

Excel Charts

The Computer Workshop, Inc.

800-639-3535

www.tcworkshop.com training@tcworkshop.com

Excel: Charts Rel 1.1, 1/14/2021



Lesson Notes

Excel

Charts

Course Number: 0200-230-19-W Course Release Number: 1.1

1/14/2021

Developed by: Brian Ireson Suzanne Hixon Thelma Tippie

Edited by: Suzanne Hixon Jeffrey DeRamus

Published by: RoundTown Publishing 5200 Upper Metro Place, Suite 140 Dublin, Ohio 43017

for

The Computer Workshop, Inc. 5200 Upper Metro Place, Suite 140 Dublin, Ohio 43017 (614) 798-9505

Copyright © 2020 by RoundTown Publishing. No reproduction or transmittal of any part of this publication, in any form or by any means, mechanical or electronic, including photocopying, recording, storage in an information retrieval system, or otherwise, is permitted without the prior consent of RoundTown Publishing.

Disclaimer:

Round Town Publishing produced this manual with great care to make it of good quality and accurate, and therefore, provides no warranties for this publication whatsoever, including, but not limited to, the implied warranties of merchantability or fitness for specific uses. Changes may be made to this document without notice.

Trademark Notices:

The Computer Workshop, Inc. and The Computer Workshop logo are registered trademarks of The Computer Workshop, Inc. [Microsoft], [Windows], [PowerPoint], [Excel], [Word], and [Access] are registered trademarks of Microsoft Corporation. [Photoshop] and [InDesign] are a registered trademark of Adobe. All other product names and services identified throughout this book are trademarks or registered trademarks of their respective companies. All NASA information was obtained from public resources. Using any of these trade names is for editorial purposes only and in no way is intended to convey endorsement or other affiliation with this manual.

• Table of Contents

Table of Contents	iv
Using this Manual	vii
To Download Data Files	vii
Conventions	viii
Conventions Used in this Manual	viii

Lesson 1: Chart Overview and Types

Chart Overview
Charts Introduction4
Chart Terminology4
The Chart Window
Identifying Chart Objects5
Quick Analysis
Recommended Charts
Chart Types12
Bar Charts
When to Use a Bar Chart13
Subtypes of Bar Charts14
Creating a Bar Chart15
Column Charts
When to Use a Column Chart18
Subtypes of Column Charts19
Creating a Column Chart
Line Charts
When to Use a Line Chart25
Subtypes of Line Charts25
Creating a Line Chart26
Scatter (XY) Charts
When to Use a Scatter Chart
Subtypes of Scatter Charts
Creating a Scatter Chart32
Pie Charts
When to Use a Pie Chart35
Subtypes of Pie Charts36
Creating a Pie Chart37
Creating a Pie in Pie Chart
Changing to a Pie of Pie Chart
Editing the Secondary Pie or Bar
Area Charts
When to Use an Area Chart42
Subtypes of Area Charts43
Creating an Area Chart44
Bubble Charts
When to Use a Bubble Chart47



0

Table of Contents, continued

Subtypes of Bubble Charts	48
Creating a Bubble Chart	48
Doughnut Charts	50
When to Use a Doughnut Chart	50
Subtypes of Doughnut Charts	51
Creating a Doughnut Chart	51
Stock Charts	54
Subtypes of Stock Charts	54
Creating a Stock Chart	56
Surface Charts	59
Chart Subtypes for Surface Charts	60
Radar Charts	63
Funnel Charts	66
Creating A Funnel Chart	66
Waterfall Charts	67
Box and Whiskers Charts	72
Creating A Box and Whisker Chart	72
Treemap Charts	75
Creating a Treemap Chart	75
Sunburst Charts	77
Create a sunburst chart	77

Lesson 2: Modifying a Chart

Modifications83	3
Redefining Chart Data	4
Switching Rows and Columns84	4
Select Data84	4
Filtering Charts86	6
Moving Charts	9
Moving Charts89	9
Layouts and Styles92	1
Chart Layouts91	1
Chart Styles Group92	1
The Chart Styles and Colors button	2
To create a new custom color theme	2
Chart Elements94	4
Chart Elements94	4
Adding and Removing Chart Elements92	7
Adding Chart Elements From the Design Tab97	7
Adding Chart Elements Using the Element Button92	7
Adding Chart Elements98	8
Removing Chart Elements98	8
Formatting Chart Elements100	0
Textual Elements102	1
Font Formatting102	1

0

Table of Contents, continued

Font Styling With WordArt	
Applying WordArt to Text	
Formatting Graphic Elements	
Formatting the Axis and Gridlines	107
Saving a Chart Template	111
Save the Template	111
Using the Chart Template	112

Lesson 3: Charts Advanced

Sparklines	119
Creating a Sparkline	119
Formatting Sparklines	120
Customizing Sparklines	121
Trendlines	124
Trendline Overview	124
Linear Trendlines	125
Logarithmic Trendlines	
Polynomial Trendlines	
Power Trendlines	126
Exponential Trendlines	127
Moving Average Trendlines	127
Creating and Formatting Trendlines	
Customizing Trendlines	
Error Bars	131
Add Error Bars	131
Modifying the Error Bar	133
Removing Error Bars	133
Combination Charts	
Create a Combination Chart	
Gauge Chart	
Creating Gauge Charts	139

Appendix A: Gauge Charts

Gauge Chart	iii
Creating Gauge Charts	iv



Preface Using this Manual

Welcome to the *Excel 2010 Charts* course. This manual and the data files are designed to be used for learning, review and reference after the class. The data files can be downloaded any time from *The Computer Workshop* website:

http://www.tcworkshop.com

There is no login or password required to access these files. You will also find handouts and supplementary materials on the website in the Download section.

To Download Data Files

Once on *The Computer Workshop* website, locate and click the *Student Resources* link in the top navigation bar. When on the *Student Resources* page, click the **Data Files** button.

- 1. *Data Files* page displays a list of general application types.
- 2. Click once on the *Microsoft Office Courses* link.
- 3. Click once on the software related to the course.
- 4. Click once on the version related to the course.
- 5. If there are multiple folders, click on the *TCW* folder.
- 6. Click on the course name to download the data files.

You can choose to open or save the zipped folders content to your computer.

While on the *Student Resources* page, you can also access handouts by clicking the **Handouts** button. Handouts are in PDF format and also available to you without login or password. Simply open the PDF and either print or save to your computer.



O Conventions

Conventions Used in this Manual

The hands-on exercises (Actions) are written in a two-column format. The left column ("Instructions") gives numbered instructions, such as what to type, keys to press, commands to choose from menus, etc. The right column ("Results/ Comments"), contains comments describing results of, reasons for, quick keys, etc. for the instructions listed on the left.

Key names and Functions are bold and enclosed in square brackets:

[Enter], [Tab], [F5], [F10]

Keys you press simultaneously are separated by a plus
 (+) sign, typed in bold and enclosed in square brackets.
 You do not press the plus.

