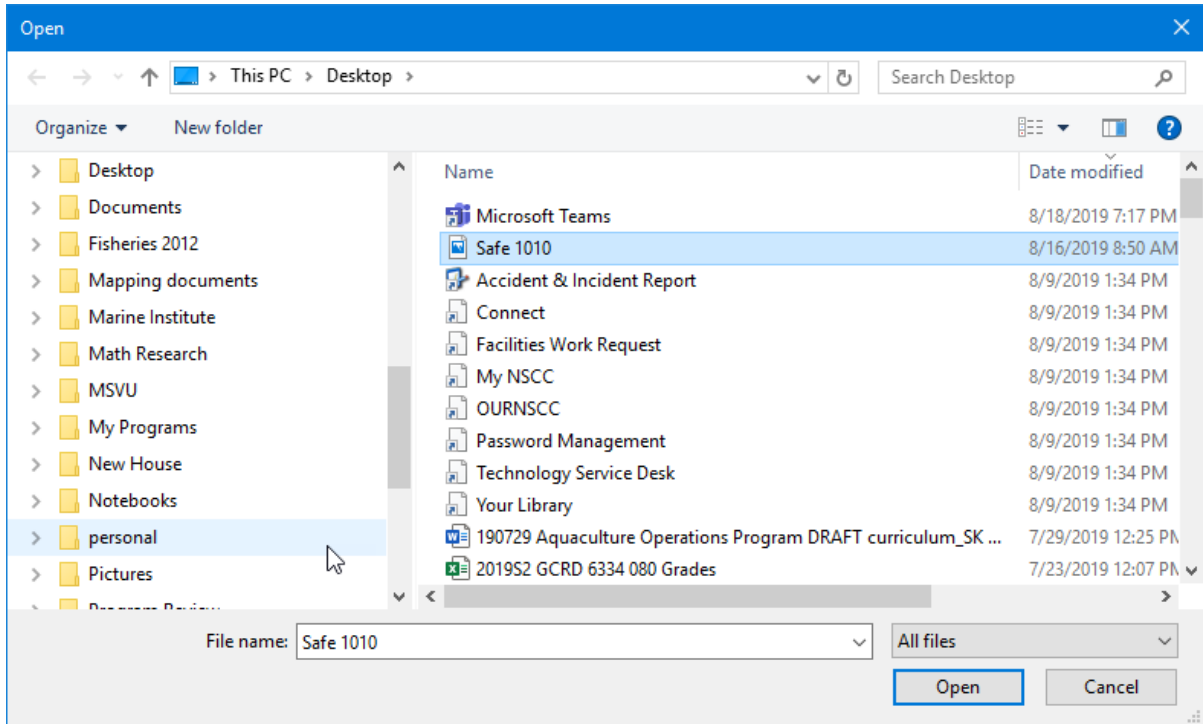
Once you find and select a picture, it will be added to the current worksheet. Note that if it does not span the entire dimensions of the worksheet, it will tile itself automatically:
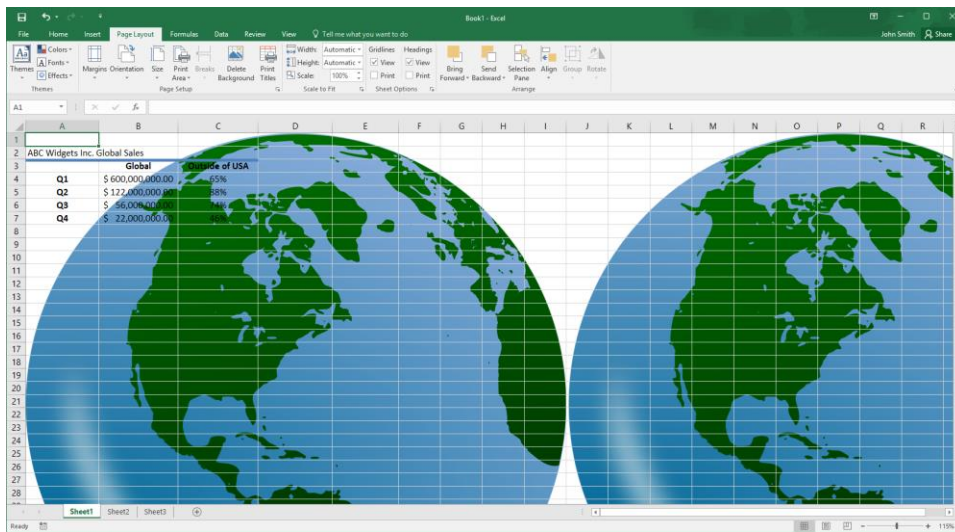
Activity 4-1: Customizing Workbooks

You would like to customize a workbook that you have been working with, using some of the customization options that you learned about in this session.

1. To begin, open Activity 4-1 from your Exercise Files folder:

2. First, you would like to change the contents of cell A2 into a hyperlink. Click to select this cell and then click Insert → Hyperlink:

3.   The Insert Hyperlink dialog box will now be displayed. Ensure that the Existing File or Web Page category is selected and then type "http://www.example.org" into the Address text box. Click "OK:"
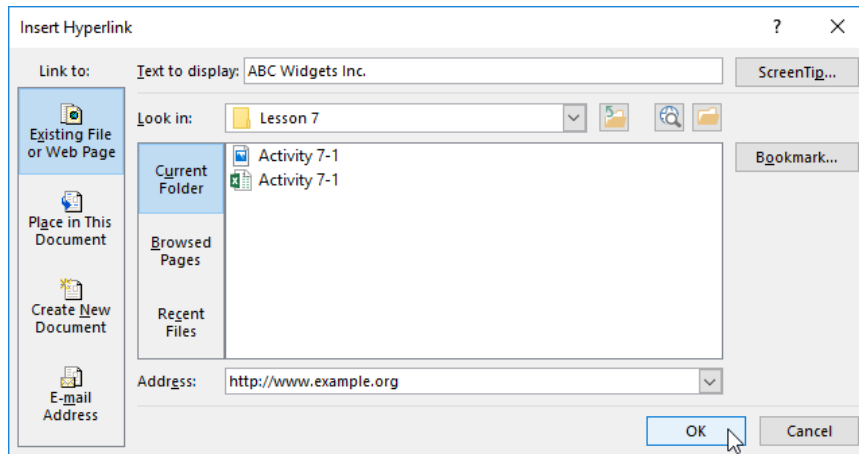
4.   With the new link created, test it out by clicking on it once:

5. Your default browser will open displaying the website that the hyperlink pointed to:
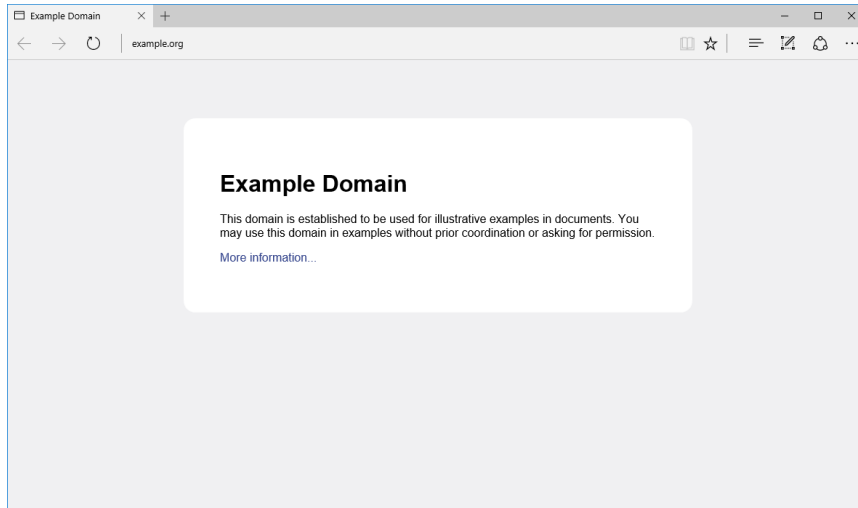
Close the browser window.

6. Save the current workbook as 'Activity 4-1 Complete' to finish this exercise.

TOPIC B: Preparing a Workbook for Multiple Audiences

One thing to keep in mind when working and managing workbooks created by Excel 365 is that multiple audiences from other regions of the world may be required to use and understand them. For this reason, it is important to ensure that when required, your workbooks are suitable for multiple audiences.

Topic Objectives

In this session, you will learn:

- How to modify worksheets using the accessibility checker

- How to manage fonts

- How to add alternative text to objects

Adding Alternative Text to Objects

Alternative text is an important step in making documents accessible. To add alternative text to any object, right-click that object and click the appropriate Format command. Here, we are working with a chart, so the command is Format Chart Area:
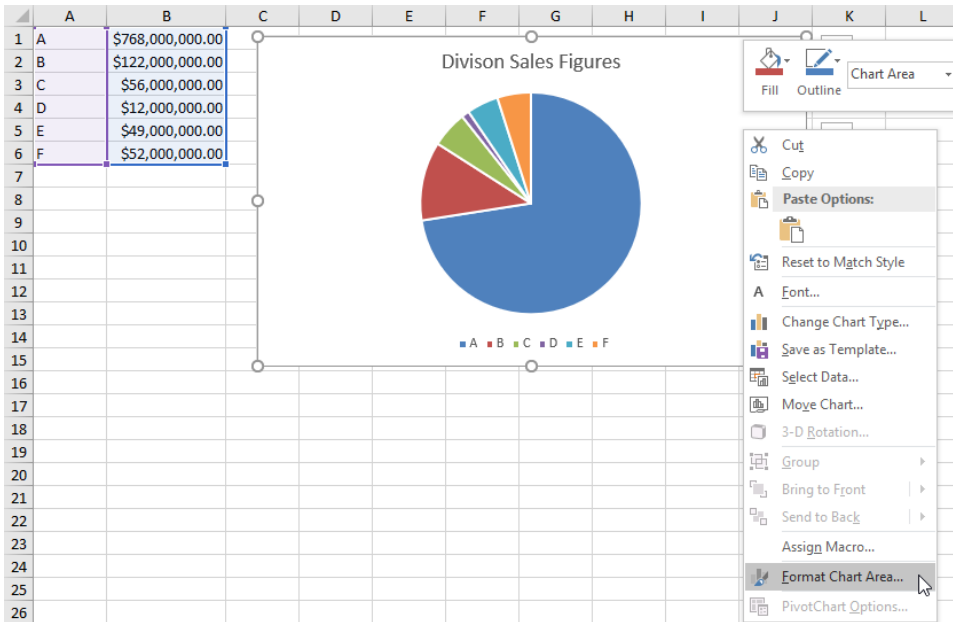
The related Format task pane will open. In this task pane, you should see a Size & Properties category. Click it:
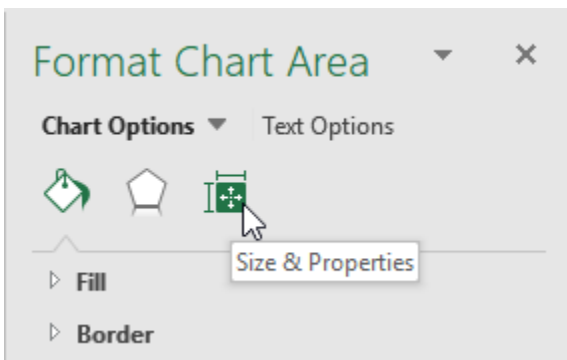
Next, click the Alt Text sub-category:
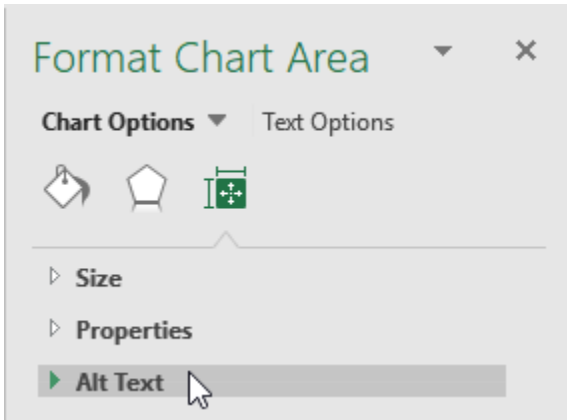
Here, you can enter a title and description for the object:
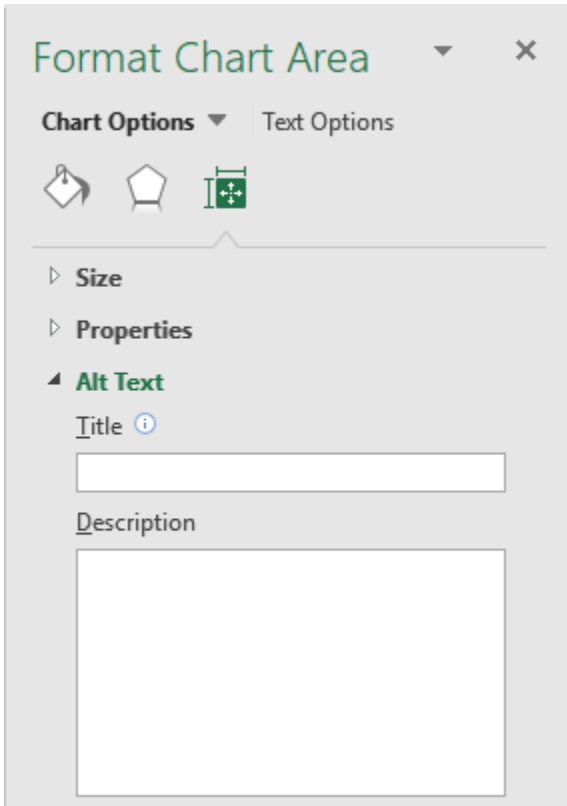
Modifying Worksheets Using the Accessibility Checker

The Accessibility Checker is designed to inspect your workbook for issues that might affect people who use screen readers. To open this tool, click Review → Accessibility Checker:
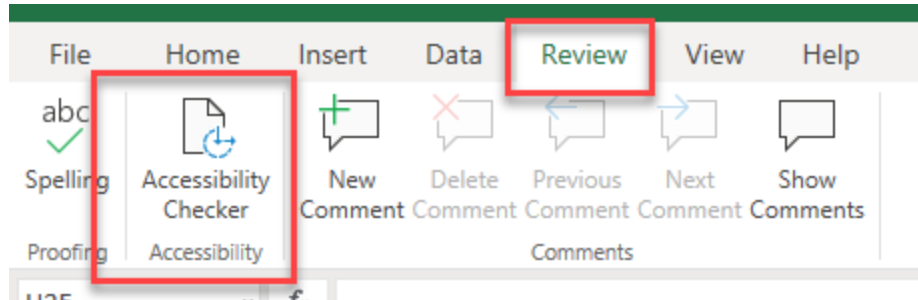
This command will open the Accessibility Checker pane on the right-hand side of the Excel window and list all the errors and warnings related to accessibility:

To view the details of an error or warning, simply select one from the list. Excel provides a brief explanation of why the issue appeared and how to fix it in the Additional Information area that is shown at the bottom of the pane:
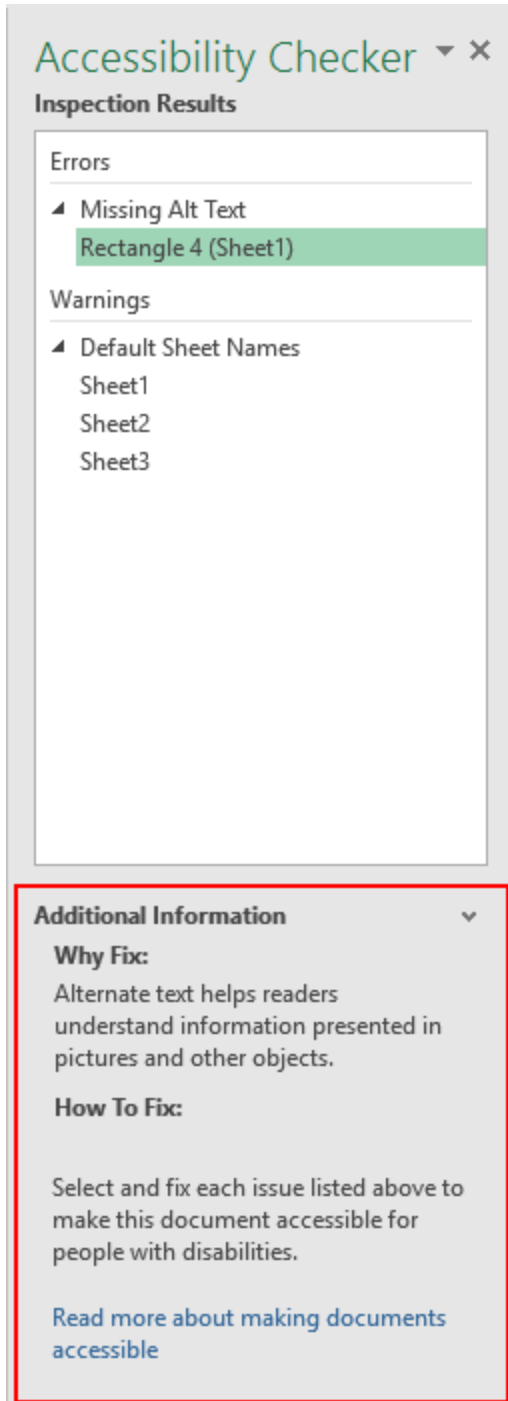
Managing Fonts