[Shift + F5]

Keys you press in sequence are separated by a space, bold and enclosed in square brackets.

[Home] [Down Arrow]

- Ribbon tab names are in bold and italic: Example: *Home*
- Sroup names are in bold: Example: Font
- Save As
- Button names are bold and enclosed in square brackets: Example: [Sort]
- Solution for the second second

This is the first day of the rest of your life.

Information that you need to supply will be indicated with pointed brackets. Example: Type: <your name>. Excel: Charts Rel. 1.1, 1/14/2021



Lesson 1: Chart Overview and Types

Lesson Overview

You will cover the following concepts in this chapter:

- Chart Overview
- Charts Introduction
- The Chart Window
- Quick Analysis
- Recommended Charts
- Chart Types
- Bar Charts
- Column Charts
- Line Charts
- Scatter (XY) Charts
- Pie Charts

- Area Charts
- Bubble Charts
- Doughnut Charts
- Stock Charts
- Surface Charts
- Radar Charts
- Funnel Charts
- Waterfall Charts
- Box and Whiskers Charts
- Treemap Charts
- Sunburst Charts



Lesson Notes

Chart Overview

It can be hard to discern patterns or relationships that exist within basic tables of numerical entries. *Excel's* powerful charting tools help create a more meaningful representations of your data by making it easy to build professional looking charts such as the one displayed below.



A chart is a graphic representation of your worksheet data. Using charts to represent worksheet data often creates a better understanding of your data rather than simply presenting the numbers in a spreadsheet. They also a great way to add branding to your presentations.

One of the major changes in *Excel* is the way that charts are created and handled. In previous versions of *Excel*, charts were often created with the chart wizard. *Excel*, has taken a new approach that a creating professional looking charts in just a few clicks. Instead of the old chart wizard, *Excel* provides a series of chart options that are found on the *Insert Tab* and with the *Quick Analysis Smart Tag* that appears when multiple cells are selected.



Once the chart is created and selected, a set of contextual tabs are available in the ribbon. The *Chart Tools* group of tabs are *Design* and *Format*. As well as new chart buttons to Add/ Remove Chart Elements, Apply Formatting Styles And Colors, and Filtering.

This lesson will cover the elements of a chart, different chart types and their uses to help you gain a better understanding of which chart will best represent your data.

Ocharts Introduction

Note The **Y-axis** is usually the vertical axis and contains data. The **X-axis** is usually the horizontal axis and contains categories. A chart is a graphic representation of worksheet data. Using a chart to represent worksheet data often leads to a better understanding of the data rather than simply presenting the numbers on a spreadsheet.

Illustrated below is a spreadsheet showing the Sales for Widget International and a corresponding chart. Charts are easy and fun to work with so let begin with getting familiar with some of the terminology for creating graphs and charts.

Chart Terminology

The figure below shows a chart with the basic elements labeled. It also shows you the data that was used to create the chart, which will help you identify what you will need to select in your spreadsheet to create a meaningful chart. Notice the Total Column and Row were not selected to prevent the Chart from being out of proportion. Also, the Title was not selected because it is a merged cell and would have required selecting the data in the Total Column. Instead, the Chart Title was added after the Chart was created.



The Chart Window

Identifying Chart Objects

To change your chart, you need to first select the chart object you would like to change. When you point to an item in the chart a tooltip will appear naming the object.

Chart Objects:

- **Chart Area** is the whole chart.
- Gridlines—are the vertical and/or horizontal lines that are useful in guiding the eye to more easily identify the value associated with each series.
- Plot Area the area of the chart where the values are graphed.
- Legend—is the color key for the value series. By default this would be the row labels.
- Category Axis—if the series is by rows it will display the column labels. If the series is by column, the row labels will be displayed.
- **Value Axis**—displays the range of values plotted.
- Value Series data in the default column chart are plotted by *row* in column bars called "*series*".
- ♦ Wall—appears in chart types such as columns and bar charts. It is the area behind the columns and bars.
- ♦ **Floor**—is connected to the wall in 3-D charts.
- Chart Elements button—This allows you to quick add or remove Chart Elements.
- Chart Styles and Colors button Allows you quick access to the pre-built styles and color schemes.
- Filter Chart button Allows you to filter the chart without having to redefine the data set.









Ins	tructions:	Results/ Comments:			
7.	Locate the Quarter 1 Category.	This is the four columns above Quarter 1 and contains one data point for each sales person.			
8.	Locate the first column for each quarter - note they will be the same color.	Data markers of the same color constitute a data series - in our example, this represents 4 quarters of Sales for John.			
9.	Locate the first Quarter 1 column.	This is the data that represents individual values plotted in a chart and are represented by bars, columns, lines, pie or doughnut slices, dots, and various other shapes called data markers. (In our example, this column is for John's 1st Quarter Sales.)			
10.	Locate the [Chart Elements] button.	To the right of the selected chart. This allows for quick access to add, remove, and reposition chart elements.			
11.	Locate the [Chart Styles] button.	To the right of the selected chart. Using this button allows you to choose from the list of pre-defined chart style and color schemes.			
12.	Locate the [Chart Filtering] button.	To the right of the selected chart. This allows you to choose what data is displayed in the chart without having to reselect data.			

Ouick Analysis

When you select multiple cells in *Excel*, you will see the *Quick Analysis Smart Tag* appear to the lower right corner of the selection.

Note When a cell range is actively selected, use the **[Ctrl + Q]** keyboard shortcut to open the *Quick Analysis* dialog.

ormatting	Charts	Totals	Tables	Sparklir	nes
		\leq	\sim		1
lustere	Clustere	Stacked	Line	Stacked	More

This tool offers live previews of basic conditional formatting, recommended chart types, auto totaling options, recommended tables, and sparklines. By clicking the desired header in the *Smart Tag* you will see the set of options below.

When choosing the *Charts* option, you are shown a set of recommended charts which are based on the structure of the selected data. If none of the displayed chart types are appropriate, then choose the *More...* option to open the *Insert Chart* dialog. When in the *Insert Chart* dialog, click the *All Charts* tab to have access to every type of chart.







I	nstructions:	Results/ Comments:			
1.	Open the QuickAnalysis.xlsx file				
2.	Select cells A3:E7.		This is the data set to make into a chart.		
3.	Click the <i>Smart Tag</i> icon.		The icon only appears when more than one cell is selected. It will be located at the lower right corner of the selected range of cells. The <i>Quick Analysis</i> set of options are displayed.		
4.	Select the <i>Charts</i> option at the top of the <i>Quick Analysis</i> window.		The list of options changes to show recommended charts.		
5.	Examine the list of <i>Recommended Charts</i> by hovering over each one.		As you hover over the recommended chart a preview of that chart is displayed.		
6.	Choose the first option.		The chosen chart type is inserted .		