Body text and heading text that you add to Excel uses a specified font that you can customize. To do this, first click the Home tab and, then the Font dropdown:
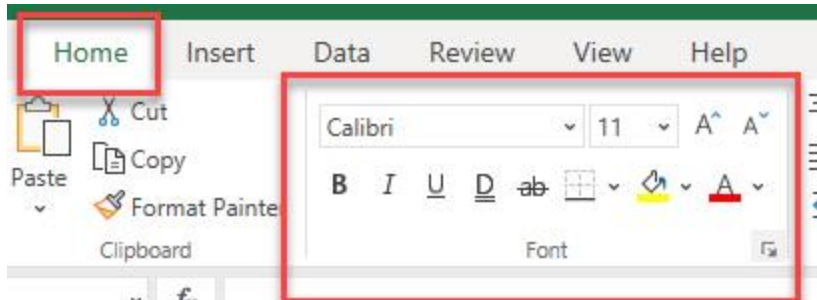
This action will open the Format Cells dialog box. By scrolling to the top of the Font list box, you will see both the headings and body font listings:
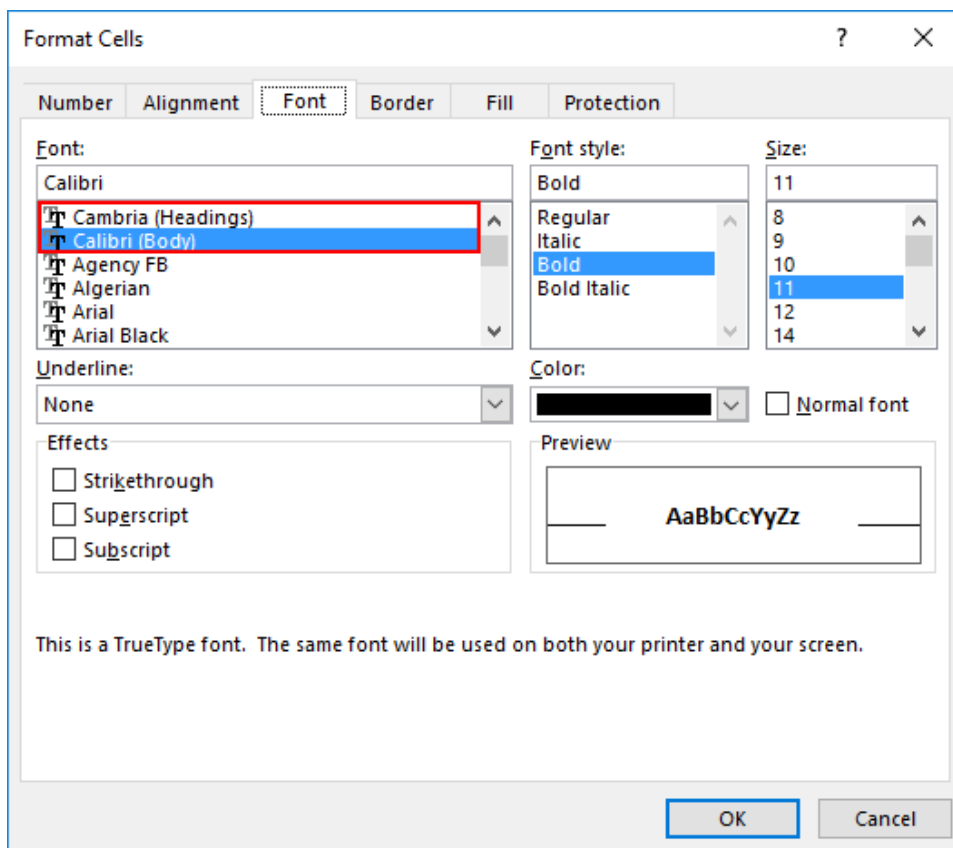
You can change how these basic fonts appear by selecting either of them and then choosing a font style, size, color, and font effect using the controls found on this tab:
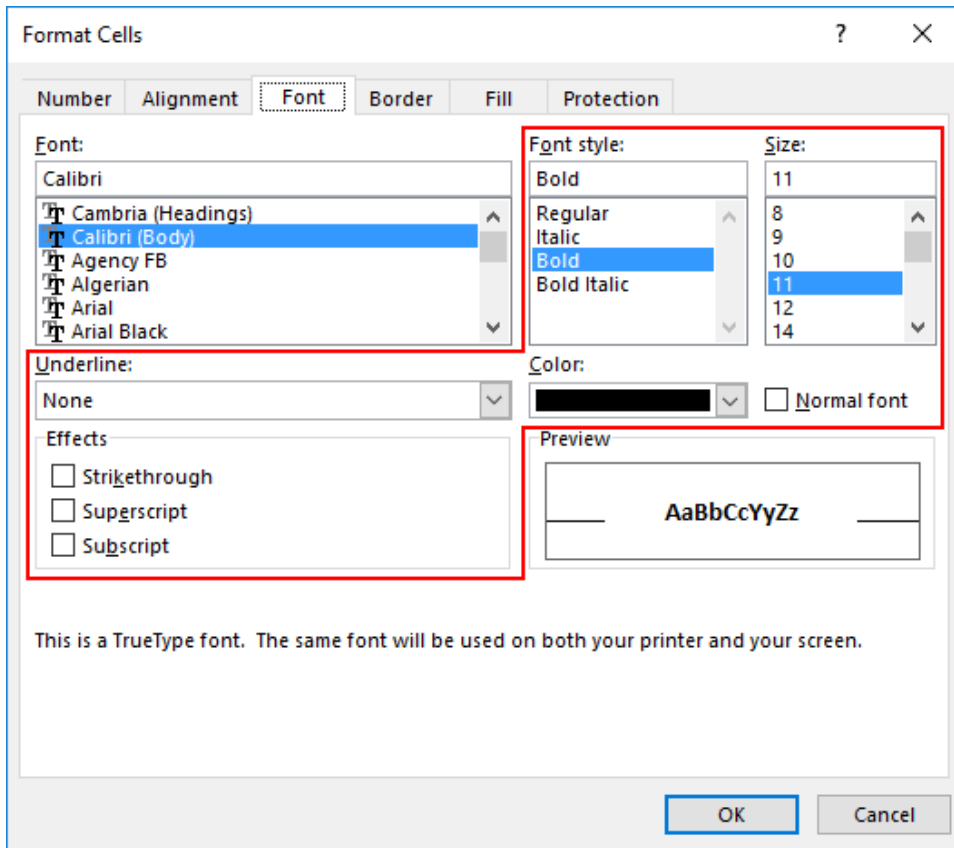
Activity 4-2: Preparing a Workbook for Multiple Audiences

The workbook that you have been working on needs to be checked by the Accessibility Checker for any errors, and you need to change every instance of the dollar symbol to the English pound symbol.

1. To begin, open Activity 4-2 from your Exercise Files folder:
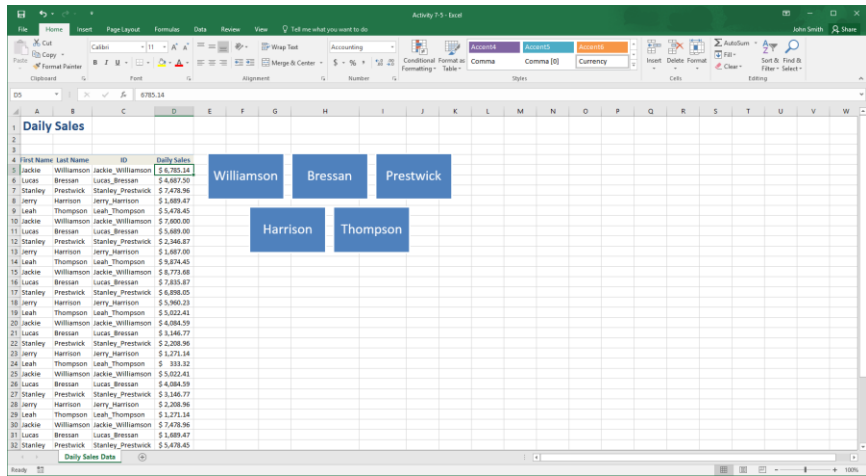
2. Use your cursor to select cells D:5 to D40:
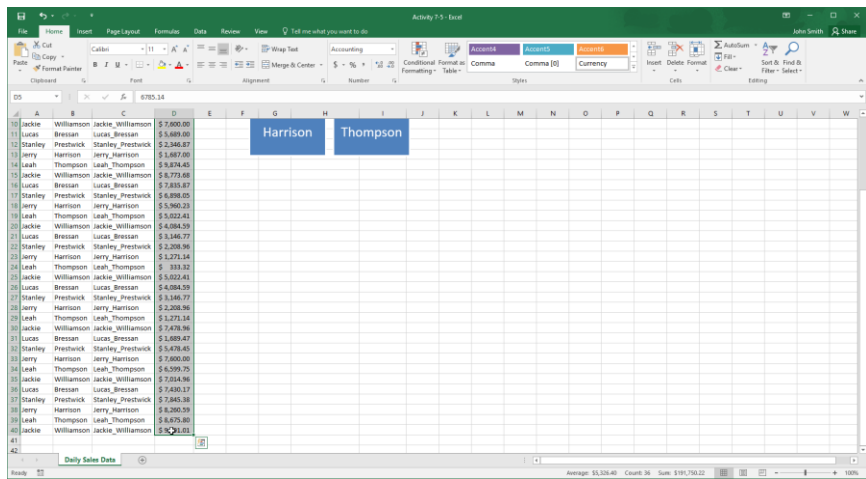
3.   Next, click the General button in the lower right-hand corner of the Number group on the Home tab:
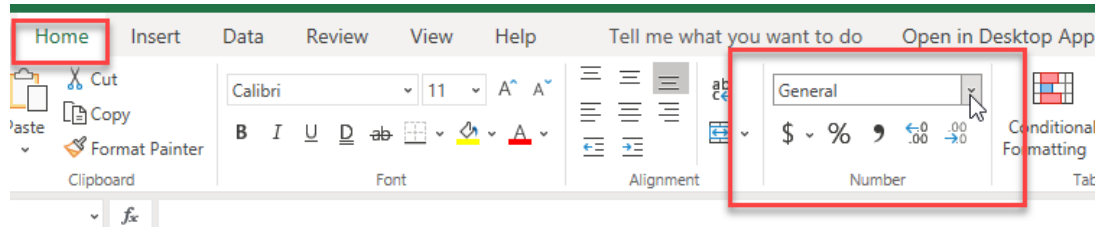
4.   The dialog box will now be displayed. Ensure that the Accounting category is selected from the Category list on the left:
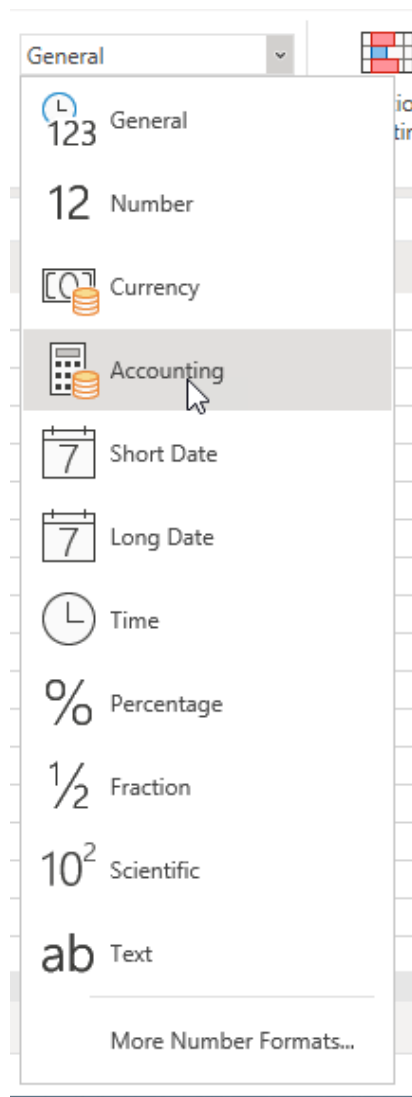
5. Next, click the Symbol drop-down menu and click the English (United Kingdom) option:
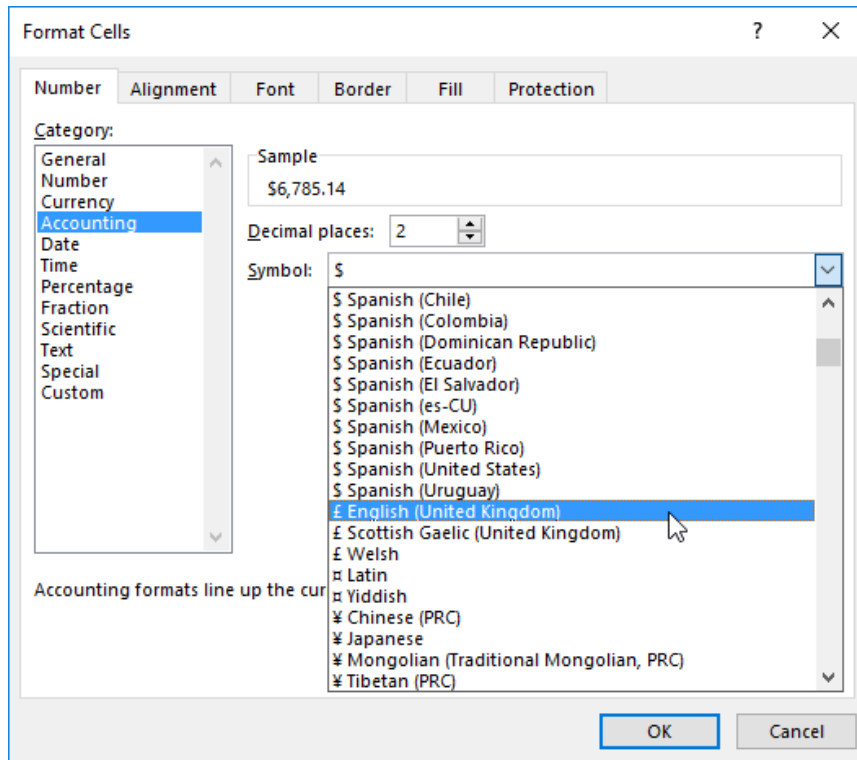
6. With the new currency symbol selected, click "OK" to apply your changes:
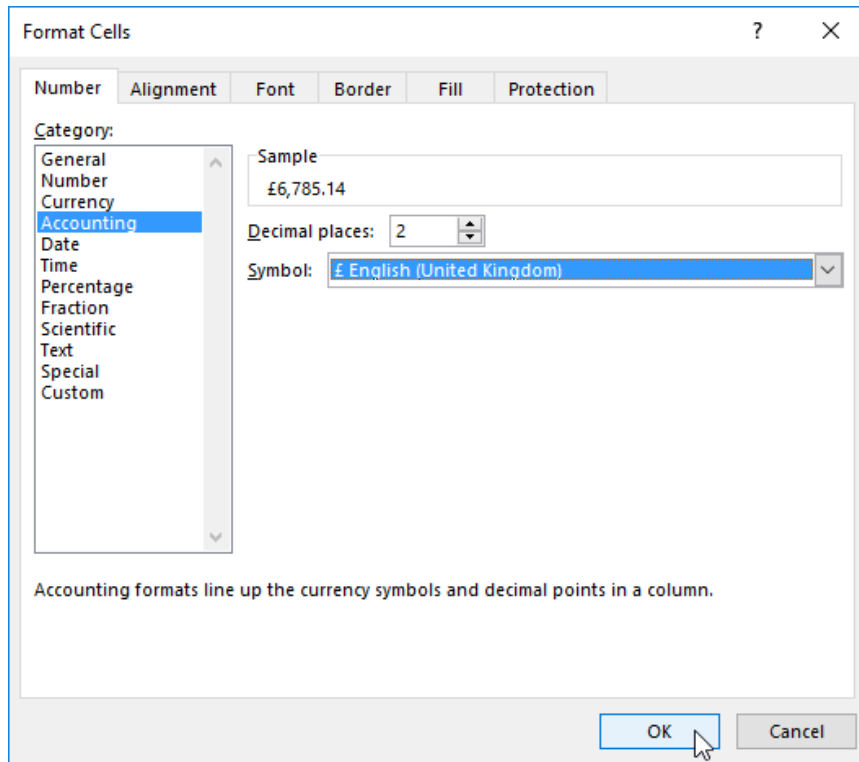
7. Back at the worksheet, you will see that the new currency symbol has replaced the dollar sign that was seen in the previously selected cells:

8. Now you need to run the Accessibility Checker. Review → Accessibility Checker:
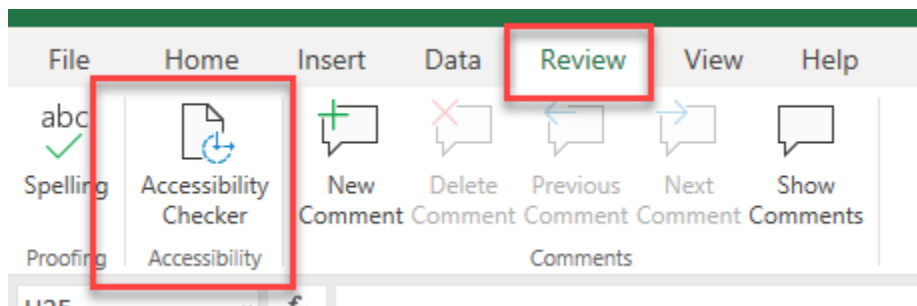
9. Returning to the worksheet, the Accessibility Checker pane will be displayed on the right hand-side of the Excel window. Listed inside of this pane will be any issues identified by the checker. In this case you can see that only one such issue has been found:
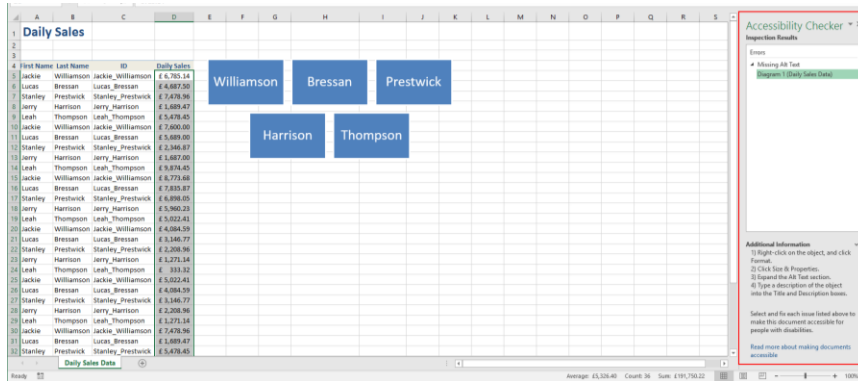
10. Click to select the issue that is listed, and you will see more information about the problem and the problem element will also be selected on the worksheet. In this case, the problem is with the SmartArt graphic. Review the How to Fix information lower in this pane and use those instructions to add "Employees" as alternate text to this graphic:
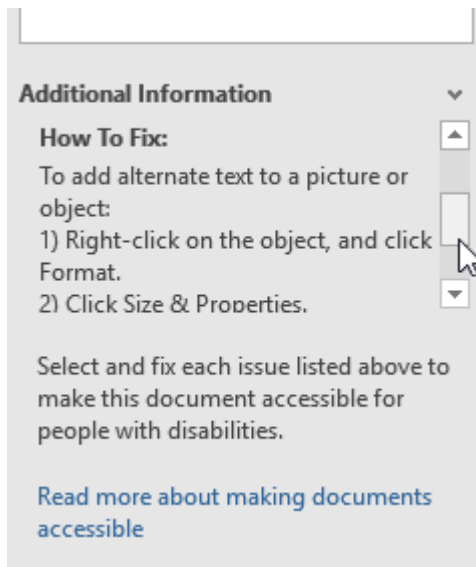
11. Once you have made the recommended changes, you will find that the Accessibility Checker will automatically indicate that no issues remain:
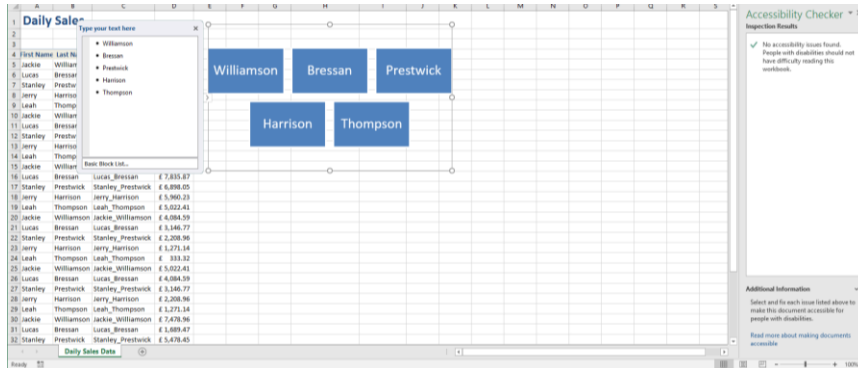
12. Save the changes that you have made to the current workbook as Activity 4-2 Complete and then close Microsoft Excel 365 to complete this activity.

Summary

In this lesson you learned about the various ways that you can enhance your workbooks in Excel 365. You should now be familiar with the customization options that are available, as well as how to manage themes to control the appearance of your workbooks. Finally, you now know how to prepare your workbooks when working with multiple audiences.

Topic C: Applying Conditional Formatting

While Excel workbooks and worksheets can contain all sorts of important data, it can sometimes be lost in a sea of information. Excel's conditional formatting feature can help bring attention to patterns or outliers in your data.

Topic Objectives

In this section, you will learn:

- About conditional formatting

- How to apply, customize, and clear conditional formatting

What is Conditional Formatting?

Conditional formatting will automatically highlight cells with data that satisfies certain criteria. It is useful for worksheets that show financial figures (where black formatting might equal positive values, while red formatting might equal negative values), test results (where results change color based on their value), or any time you want to highlight data within a certain range.

Applying Conditional Formatting Rules

To apply conditional formatting, select the target data, click "Home → Conditional Formatting," choose the formatting category, and choose a style:

Here is an overview of the categories.

- **Highlight Cells Rules:** Highlights cells that are greater than, less than, between, or equal to specified values.

- **Top/Bottom Rules:** Highlights the top or bottom numbers or percentages in the selected cells.

- **Data Bars:** Displays colored bars that are indicative of the value in the cell. (The more the cell is filled in, the higher its value compared to the other cells in the range.)

- **Color Scales:** Uses different shades of color to represent different values, from low to high.

- **Icon Sets:** Applies graphics to visually indicate a cell's value.

Here, we have added an icon set to our data:

	A	C	D	E	F	G
1	**Full Name**	**Region**	**Q1**	**Q2**	**Q3**	**Q4**
2	Adda Ellwood	Africa/Nairobi	$443,983	$431,629	$450,521	$ 433,587
3	Aguste Fessier	America/Toronto	$429,100	$425,269	$373,941	$ 127,746
4	Alethea Winyard	Europe/Lisbon	$114,980	$380,264	$429,716	$ 261,241
5	Ash Jirousek	America/Toronto	$368,612	$382,150	$264,538	$ 225,849
6	Burton Wreath	Asia/Manila	$170,905	$153,945	$219,391	$ 238,136
7	Christopher Fleis	Europe/Moscow	$473,496	$286,897	$487,919	$ 216,623
8	Cody Luton	Europe/Lisbon	$218,203	$277,489	$477,055	$ 416,420
9	Debra Godman	Africa/Nairobi	$418,579	$171,975	$448,654	$ 318,128
10	Delainey Mont	Asia/Manila	$386,315	$184,778	$162,573	$ 387,770
11	Drake Becom	Europe/Moscow	$341,113	$134,202	$178,894	$ 495,803
12	Ebonee Louch	Asia/Manila	$224,551	$115,951	$289,162	$ 280,378
13	Erica Busse	Europe/Moscow	$169,706	$281,265	$327,955	$ 296,231
14	Galvin Freiberg	Europe/Warsaw	$222,863	$255,684	$415,483	$ 390,461
15	Gardy Howsley	America/Toronto	$420,109	$314,733	$499,214	$ 353,656
16	Haley Dartan	Asia/Bangkok	$395,150	$413,390	$169,868	$ 294,643
17	Hardy Eyckel	Asia/Manila	$493,688	$285,903	$130,577	$ 349,059
18	Hercules Almon	Europe/Warsaw	$408,311	$487,532	$142,611	$ 323,942
19	Joy Liddyard	Asia/Manila	$144,480	$340,217	$103,012	$ 196,950
20	Lucky Delouch	America/Toronto	$363,379	$440,399	$394,639	$ 315,954
21	Neal Sollars	Europe/Moscow	$388,254	$418,938	$209,895	$ 470,087
22	Robert Balnaves	Asia/Manila	$255,103	$134,865	$441,530	$ 143,461
23	Rochette Shelley	America/Toronto	$198,576	$345,601	$196,293	$ 411,246
24	Rodger Campany	Asia/Manila	$467,602	$266,613	$165,388	$ 374,323
25	Ronald Burriss	Africa/Nairobi	$247,753	$474,183	$403,443	$ 483,015
26	Rosanna Skeermor	America/Toronto	$136,593	$181,573	$400,816	$ 215,603
27	Silvano Estable	Asia/Manila	$372,755	$120,213	$450,051	$ 403,664
28	Sylvan Eshmade	Europe/Lisbon	$415,418	$379,522	$460,876	$ 327,551
29	Tally Leppington	Europe/Lisbon	$436,769	$273,361	$360,605	$ 170,697
30	Tucky Habishaw	Asia/Bangkok	$210,086	$139,985	$168,733	$ 485,319
31	Wanda Ratlee	Asia/Bangkok	$167,342	$476,637	$424,504	$ 273,937

Setting Conditional Formatting Options

The options in the top two categories in the Conditional Formatting menu (Highlight Cells Rules and Top/Bottom Rules) require you to set advanced options before they can be applied. Let's use the Less Than style as an example:
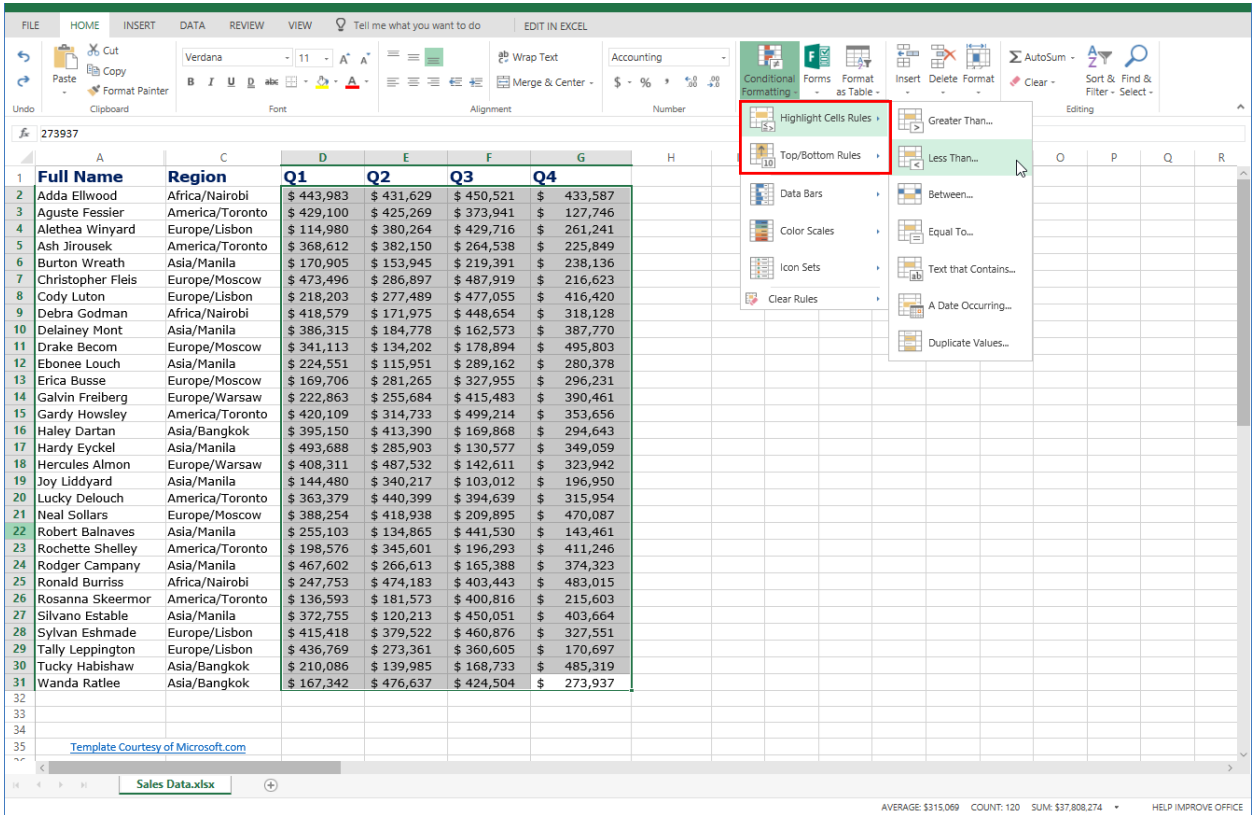
The Less Than dialog box will open when we choose this style from the Highlight Cells Rules menu:
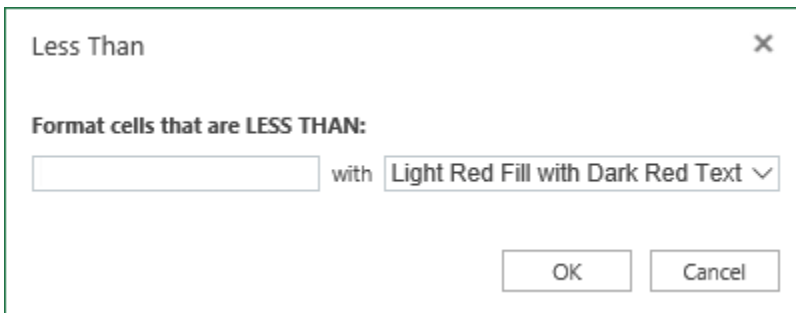
In the first field, we can enter the value we want to look for. Then, we will choose the formatting from the second menu. Here, we want values less than $250,000 to be formatted with red text:

Here are the results:

	A	C	D	E	F	G
1	**Full Name**	**Region**	**Q1**	**Q2**	**Q3**	**Q4**
2	Adda Ellwood	Africa/Nairobi	$ 443,983	$ 431,629	$ 450,521	$ 433,587
3	Aguste Fessier	America/Toronto	$ 429,100	$ 425,269	$ 373,941	$ 127,746
4	Alethea Winyard	Europe/Lisbon	$ 114,980	$ 380,264	$ 429,716	$ 261,241
5	Ash Jirousek	America/Toronto	$ 368,612	$ 382,150	$ 264,538	$ 225,849
6	Burton Wreath	Asia/Manila	$ 170,905	$ 153,945	$ 219,391	$ 238,136
7	Christopher Fleis	Europe/Moscow	$ 473,496	$ 286,897	$ 487,919	$ 216,623
8	Cody Luton	Europe/Lisbon	$ 218,203	$ 277,489	$ 477,055	$ 416,420
9	Debra Godman	Africa/Nairobi	$ 418,579	$ 171,975	$ 448,654	$ 318,128
10	Delainey Mont	Asia/Manila	$ 386,315	$ 184,778	$ 162,573	$ 387,770
11	Drake Becom	Europe/Moscow	$ 341,113	$ 134,202	$ 178,894	$ 495,803
12	Ebonee Louch	Asia/Manila	$ 224,551	$ 115,951	$ 289,162	$ 280,378
13	Erica Busse	Europe/Moscow	$ 169,706	$ 281,265	$ 327,955	$ 296,231
14	Galvin Freiberg	Europe/Warsaw	$ 222,863	$ 255,684	$ 415,483	$ 390,461
15	Gardy Howsley	America/Toronto	$ 420,109	$ 314,733	$ 499,214	$ 353,656
16	Haley Dartan	Asia/Bangkok	$ 395,150	$ 413,390	$ 169,868	$ 294,643
17	Hardy Eyckel	Asia/Manila	$ 493,688	$ 285,903	$ 130,577	$ 349,059
18	Hercules Almon	Europe/Warsaw	$ 408,311	$ 487,532	$ 142,611	$ 323,942
19	Joy Liddyard	Asia/Manila	$ 144,480	$ 340,217	$ 103,012	$ 196,950
20	Lucky Delouch	America/Toronto	$ 363,379	$ 440,399	$ 394,639	$ 315,954
21	Neal Sollars	Europe/Moscow	$ 388,254	$ 418,938	$ 209,895	$ 470,087
22	Robert Balnaves	Asia/Manila	$ 255,103	$ 134,865	$ 441,530	$ 143,461
23	Rochette Shelley	America/Toronto	$ 198,576	$ 345,601	$ 196,293	$ 411,246
24	Rodger Campany	Asia/Manila	$ 467,602	$ 266,613	$ 165,388	$ 374,323
25	Ronald Burriss	Africa/Nairobi	$ 247,753	$ 474,183	$ 403,443	$ 483,015

Clearing Conditional Formatting

To remove conditional formatting rules, click "Home → Conditional Formatting → Clear Rules," and choose what you want to clear:
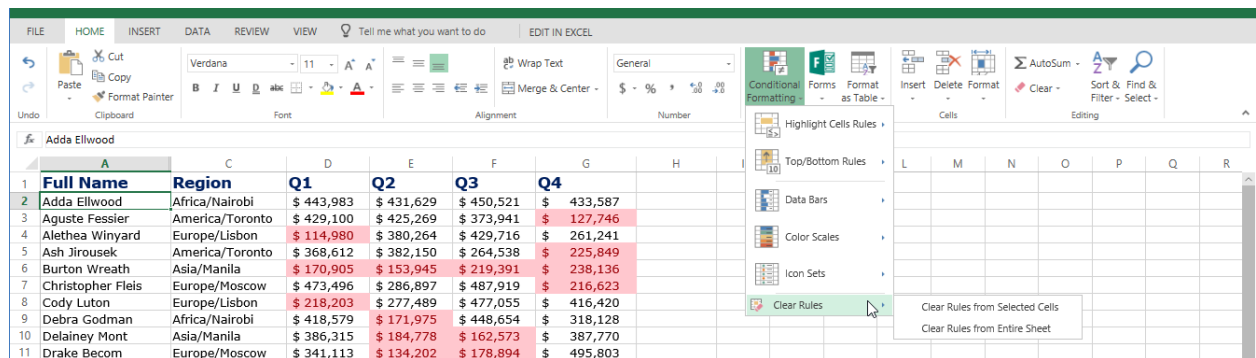
All conditional formatting rules will then be removed.