Recommended Charts

You now can let *Excel* offer suggested chart types based on the structure of the selected data. This can be done using the *Quick Analysis Smart Tag* as outlined earlier or by clicking the **[Recommended Charts]** button within the **Charts Group** on the *Insert Tab* in the ribbon.



Clicking the **[Recommended Charts]** button opens the *Insert Chart* dialog to the *Recommended Charts* tab in the window. Scroll through the list of charts on the left side of the window to see if there is one that suits your needs.



When you select the type of chart you need double-click chart thumbnail or click the **[OK]** button



Instructions:			Results/ Comments:
1. The QuickAnalysis.xlsx file should still be open.			If not, reopen the file.
2.	Select Sheet2.		
3.	Select cells A3:E7.		This is the data set to make into a chart.
4.	On the <i>Insert Tab</i> in the Charts Group , click the [Recommended Charts] button.		The <i>Insert Chart</i> dialog opens with the <i>Recommended Chart</i> tab active.
5.	Use the scroll bar on the left side of the window to see the list of charts <i>Excel</i> recommends.		<i>Excel</i> bases these on the structure of the selected data.
6.	Click on each one in the list to see a larger view to the right of the window.		
7.	Double-click whichever chart you like.		The selected chart is inserted.
8.	Close the file without saving.		[Ctrl + W].

Ochart Types

Excel offers many chart types and choosing the right one will be critical in conveying the information held within the raw tabular data in a meaningful manner. Each chart type displays relationships or trends contained in the data. Depending on the structure of the data in the spreadsheet will help in choosing the appropriate type of chart.



Bar Charts

Bar Charts are useful for comparing data points in one or more data series. Although they can be used to clearly illustrate comparisons among individual items.

For a bar chart, data should be structured with categories along the vertical axis and values along the horizontal axis.

When to Use a Bar Chart

- If you have one or more data series that you want to plot.
- If your data contains positive, negative, and zero (0) values.
- If you want to compare the data for numerous categories.
- ♦ If the axis labels are long.
- ♦ If the values that are shown are durations.



Bar Chart displaying single data series

Printer Problems	Down Time in Muntues		D		M			
Jams	25		Do	own Hm	ne în iviur	itues		
Misfeeds	14							
Out of Ink	19	Connection Problems						
Out of Paper	5	Devues Svenes		_				
Power Surges	8	Power Surges						
Connection Problems	45	Out of Paper						
		Out of Ink						
		Misfeeds						
		Jams						
			0	10	20	30	40	50
E	Bar Chart disp	laving mu	∘ ıltir	¹⁰ le da	20 ata se	30 ries	40	



Subtypes of Bar Charts

There are several Bar Chart types to choose from:

Clustered bar and clustered bar in 3-D: Compare values across categories. In a clustered bar chart, the categories are typically organized along the vertical axis, and the values along the horizontal axis. A clustered bar in 3-D chart displays the horizontal rectangles in 3-D format; it does not display the data in 3-D format.



Stacked bar and stacked bar in 3-D: these types of bar charts show the cumulative values of individual items in the data set. The 3-D chart variations still display the data along only two axes, it does not allows for a third axis.



100% stacked and 100% stacked in 3-D: Compares the percentage each value item contributes to a total across categories.



Bar Charts, continued

Creating a Bar Chart

- Select the data to be charted.
 - For a single data series chart, the data should be arranged with the headers (categories) at the top of the two columns. The first column representing the data points and the second representing the values.

Printer Problems	Down Time in Muntues
Jams	25
Misfeeds	14
Out of Ink	19
Out of Paper	5
Power Surges	8
Connection Problems	45

For a multi point data series chart, the data should be arranged with the headers (categories) in the first row and the data points and the first column.

	Sales	Cost	Expenses	Income
Week 1	\$6,458.00	\$ 3,551.90	\$ 968.70	\$1,937.40
Week 2	\$3,259.00	\$ 1,792.45	\$ 488.85	\$ 977.70
Week 3	\$8,488.00	\$ 4,668.40	\$1,273.20	\$2,546.40
Week 4	\$7,259.00	\$ 3,992.45	\$1,088.85	\$2,177.70

On the *Insert Tab* in the Charts Group, click the [Insert Column or Bar Chart] button drop-down and choose the type of Bar Chart you want to create.





Instructions:		Results/ Comments:
1.	Open the Charts.xlsx file from the data files folder.	
2.	Activate the <i>Bar Single Series</i> worksheet.	Click the sheet tab at the bottom of the worksheet.
3.	Select cells A1:B7 .	This is the data set that will be charted. Notice the structure of the data; the categories are listed in the vertical (Y) axis and the values are along the horizontal (X) axis.
4.	Click the <i>Insert Tab</i> on the ribbon.	From here you have access to the charts types that <i>Excel</i> can generate from your data.
5.	In the Charts Group , click the [Insert Column or Bar Chart] button drop-down and choose the <i>Clustered Bar</i> from the 2-D set of options.	The chart is added to the spreadsheet. It shows a comparison of each category in the data set.
6.	Click into the chart and set the cursor on the border of the chart, the cursor changes to a four sided arrow. Click and drag the chart below the data set.	The chart is repositioned. If the cursor changes to a two headed arrow you are able to resize the chart.
7.	With the chart actively selected, notice the ribbon now displays the <i>Chart Tools</i> set of tabs, with <i>Design</i> and <i>Format</i> tabs.	These are contextual tabs and are only available when the chart is actively selected.
8.	Click any cell in the spreadsheet to deselect the chart.	The <i>Chart Tools</i> tabs are no longer displayed.
9.	Reselect the chart by clicking on it.	The <i>Chart Tools</i> tabs are re-displayed.



Instructions:	Results/ Comments:
10. Click the <i>Chart Tools Design Tab</i> .	The ribbon displays the <i>Design Tab</i> where you can begin making modifications to the chart.
11. Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The <i>Bar Chart</i> category should be active.
12. Note the different bar charts across the top of the dialog.	All the 2-D and 3-D bar charts are displayed; Clustered, Stacked and 100% Stacked.
13. Choose any of available <i>Bar Chart</i> types and click the [OK] button.	The chart is changed. You can also double- click the chart type you want to apply it.
14. Repeat steps 11 through 13 to change the chart again, try each to see how they look.	Explore all the <i>Bar Chart</i> options.
15. Activate the <i>Bar Multiple Series</i> worksheet.	Click the sheet tab at the bottom of the spreadsheet.
16. Select cells A2:E6 .	This is the data set to be charted. Notice the structure of the data, there are categories along both the X and Y axes of the data.
17. Click the <i>Insert Tab</i> on the ribbon.	
18. In the Charts Group , click the [Insert Column or Bar Chart] button drop-down and choose the <i>Clustered Bar</i> from the 2D set of options.	The chart is added to the spreadsheet.
19. Try changing the chart type again to find one you like by repeating steps 10 through 13.	The list of Bar Chart options is the same as before.
20. Save the file as MyCharts . Leave the file open.	Click the <i>File Tab,</i> then the [Save] button or use the key command, [CTRL + S] .