Activity 4-3: Applying Conditional Formatting

You have some ideas on how conditional formatting can make your financial data easier to interpret. In this activity, you will experiment with a few different types of conditional formatting rules.

1.   To begin, open Activity 4-3 from your USB. (Refer back to Activity 1-2 and Activity 1-3 if you need help.) Open the workbook in Editing View.

2.   First, we want to identify revenues under $250,000. Select the Revenues column:

3.   Click "Conditional Formatting → Highlight Cells Rules → Less Than:"

4. The Less Than dialog box will open. Type "250000" for the value, leave the formatting at the default setting, and click "OK:"
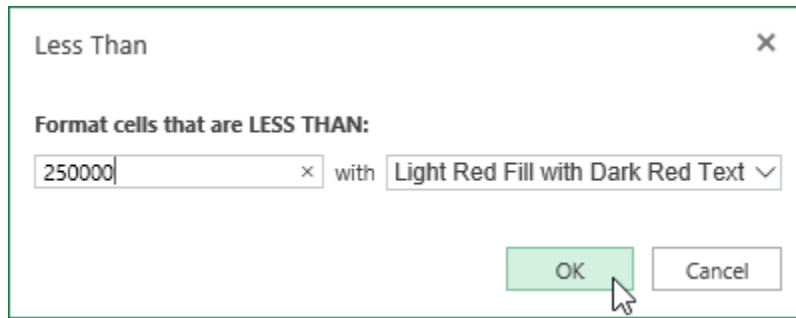
5. The formatting will be applied:

6. Now let's add an icon set to the Net Profit column. Select the column:
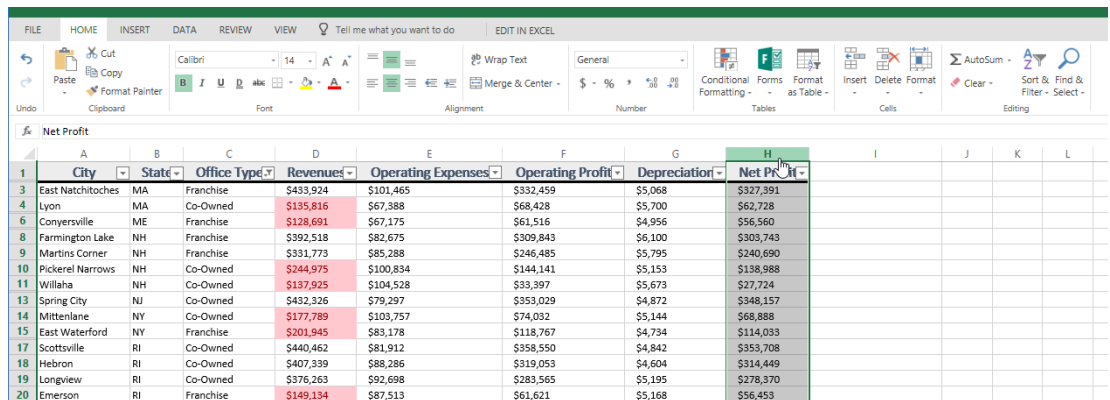
7. Click "Home → Conditional Formatting → Icon Sets → 3 Symbols" (Circled):
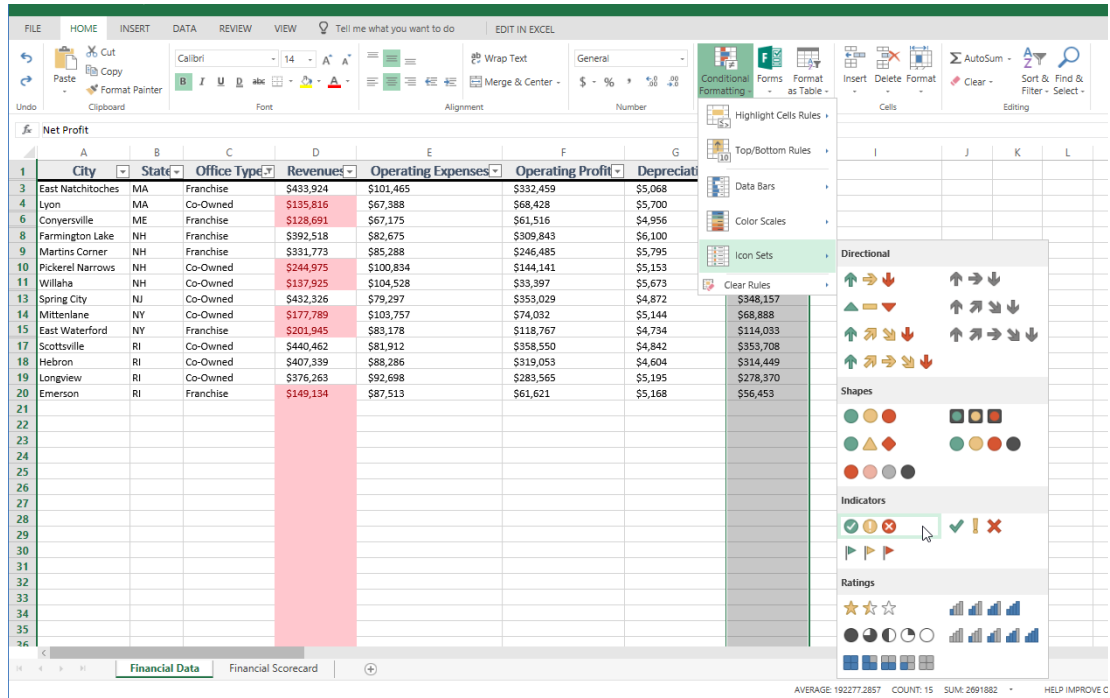
8. Review the results:
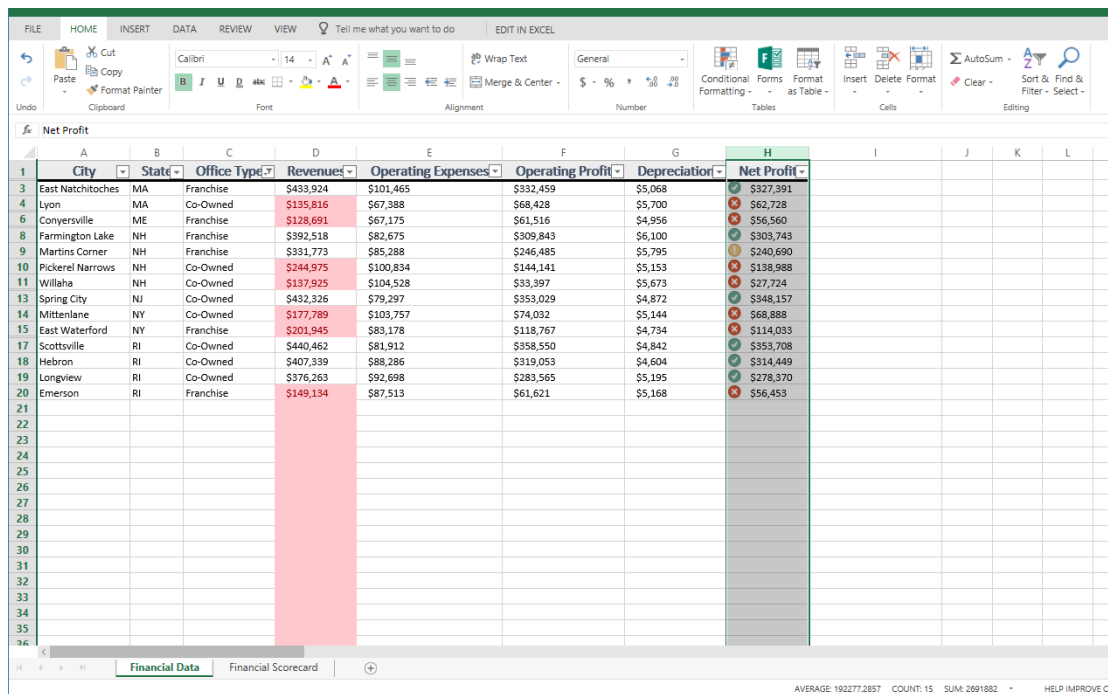
9. The red formatting applied to the empty section of Column D now looks a bit strange. Click cell D21 and press Ctrl + Shift + ↓ on your keyboard to select it and all cells below it. Then, click "Home → Conditional Formatting → Clear Rules → Clear Rules from Selected Cells:"
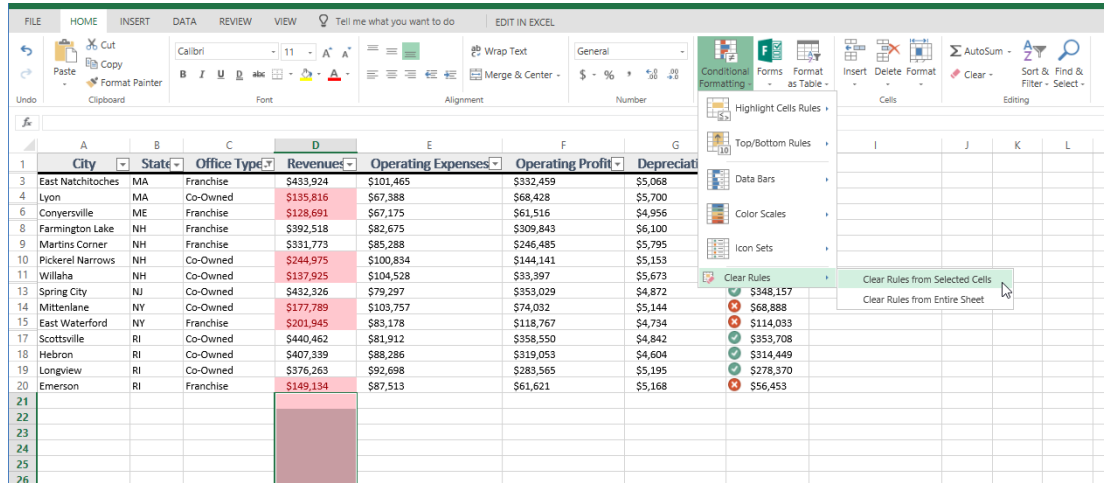
10. The formatting will now be cleaned up:

11. Save the activity as Activity 4.3 complete and close the Excel browser tab to complete this activity.

LESSON 5: LINKING CELLS & VIEW

Lesson Objectives

In this lesson you will learn how to:

- Link formula

- Freeze Panes

TOPIC A: Link cells in different workbooks

To get the greatest utility from your spreadsheets, your workbooks need to include linkages in your formula's. In this session, we will focus on linking formulas.