Column Charts	Column Charts use vertical bars to compare data points in one or more data series across categories. These charts are useful when showing data changes over a period of time or for illustrating comparisons among items.	
	The data should be structured in columns or rows on a worksheet to be plotted in a column chart. In column charts, categories are typically organized along the horizontal axis and values along the vertical axis This structure is a reversal of what is used to create bar charts. When to Use a Column Chart	
	If you have one or more data series that you want to plot.	
	If your data contains positive, negative, and zero (0) values.	
	If you want to compare the data for numerous categories side by side.	
	QTR 1 QTR 2 QTR 3 QTR 4 140000 2010 100030 98050 103000 116200 2011 105000 101300 89600 108000	







Column Charts, continued

Subtypes of Column Charts

There are several Column Chart types to choose from:

Clustered column and clustered column in 3-D: use these to compare values across categories or when you have categories that represent: ranges of values, specific scale arrangements, or when you have names that are not in any specific order.. Clustered column charts display values on two axes only.



Stacked column and stacked column in 3-D: show relationships of individual items to the whole, comparing the contribution of each value to a total across categories. Use a stacked column chart when you have multiple data series and when you want to emphasize the total.



100% stacked column and 100% stacked column in
 3-D: compares the percentage each value contributes to a total across categories.



Column Charts,

continued

(0)

3-D column: 3-D column charts use three axes that you can modify (a horizontal axis, a vertical axis, and a depth axis) and they compare data points along the horizontal and the depth axes.



Creating a Column Chart

- Select the data to be charted.
 - For a single data series chart, the data should be arranged with the headers (data points) in the top row. The first cell in the second row should contain the category of the series.

	QTR 1	QTR 2	QTR 3	QTR 4
2010	100030	98050	103000	116200

For a multi point data series chart, the data should be arranged the way as a single data series but each additional row add another category.

	QTR 1	QTR 2	QTR 3	QTR 4
2010	100030	98050	103000	116200
2011	105000	101300	89600	108000
2012	109970	104550	88200	99800
2013	102940	107800	104359	111600
2014	119910	111050	110665	103400
2015	124880	114300	93056	75200
2016	129850	117550	97339	96750

0

Column Charts, continued

Click the [Insert Column or Bar Chart] button dropdown and choose the type of Column Chart use wish to create. The button is found on the *Insert Tab* in the Charts Group.





Instructions:		Results/ Comments:
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Column Single Series</i> worksheet.	Click the sheet tab at the bottom of the spreadsheet.
3.	Select cells A1:E4.	These are the cells to be charted. The categories are listed along the X axis but could also be along the Y axis since you are comparing only one set of data.
4.	Click the <i>Insert Tab</i> on the ribbon.	
5.	In the Charts Group , click the [Insert Column or Bar Chart] button drop-down and choose the <i>Clustered Column</i> from the 2-D set of options.	A chart displaying the comparison with vertical bars is added to the spreadsheet.
6.	Move the chart under the data set.	With the chart actively selected move the cursor over the border to display the four headed move arrow cursor.
7.	Click the <i>Chart Tools Design Tab</i> .	The <i>Design Tab</i> tools are displayed in the ribbon.
8.	Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Column Chart category should be active. All the 2-D and 3-D Column Charts are displayed; Clustered, Stacked and 100% Stacked.
9.	Choose any of available Column Chart types and click the [OK] button.	The chart is changed. You can also double- click the chart type you want to apply it.
10	. Activate the <i>Column Multiple Series</i> worksheet.	By clicking the sheet tab at the bottom of the spreadsheet.



Instructions:	Results/ Comments:
11. Select cells A1:E8.	This is the data set to be charted. Notice there are categories along both axes.
12. Click the <i>Insert Tab</i> on the ribbon.	
13. In the Charts Group, click the [Insert Column or Bar Chart] button drop-down and choose the <i>Clustered Column</i> from the 2-D set of options.	The chart is added to the spreadsheet.
14. Move the chart under the data set.	Using the four sided arrow cursor.
15. Click the <i>Chart Tools Design Tab</i> .	
16. Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Column Chart category should be active. All the 2-D and 3-D Column Charts are displayed; Clustered, Stacked and 100% Stacked.
17. Choose any of available Column Chart types and click the [OK] button.	The chart is changed. You can also double- click the chart type you want to apply it.
18. Save the file and leave it open.	[CTRL + S].

0 Line Charts

Line Charts are used to display trends in relation to a common scale, and are therefore ideal for showing trends in data at equal intervals or over time. In a Line Chart, the horizontal axis displays category data and all value data is displayed evenly along the vertical axis.

If the first column of the data contains text labels, dates or a few numeric labels that are the category along the horizontal axis then use the Line Chart.



Line Charts, continued



When to Use a Line Chart

- If your category labels are text, and are representing evenly spaced values such as months, quarters, or fiscal years.
- If there are multiple series for one series, you should consider using a category chart.
- If you have a few evenly spaced numerical labels, especially years. If you have more than ten numerical labels, use a Scatter Chart instead.

Subtypes of Line Charts

Line and Line with Markers: Displayed with or without markers to indicate individual data values, Line Charts are useful to show trends over time or ordered categories, especially when there are many data points and the order in which they are presented is important. If there are many categories or the values are approximate, you should use a Line Chart without markers.



Stacked line and Stacked Line with Markers: Displayed with or without markers to indicate individual data values, stacked Line Charts are useful to show the trend of the contribution of each value over time or ordered categories. If there are many categories or the values are approximate, you should use a stacked Line Chart without markers.



Note For a better presentation of this type of data, you may want to consider using a Stacked Area Chart instead. Line Charts, continued

100% Stacked Line and 100% Stacked Line with Markers: Displayed with or without markers to indicate individual data values, 100% Stacked Line Charts are useful to show the trend of the percentage each value contributes over time or ordered categories. If there are many categories or the values are approximate, you should use a 100% Stacked Line Chart without markers.

Note For a better presentation of this type of data, you may want to consider using a 100% stacked Area Chart instead.



3-D line: 3-D Line Charts show each row or column of data as a 3-D ribbon. A 3-D Line Chart has horizontal, vertical, and depth axes that you can modify



Creating a Line Chart

Select the data to be charted, remember that the first column should contain either text, dates, or only a few numeric values (less than ten).

Month	Rain fall	Air Temp	Water level	Water Temp
Jan-06	2.0	28°	3.0	30°
Feb-06	1.0	38°	1.5	35°
Mar-06	2.0	55°	1.0	36°
Apr-06	2.7	60°	3.0	30°
May-06	3.0	65°	3.3	37°
Jun-06	2.8	75°	1.0	38°
Jul-06	2.8	80°	0.5	30°
Aug-06	1.0	90°	0.5	39°
Sep-06	2.4	70°	1.4	30°
Oct-06	3.3	50°	3.0	35°
Nov-06	1.0	42°	2.0	36°
Dec-06	2.8	45°	3.0	30°
Jan-07	2.0	25°	5.0	37°
Feb-07	6.0	32°	3.0	43°
Mar-07	3.0	45°	2.0	44°
Apr-07	4.0	50°	3.0	30°
May-07	5.0	55°	4.0	45°



0

Line Charts, continued

- Click on the *Insert Tab*.
- **♦** Locate the **Charts Group**.
- Click the [Insert Line or Area Chart] button dropdown and choose the type of Line Chart you wish to create.





Instructions:		Results/ Comments:
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Line and Scatter</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
3.	Select cells A1:B10 .	This is a data set that will create a single line Line Chart. The X axis is the data series while the Y axis is the category. The category for a Line Chart should be at regular intervals, time is a prime example since this type of chart is used to display trends in relation to a common scale
4.	Click the <i>Insert Tab</i> in the ribbon.	
5.	In the Charts Group , click the [Insert Line or Area Chart] button drop-down and choose <i>Line</i> (the first one). Move the chart beside the data.	The Line Chart is added to the spreadsheet. It shows the rainfall fluctuations over the span of days recorded within the data.
6.	Select cells A22:E39.	This data set tracks several categories of data across the X axis.
7.	Click the <i>Insert Tab</i> in the ribbon.	
8.	In the Charts Group , click the [Insert Line or Area Chart] button drop-down and choose <i>Line</i> from the set of options, the first one.	The Line Chart is added to the spreadsheet. It shows how each category's data fluctuates over the span of months recorded within the data.
9.	Click the <i>Chart Tools Design Tab</i> .	
10	. Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Line Chart category should be active. All the Line Charts are displayed; Line with and without markers, Stacked with and without markers, 100% stacked with and without markers, and 3-D Line.


Instructions:	Results/ Comments:
11. Choose any of available Line Chart types and click the [OK] button.	The chart type you chose is displayed.
12. Move the Chart to the right of your data.	
13. Try changing the chart type on the first Line Chart you made.	Repeat steps 9 through 11.
14. When you have found a chart type you like, save the file and keep it open.	[CTRL + S].

Scatter (XY) Charts

Scatter Charts, also referred to as XY charts, are used to find relationships between X and Y variables. Therefore, they always have two value axes, the horizontal axis draws it's values from the first column of data while the vertical axis is based on the values in the data. The data points are generated from the intersection of an x and y numerical values, these values are combined into single data points. Depending on the data, these data points may be distributed evenly or unevenly across the horizontal axis.



When to Use a Scatter Chart

- Solution If you want to change the scale of the horizontal axis.
- If you want to make that axis a logarithmic scale.
- ♦ I values for horizontal axis are not evenly spaced.
- Solution If there are many data points on the horizontal axis.
- If you want to effectively display worksheet data that includes pairs or grouped sets of values and adjust the independent scales of a Scatter Chart to reveal more information about the grouped values.
- If you want to show similarities between large sets of data instead of differences between data points.
- If you want to compare large numbers of data points without regard to time—the more data that you include in a Scatter Chart, the better the comparisons that you can make.

Scatter (XY) Charts, continued

Subtypes of Scatter Charts

Scatter: This type of chart compares pairs of values. Use a Scatter Chart without lines when you have data in a specific order.



Scatter with Smooth Lines and Markers and Scatter with Smooth Lines: This type of chart can be displayed with or without a smooth curve connecting the data points. These lines can be displayed with or without markers. Use the Scatter Chart without markers if there are many data points.



Scatter with Straight Lines and Markers and Scatter with Straight Lines: This type of chart can be displayed with or without straight connecting lines between data points. These lines can be displayed with or without markers.



Scatter (XY) Charts, continued

Creating a Scatter Chart

Select the data to be charted. There should be two columns of data and the first column should contain numeric data and will be the X (horizontal) axis.

Water Depth	Water Temp
10.0	30°
9.5	35°
9.0	36°
8.5	30°
8.0	37°
7.5	38°
7.0	30°
6.5	39°
6.0	30°
5.5	35°
5.0	36°
4.5	30°
4.0	37°
3.5	43°
5 U	AV0

Click the [Scatter Chart (X, Y), or Bubble Chart] button drop-down and choose the Scatter Chart you wish to use. The button is found in the Charts Group on the *Insert Tab*.



(0)

Scatter (XY) Charts, continued

While Scatter Charts and Line Charts can look similar, especially when a Scatter Chart is displayed with connecting lines, there is a big difference in the way each of these chart types plots data along the X (horizontal) axis and the Y (vertical) axis.

Use a Line Chart if you want to:	Use a Scatter Chart if you want to:
<i>Use text labels on the horizontal axis.</i> These text labels can represent evenly spaced values such as months, quarters, or fiscal years.	<i>Change the scale of the horizontal axis</i> Because the horizontal axis is a value axis, more scaling options are available.
<i>Use a small set of numerical labels on the horizontal axis.</i> <i>Useful to display a few, evenly spaced numerical labels that represent a time interval, such as years.</i>	<i>Use a logarithmic scale on the horizontal axis</i> Because the horizontal axis is a value axis, you can turn it into a logarithmic scale.
<i>Use a time scale along the horizontal axis</i> Useful to display dates in chronological order at specific intervals or base units, such as the number of days, months, or years, even if the dates on the worksheet are not in order or in the same base units.	Display worksheet data that includes pairs or grouped sets of values You can adjust the independent scales of the axes to reveal more information about the grouped values.
	<i>Show patterns in large sets of data</i> Useful for illustrating the patterns in the data, for example by showing linear or non-linear trends, clusters, and outliers.
	<i>Compare large numbers of data points without regard to time</i> The more data that you include in a Scatter Chart, the better the comparisons that you can make.



Instructions:		Results/ Comments:
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	The <i>Line and Scatter</i> sheet should also still be active.	If not then click the <i>Line and Scatter</i> sheet tab at the bottom of the spreadsheet.
3.	Select cells A43:B63.	This is the data set to be charted. For a Scatter Chart there should only be two columns or rows of data, the first column or row will be the X axis with the values should be in the second column or row. Unlike Line Charts, Scatter Charts don't need the X axis to be at regular intervals.
4.	Click the <i>Insert Tab</i> in the ribbon.	
5.	In the Charts Group , click the [Insert Scatter (X Y) or Bubble Chart] button drop-down and choose <i>Scatter</i> from the set of options, the first one.	The Scatter Chart is added to the spreadsheet.
6.	Move the Chart to the right of your data.	
7.	Click the <i>Design Tab</i> in the <i>Chart Tools</i> group of tabs.	
8.	Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Scatter Chart category should be active. All the Scatter Charts are available; markers only, smooth or straight line, both with or without markers.
9.	Choose any of available Scatter or Bubble Chart types and click the [OK] button.	Try each to see the variations. As you can see, the Bubble Charts are not good for this much data.
10	. Save the file and leave it open.	[CTRL + S].