Topic Objectives

In this session, you will learn:

- Linking formula

- Linking between pages

- Linking between workbooks

TOPIC A: Link Cells in Different Workbooks

In Excel, you not only have the ability to link to worksheet cells within the current workbook; you can also link to worksheet cells within entirely separate workbooks. In this topic you will learn about external references and how to create them.

Topic Objectives

In this topic, you will learn:

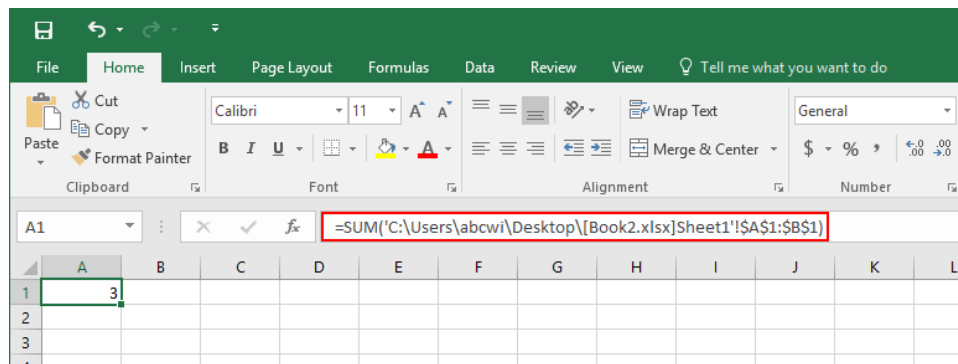- About external references

External References

External references (sometimes referred to as **links**) refer to the contents of a cell or cells within the worksheet of another workbook. The primary benefit of linking to cells in other workbooks is to save time.

While external references share much of the same syntax as typical cell references in Excel, there are some key differences. First, there are actually two different ways that you can create external references depending on if the referenced workbook is open.

If the referenced workbook is open, you can include the workbook name in square brackets, followed by the worksheet name, an exclamation point, and then the cell reference:
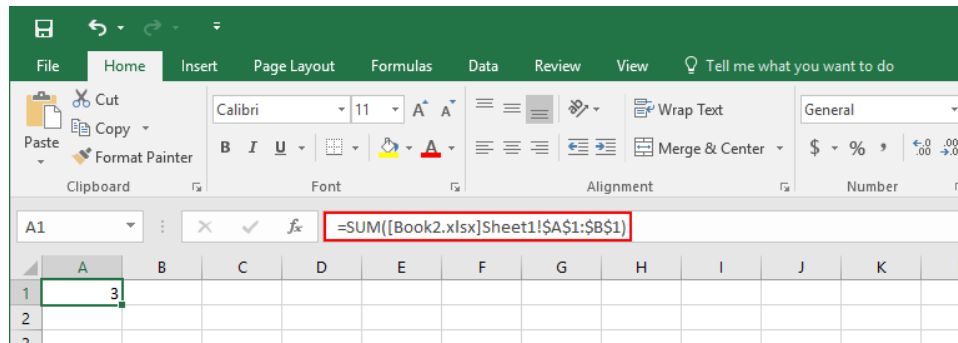
If the referenced workbook is, or will be, closed when this external reference is used or created, you need to format the external cell reference differently. In such cases, the external reference needs to include the entire file path to the workbook in question, followed by the workbook name in square brackets, the worksheet name, an exclamation point, and finally the cell reference:


(Note that the file path, workbook name, and worksheet name need to be enclosed in single quotation marks when creating this external reference type.)
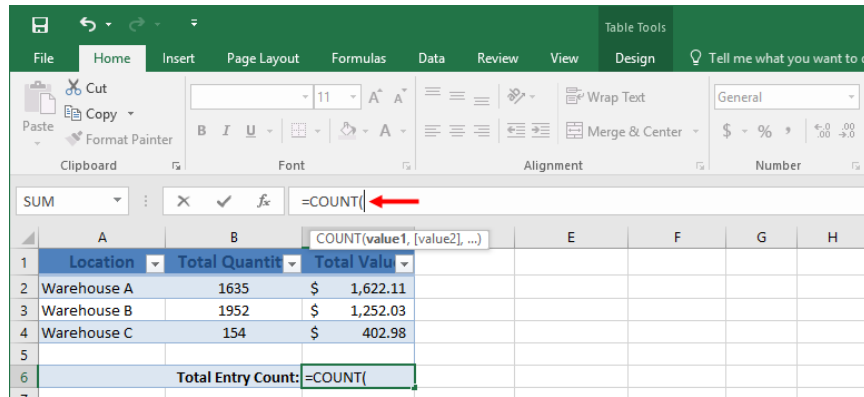
Activity 5-1

Linking Cells in Different Workbooks

The workbook that you are working with (Activity 5-1A) separately summarizes data from another workbook (Activity 5-1B). In the first workbook (Activity 5-1A) you would like to display a count of the number of entries within that other workbook (Activity 5-1B), without having to copy those entries manually.
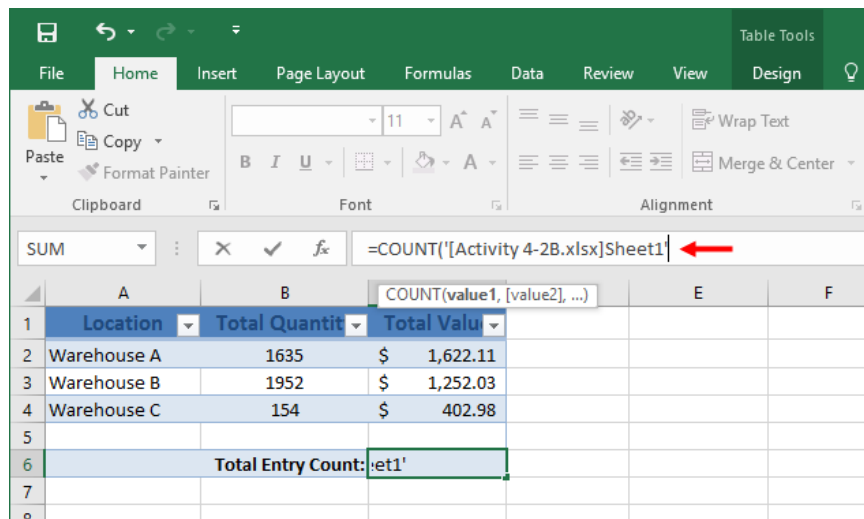
1. To begin, open Activity 5-1A from your Exercise Files folder:
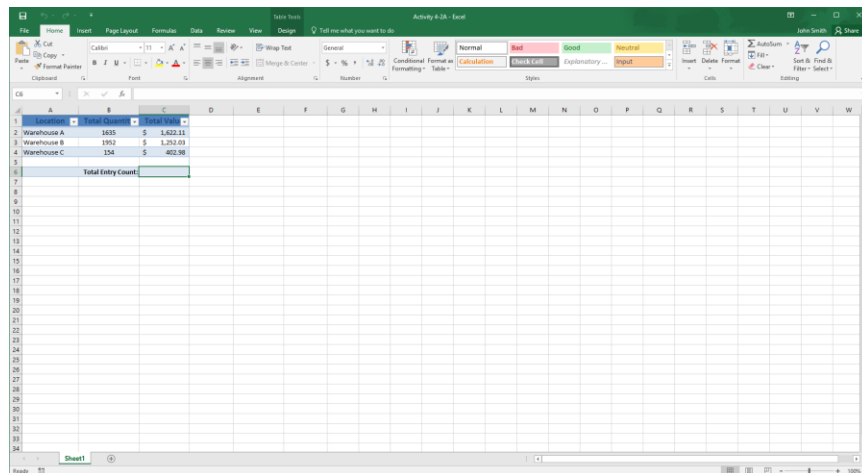
2.   Ensure that cell C6 is selected in the current worksheet and then click inside the
Formula Bar. Type "=COUNT(":

3.   With the source workbook open, you don't need to include the file path. With that
in mind, open Activity 5.1B.xlsx and click and drag to select A2:A35:

4. Press Enter on your keyboard. The value calculated using the external reference data will now be displayed within cell C6:

	A	B	C
1	Location ▼	Total Quantit ▼	Total Valu ▼
2	Warehouse A	1635	$ 1,622.11
3	Warehouse B	1952	$ 1,252.03
4	Warehouse C	154	$ 402.98
5			
6		Total Entry Count:	34
7			
8			

5. Save your work as Activity 5-1 Complete and then close Microsoft Excel.

TOPIC B: Freeze Panes

It is sometimes convenient to be able to keep an eye on one part of a spreadsheet while simultaneously viewing other parts of the same spreadsheet. You can do this using the Freeze feature.