Pie Charts

Note It is possible to make non-continuos selections from a larger data set to create Pie Charts. Pie Charts are used to show the contribution of each value (slice) proportionally to the sum of the items, the total (pie). Pie Charts always use one data series, the worksheet data should be arranged in either one column or one row. A column or row of category names can also be included, as long as they are in the first column or row in the selection. The categories will be presented as the legend of the Pie Chart while the data is displayed as percentages of the total.



Pie Chart based on continuos selection

Pie Chart based on non-continuos selection

When to Use a Pie Chart

- ♦ If you are plotting only one *Data Series*.
- Solution If no negative values are in the *Data Series*.
- If the values you are plotting have few zeros in the Data Series.
- If you have seven or less categories to chart although, you can still make a Pie Chart from larger data sets.
- If the categories can be represented as part of the whole pie.



Subtypes of Pie Charts

Pie and Pie in 3-D: Pie Charts display the contribution of each value to a total in a 2-D or 3-D format. You can pull out slices of a Pie Chart manually to emphasize the slices.



Pie of Pie and Bar of Pie: Pie of Pie or Bar of Pie Charts display Pie Charts with user-defined values that are extracted from the main Pie Chart and combined into a secondary Pie Chart or into a stacked bar chart. These chart types are useful when you want to make small slices in the main Pie Chart easier to distinguish.



Pie Charts, continued

Creating a Pie Chart

- Select the data to be charted.
 - Remember that Pie Charts only plot one data series so the selection should be at most either two rows or columns. One of which contains the headers and the other the data.
 - You can make non-continuos selections from larger data sets as long as one contains the headers and the other the data

	2005	2006	2007	2008	2009	2010
Anover	\$5,236.00	\$5,497.80	\$5,759.60	\$6,021.40	\$6,283.20	\$6,545.00
Dover	\$13,579.00	\$14,257.95	\$14,869.01	\$15,547.96	\$16,498.49	\$17,177.44
Clover	\$7,158.00	\$7,515.90	\$4,586.00	\$4,943.90	\$5,301.80	\$5,659.70
Grover	\$3,571.00	\$3,749.55	\$4,070.94	\$4,249.49	\$6,034.99	\$2,784.00
Nover	\$8,207.33	\$8,617.70	\$9,028.07	\$9,438.43	\$9,848.80	\$8,617.70
Prover	\$9,168.33	\$9,626.75	\$10,085.17	\$11,002.00	\$11,231.21	\$11,689.63

	2005	2006	2007	2008	2009	2010
Anover	\$5,236.00	\$5,497.80	\$5,759.60	\$6,021.40	\$6,283.20	\$6,545.00
Dover	\$13,579.00	\$14,257.95	\$14,869.01	\$15,547.96	\$16,498.49	\$17,177.44
Clover	\$7,158.00	\$7,515.90	\$4,586.00	\$4,943.90	\$5,301.80	\$5,659.70
Grover	\$3,571.00	\$3,749.55	\$4,070.94	\$4,249.49	\$6,034.99	\$2,784.00
Nover	\$8,207.33	\$8,617.70	\$9,028.07	\$9,438.43	\$9,848.80	\$8,617.70
Prover	\$9,168.33	\$9,626.75	\$10,085.17	\$11,002.00	\$11,231.21	\$11,689.63

Select the *Insert Tab* and location the Charts Group. Click the [Insert Pie or Donut Chart] button dropdown and choose the Pie Chart you wish to use.







Connector lines are added automatically. You can remove them or change the connector styles.

Creating a Pie in Pie Chart

- Select the data to be charted.
 - The lesser values should be at the bottom of the data list but this is not necessary since you can edit this once the chart is created.
- Click the [Insert Pie or Doughnut Chart] button dropdown and choose *Pie of Pie* from the menu.

Changing to a Pie of Pie Chart

- Select the Pie Chart and click the [Change Chart Type] button on the Design Tab.
- Image: Constraint of the second s
- Choose the Pie of Pie or Bar of Pie.

Editing the Secondary Pie or Bar

- Right-click the pie or bar and choose *Format Data Series* from the menu.
- In the Format Data Series dialog, click the type of data to display in the secondary chart form Split Series By field drop-down.
- To change how many data points appear in the secondary chart, make adjustments to the Values in second plot field.
- Use Pie Explosion to separate (explode) the slices of the pie.
- Gap Width controls the amount of space between the Pie Chart and the secondary chart.
- Second Plot Size controls the size of the secondary chart.



I	nstructions:	Results/ Comments:
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Pie</i> sheet.	Click the <i>Pie</i> sheet tab at the bottom of the spreadsheet.
3.	Select cells A1:B7 .	This is the data set to be charted. The Pie Chart will create a chart where all of the data points will be compared to each other as a cumulative total. For a Pie Chart there should only be two columns or rows of data, the first column or row will be the X axis with the values should be in the second column or row. This data structure is similar to the Scatter Chart data structure. If the data set has more than two rows or columns and you want to still create a Pie Chart to examine only part of the data, select only the first row or column and hold the [CTRL] key while selecting the second set of cells containing values.
4.	Click the <i>Insert Tab</i> in the ribbon.	
5.	In the Charts Group , click the [Insert Pie or Doughnut Chart] button drop- down and choose <i>Pie</i> from the 2-D set of options, the first one.	The Pie Chart is added to the spreadsheet.
6.	Move the Pie Chart below the data set.	Position the cursor over the edge of the active chart, when the four headed arrow move cursor appears you can click and drag it to it's new location.
7.	Click the <i>Chart Tools Design Tab</i> .	



Instructions:	Results/ Comments:
8. Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Pie Chart category should be active. All the Pie Charts are available; Pie, 3-D Pie, Pie of Pie, Bar of Pie and Doughnut.
9. Choose any of available Pie Chart types and click the [OK] button.	Try each to see the variations.
10. Save the file.	[CTRL + S].
11. Select cells A1:A7 and C1:C7 .	Select the first range of cells that contain the categories for the chart. Hold the [CTRL] key and select the second set of cells that contain the values. This is a noncontinuous selection from a larger data set where you want to create a Pie Chart.
12. Click the <i>Insert Tab</i> in the ribbon.	
13. In the Charts Group , click the [Insert Pie or Doughnut Chart] button drop-down and choose any <i>Pie</i> .	The second Pie Chart is added to the spreadsheet.
14. Move the new Pie Chart below the first one.	
15. Save the file.	[CTRL + S].
16. Select cells N2:O8 .	These are the cells you will use for a Pie of Pie Chart.
17. Click the [Insert Pie or Doughnut Chart] button drop-down and choose Pie of Pie from the menu.	The chart is added to the spreadsheet.
18. Move the chart under the data so it does not overlap the existing Pie Chart and examine how the chart is set up.	The three smaller amount have been combined into a single wedge in the main chart and the secondary chart shows how those three from the single in the main chart.



Instructions:	Results/ Comments:
19. Right-click the secondary chart and choose <i>Format Data Series</i> from the menu.	The <i>Format Data Series</i> pane opens with the <i>Series Options</i> category displayed.
20. Click the drop-down for the Split Series By field and choose <i>Percentage Value</i> .	
21. Change the value from 10% to 15% in the Values less than field.	The Ink data point is now included in the secondary plot.
22. Click the drop-down for the Split Series By field and choose <i>Position</i> .	The secondary plot goes back to the default of 3 positions. The default is not always three positions, it is relative to the values of each data point the charts is drawing from.
23. Change the value from 3 to 2 in the Values in second plot field.	The secondary plot now show the Flash Drives and Cables data points.
24. Change the value from 2 to 3 in the Values in second plot field.	The Secondary plot is back to it's original state.
25. In the <i>Format</i> pane, click the [Close] button.	The <i>Format</i> pane closes.
26. Save the file and leave the file open.	[CTRL + S].

Orea Charts

An Area Chart is essentially a Line Chart where the areas below the lines filled with colors. Area Charts emphasize the magnitude of change over time, and can be used to draw attention to the total value across a trend. In this chart type, the horizontal axis is based on the text values in either the first row or column and the vertical axis is based on the values in the columns.



Area Chart using data in vertical configuration



Area Chart using data in vertical configuration

When to Use an Area Chart

- Since these chart types are similar to Line Charts, consider the same reason as mentioned in the Line Chart section of this lesson.
- Solution If you want to show rough part-to-whole comparisons.



Area Charts, continued

Subtypes of Area Charts

Area and 3-D Area: Area Charts display the trend of values over time or categories. A 3-D Area displays the same but presents the areas in a 3-D format. To present data in a 3-D format that uses three axes (horizontal, vertical, and depth axes) that you can modify, you should use the 3-D Area Chart subtype. As a general rule, you should consider using a Line Chart instead of a non-stacked Area Chart.



Stacked Area and 3-D Stacked Area: Stacked Area Charts display the trend of the contribution of each value over time or categories. A 3-D Stacked Area Chart displays the same but presents the areas in a 3-D format. To present data in a 3-D format that uses three axes (horizontal, vertical, and depth axes) that you can modify, you should use the 3-D Area Chart subtype.





Area Charts, continued

100% Stacked Area and 3-D 100% Stacked Area: 100% stacked Area Charts display the *trend of the percentage each value contributes over time or categories*. A 100% stacked Area Chart in 3-D displays the same but presents the areas in a 3-D format; it does not display the data in 3-D format. To present data in a 3-D format that uses three axes (horizontal, vertical, and depth axes) that you can modify, you should use the 3-D Area Chart subtype.



Creating an Area Chart

Select the data to be charted. The header text can be in the first row or column, not recommended to have headers for both.

Columbus 2:	17,047	207,740	130,942	165,678	117,634	94,567
Montreal 12	29,870	152,144	78,730	269,108	143,538	217,968
New York 1	74,850	83,568	86,895	217,047	207,740	130,942
San Francisco 12	25,678	157,634	104,567	108,182	97,627	87,071
Chicago 2:	16,992	165,678	217,968	185,774	209,903	219,951
Washington 1	54,635	269,108	267,550	245,006	236,453	224,402
Seattle 18	85,774	217,047	333,086	304,238	237,534	268,906
Hong Kong 24	45,006	108,182	398,623	363,470	257,375	310,558
London 19	98,955	169,269	464,159	422,702	277,217	351,558
Paris	85,655	164,516	529,696	481,934	297,058	392,883
Bonn 43	36,991	159,762	595,232	541,166	316,889	224,209

- Select the *Insert Tab* and locate the **Charts Group**.
- Click the **[Insert Line or Area Chart]** button dropdown and choose the Area Chart you wish to use.







Iı	nstructions:	Results/ Comments:
1.	MyCharts.xlsx should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Area</i> sheet.	Click the <i>Area</i> sheet tab at the bottom of the spreadsheet.
3.	Select cells A1:K7 .	This is the data set to be charted. Area Charts are similar to Line Charts with the addition of filled space below the line, as such the structure of the data is the same as that of a Line Chart. The headers can be in either the first row (X) or the first column (Y), although <i>you should not have</i> <i>headers running in both the X and Y axes.</i>
4.	Click the <i>Insert Tab</i> in the ribbon.	
5.	In the Charts Group , click the [Insert Line or Area Chart] button drop-down and choose <i>Area</i> from the 2-D set of options, the first one.	An Area Chart is added to the spreadsheet.
6.	Move the Area Chart below the data set.	Position the cursor over the edge of the active chart, when the four headed arrow move cursor appears you can click and drag it to it's new location.
7.	Reselect the data set and copy it.	You will be creating another Area Chart from the same data but structured with the categories in the first column.
8.	Select cell A30.	This is where the data is to be placed.
9.	Right-click the cell, then from the <i>Paste</i> option, choose <i>Transpose</i> (The 4th Paste option).	The data set contains the same informatio but is configured with the categories in th first column.
10	. Select cells A30:G40.	This is the data set to be charted again.
11	. Click the <i>Insert Tab</i> in the ribbon.	You will create another chart.



Instructions:	Results/ Comments:
12. In the Charts Group , click the [Insert Line or Area Chart] button drop-down and choose <i>Area</i> from the 2-D set of options, the first one.	The second chart is added to the spreadsheet. Notice that even though the data structure was transposed the chart is just like the first chart you created.
13. If not already selected, click the <i>Chart Tools Design Tab</i> .	
14. Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Area Chart category should be active. All the Area Charts are available; Area, Stacked Area, and 100% Stacked both in 2-D and 3-D.
15. Choose any of available Area Chart types and click the [OK] button.	Try each to see the variations.
16. Move the chart to the right of your first chart.	
17. Save the file and leave it open.	[CTRL + S].

0

Bubble Charts

The Bubble Chart is a variation of a Scatter Chart where data points are replaced with bubbles that visually emphasize specific values. The size of the bubbles adds an additional dimension to the data. Like a Scatter Chart, a Bubble Chart does not use a category axis, both horizontal and vertical axes are value axes. The Bubble Chart plots X and Y values but adds a Z (size) to the values. Use a Bubble Chart instead of a Scatter Chart when your data has three data series, each containing values sets. The values in the third data series are used to determine the bubble sizes.



When to Use a Bubble Chart

- If there are three values per data point. These values can be in rows or columns on the worksheet, but they must be in the following order: x value, y value, and then Z value.
- If there are multiple data series to be plotted. Scatter Charts use sets of x values and y values, but Bubble Charts use sets of x values, y values, and Z values.



Subtypes of Bubble Charts

Bubble and 3-D Bubble: Bubble Charts are similar to XY (Scatter) chart, but they compare sets of three values instead of two. The third value determines the size of the bubble marker. You can choose a bubble or a 3-D Bubble Chart subtype.