To use Freeze, open a workbook window and click "View → Freeze Panes:"
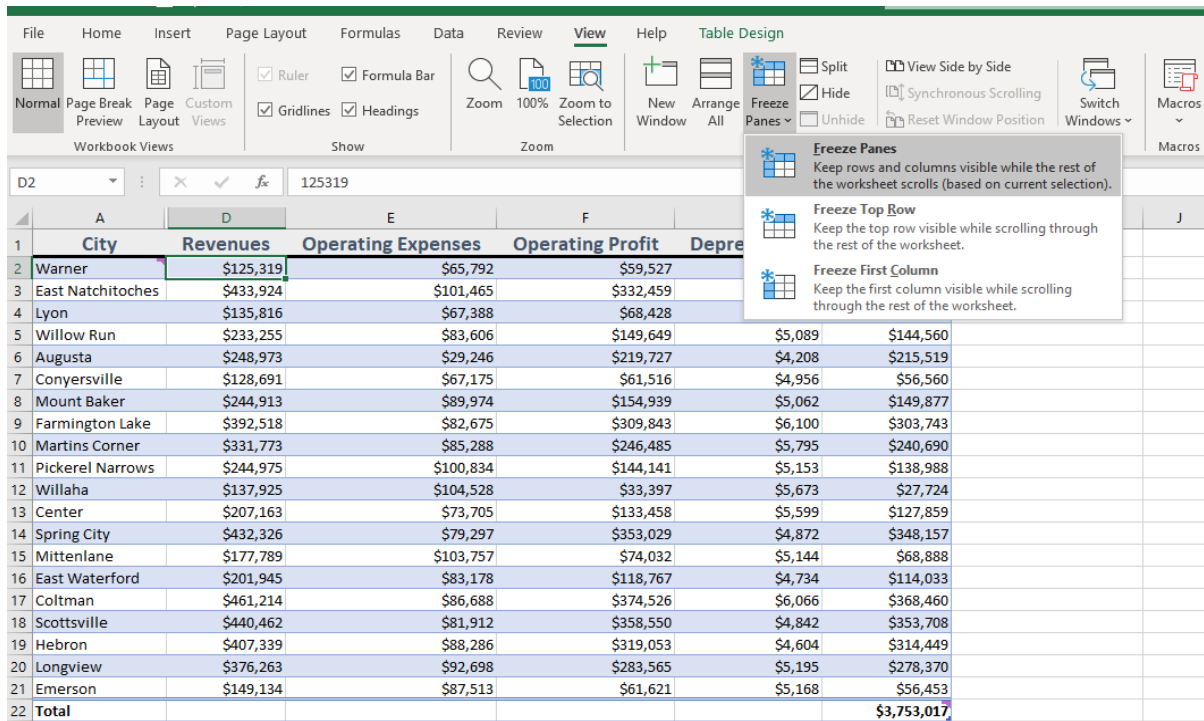
The following options will be displayed:

| Freeze Panes	If you select cells before clicking this option, everything to the left of and above the selection will remain frozen.
Freeze Top Row	This will freeze the top row. Use this option to keep column headings visible while scrolling vertically through the data.
Freeze First Column	This will freeze the first column. Use this option to keep row headings visible while scrolling horizontally through the data.

Activity 5-2: Freeze Panes

In this activity, we will explore the freeze panes options in Excel 365.

1.   To begin, open Excel. (Refer back to Activity 1-1 if you need help.)

2.   Open Activity 5-2.

3.   Ensure you are on the Financial Data worksheet and click the View tab:

4 Notice that the gridlines are still visible here. However, we want to freeze the
   header row on this sheet as more data may be added to future reports. Click
   "Freeze Panes → Freeze Top Row:"
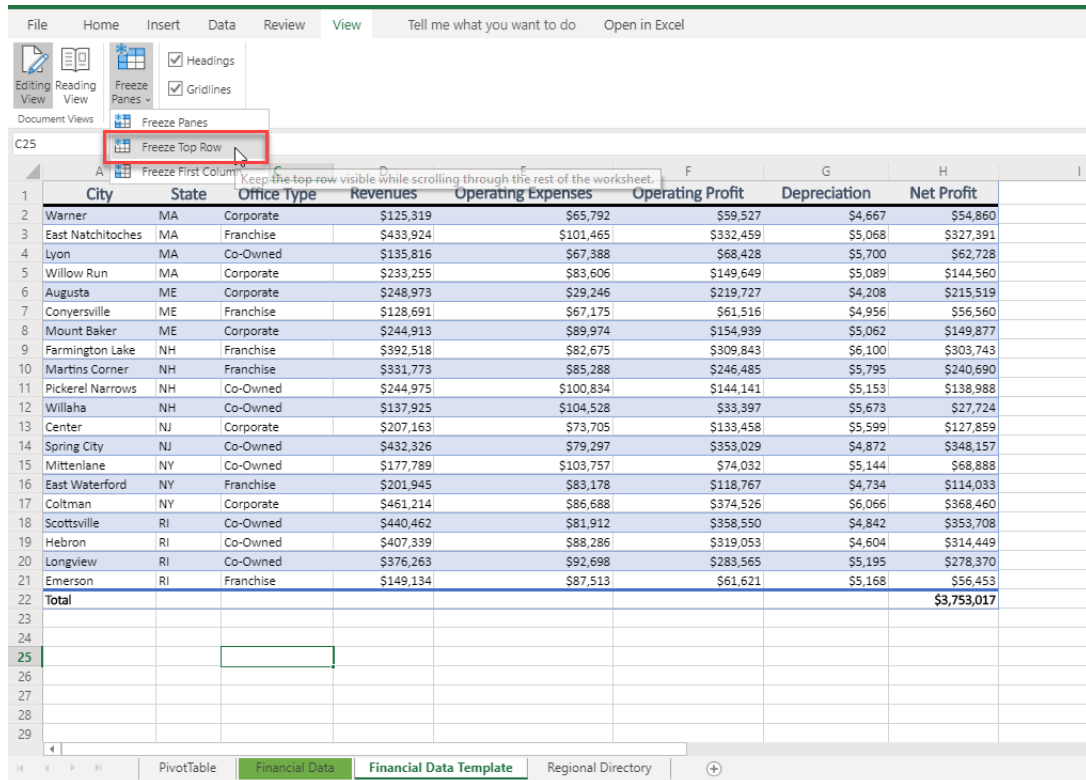
5 Scroll down in the workbook. Notice that the first row remains in place.

6 Save As 'Activity 5-2 complete' and close Excel to complete this activity.

Course Summary

Congratulations on completing the second part of Microsoft Excel 365 training. During this course, you learned how to:

- Analyze data with logical and lookup functions

- Organize worksheet data with tables

- Visualize data with charts

- Enhance workbooks

You should know which functions are used to complete which tasks, as well as how to use those functions for data analysis. You should be comfortable with the variety of data visualization tools that are available in Excel, as well as the many ways that you can enhance your workbooks.

If you want more the Excel Advanced course will be running as a public program, or alternatively call us for information about running it in house – for a daily fee rather than a per participant fee. Maximum 10 participants.

APPENDICES

Keyboard Shortcut Quick Reference Sheet

Editing Commands	Cut	Ctrl + X
	Copy	Ctrl + C
	Paste	Ctrl + V
	Undo	Ctrl + Z
	Redo	Ctrl + Y
	Start a new line in the same cell	Alt + Enter
	Print worksheet	Ctrl + P
Select Commands	Select a range of cells	Shift + Arrow keys
	Select a column	Ctrl + Spacebar
	Select a row	Shift + Spacebar
	Open the Find dialog	Ctrl + F
	Open the Replace dialog	Ctrl + H
	Open the Go To dialog	Ctrl + G
Formatting Commands	Apply bold	Ctrl + B
	Apply italics	Ctrl + I
	Applying underlining	Ctrl + U
	Increase font size	Ctrl + Shift + >
	Decrease font size	Ctrl + Shift + <
	Clear formatting	Ctrl + D

Navigation Commands	Move up one cell	Up Arrow Shift + Enter
	Move down one cell	Down Arrow Enter
	Move right one cell	Right Arrow Tab
	Move left one cell	Left Arrow Shift + Tab
	Go to the beginning of the row	Home
	Go to cell A1	Ctrl + Home
	Go to the last cell of used range	Ctrl + End
	Move down one screen (28 rows)	Page Down
	Move up one screen (28 rows)	Page Up
	Move to the edge of the current data region	Ctrl + Right Arrow or Ctrl + Left Arrow
	Switch to next sheet	Alt + Ctrl + Page Down
	Switch to previous sheet	Alt + Ctrl + Page Up
Insert Commands	**Insert new worksheet**	**Shift + F11**
	Insert hyperlink	Ctrl + K
	Follow hyperlink	Ctrl + Enter
	Insert table	Ctrl + L
	Open/close Comments pane	Shift + F2
Calculate Data	Calculate workbook (refresh data)	F9
	Insert AutoSum function	Alt + Equals (=)
	Open Insert Function dialog box	Shift + F3

Glossary

absolute reference

A type of reference that will not change even if it is moved or copied to another location.

arguments

Data used by functions to complete calculations.

AutoFill

A feature that is used to automatically fill sequential data into a range of cells.

cell

The intersection of a row and column on a worksheet.

charts

Visual representation of numeric data.

conditional formatting

Formatting that will highlight cells whose data satisfies certain criteria.

filtering

Customizing the data view based upon set criteria.

fill

Formatting that adds background color to cell(s).

fill handle

The small black box that appears in the bottom right-hand corner of a selected cell or cell range. Used to activate the AutoFill feature.

Flash Fill

Feature that will automatically extract or combine data based on a pattern.

font

A set of typeface.

Format Painter

A tool that is used to copy formatting from one selection of text to another.

formula

A mathematical relationship expressed through symbols.

formula bar

A part of the Excel interface that displays the cell name, contents, and/or formulas in a selected cell.

function

Pre-made operations that are used to perform calculations.

mixed references

Cell references that include both relative and absolute references.

relative reference

A cell reference that will change relative to its positioning in a worksheet.

spreadsheet

Either a paper or electronic file that is used to store and work with data (mostly numbers) in a tabular fashion.

table

A dataset that is comprised of rows and columns but is treated as one object (unlike regular data ranges).

Tell Me

Natural language help feature accessed directly on the ribbon interface.

workbook

An Excel file that stores multiple worksheets.

worksheet

An electronic spreadsheet.

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Ballarat Computer Training

https://theprovengroup.com.au/event-category/computer-training/