Creating a Bubble Chart

- Select the data to be charted.
 - Remember that Pie Charts only plot one data series so the selection should be at most either two rows or columns. One of which contains the headers and the other the data.

# of Products	Sales	Market Share %
14	\$12,200.00	15%
20	\$60,000.00	33%
18	\$24,400.00	10%
22	\$32,000.00	42%

- Select the *Insert Tab* and locate the **Chart Group**.
- Click the [Insert Scatter (X Y) or Bubble Chart] button drop-down and choose the Bubble Chart you wish to use.





I	nstructions:	R	Results/ Comments:
1.	MyCharts.xlsx should still be open.	If fc	not, re-open the file from the data files older.
2.	Activate the <i>Bubble</i> sheet.	C th	Click the <i>Bubble</i> sheet tab at the bottom of ne spreadsheet.
3.	Select cells A1:C5 .	T. B' ir fi: th B' th	This is the data set to be charted. The subble Chart is similar to a Scatter Chart in the way it located the points, using the rst two columns. Unlike a Scatter Chart hat can only use two columns of data, the subble uses a third column to determine he size of the bubbles.
4.	Click the <i>Insert Tab</i> in the ribbon.		
5.	In the Charts Group , click the [Insert Scatter (X Y) or Bubble Chart] button drop-down, from the <i>Bubble</i> set choose the first one.	A sp co ea th bu m	Bubble Chart is added to the preadsheet. In this case the <i>Market Share</i> olumn is used to determine the size of ach bubble. It is a good idea to have the nird columns values total 100% so the ubble sizes display their relationship nore accurately.
6.	The <i>Chart Tools Design Tab</i> should already be selected, if not, select it.		
7.	Click the [Change Chart Type] button.	T. w of ca	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any ther type of chart. The Bubble Chart ategory only offers a 2-D and 3-D version f the chart.
8.	Choose the 3-D Bubble Chart variation and click the [OK] button.	T	he chart is changed.
9.	Save the file and leave it open.	[(CTRL + S].

Doughnut Charts

Doughnut Charts show the relationship of parts to a whole, like a Pie Chart **but it can contain more than one data series**. Data that is arranged in columns or rows only on a worksheet can be plotted in a Doughnut Chart. The first data set will be placed in the inner ring of the doughnut.



Due to the circular nature of Doughnut Charts; they can be difficult to read, especially when displaying multiple data series. The proportions of outer rings and inner rings do not represent the size of the data accurately, data points on outer rings may appear larger than data points on inner rings while their actual values may be smaller. It is useful to displaying values or percentages data labels in a Doughnut Chart. When you want to compare the data points side by side, consider a stacked column or stacked bar chart instead.

When to Use a Doughnut Chart

- ♦ If you have one or more data series to be plotted.
- If none of the values that you want to plot is negative.
- ♦ If none of the values are a zero (0) value.
- ♦ If there are less than seven categories per data series.
- If the categories represent parts of whole in each ring of the Doughnut Chart.

Subtypes of Doughnut Charts

Doughnut: Doughnut Charts display data in rings, where each ring represents a data series.



Exploded Doughnut: Much like exploded Pie Charts, exploded Doughnut Charts display the contribution of each value to a total while emphasizing individual values, but they can contain more than one data series. Like Pie Charts, to explode a Doughnut Chart, you use the *Format Data Series* panel.



Creating a Doughnut Chart

Select the data to be charted. Remember that Doughnut Chart will place the first data series in the inner ring with each data series forming the next ring.

Product	North	South	East	West
Conduit	1,200	450	500	401
Pipe	2,200	2,000	700	1,400
Elbows	1,500	2,356	200	700
Joints	1,000	2,500	500	1,400
Fittings	1,600	1,860	400	500

Doughnut Charts, continued

Ooughnut Charts, continued

- Click the *Insert Tab* and locate the **Charts Group**.
- Click the [Insert Pie or Doughnut Chart] button dropdown and choose the Doughnut Chart at the bottom or the drop-down.





Iı	nstructions:	Results/ Comments:
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Doughnut</i> sheet.	Click the <i>Doughnut</i> sheet tab at the bottom of the spreadsheet.
3.	Select cells A1:E7 .	This is the data set to be charted. Doughnut Charts are similar to Pie Charts but can plot multiple series of data unlike a Pie that only plots one. The structure of the data can be arranged vertically or horizontally. The first row or column of data will be used to create the inner ring of the doughnut and each subsequent row or column will create the next ring outward.
4.	Click the <i>Insert Tab</i> in the ribbon.	
5.	In the Charts Group , click the [Insert Pie or Doughnut Chart] button drop-down, from the <i>Doughnut</i> set choose the only one available.	A Doughnut Chart is added to the spreadsheet. Each ring represents a cumulative total of the row or column it is based on, much like a Pie Chart does.
6.	Click the <i>Chart Tools Design Tab</i> .	
7.	Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Doughnut Chart category only offers the Doughnut Chart with two versions which switches the data series used.
8.	Choose the <i>Doughnut</i> Chart on the right and click the [OK] button.	The chart is changed.
9.	Explode the Chart using the <i>Format Chart Area</i> pane.	<i>Right-click</i> the chart and choose Format Data Series . Only the outer data series can be exploded.
10	. Save the file and leave it open.	[CTRL + S].

Stock Charts

Data that is arranged in columns or rows in a specific order on a worksheet can be plotted in a Stock Chart. As its name implies, a Stock Chart is most often used to illustrate the fluctuation of stock prices. There are four variations to the Stock Chart and the arrangement of the data is different for each and must be respected, if the data is not configured correctly *Excel* will display and Information window explaining how the data must be configured.



However, this chart may also be used for scientific data. For example, you could use a Stock Chart to indicate the fluctuation of daily or annual temperatures. You must organize your data in the correct order to create Stock Charts.

The way Stock Chart data is organized in your worksheet is very important. For example, to create a simple high-low-close Stock Chart, you should arrange your data with High, Low, and Close entered as column headings, in that order.

Subtypes of Stock Charts

High-Low-Close: The high-low-close chart is often used to illustrate stock prices. It requires three series of values in the following order: high, low, and then close.





Stock Charts, continued

Open-High-Low-Close: This type of chart requires four series of values in the correct order (open, high, low, and then close).



Volume-High-Low-Close: This type of chart requires four series of values in the correct order (volume, high, low, and then close). It measures volume by using two value axes: one for the columns that measure volume, and the other for the stock prices.



Volume-Open-High-Low-Close: This type of chart requires five series of values in the correct order (volume, open, high, low, and then close).



0)		
	Stock	Charts,
	continue	d

Creating a Stock Chart

- Arrange your data according to the type of Stock Chart you want to create.
- Select the data.
- Click on the *Insert Tab*.
- Click the [Insert Waterfall, Funnel, Stock, Surface, or Radar Chart] button drop-down and choose the desired Stock Chart from the drop-down.



- OR -

- Click the [Recommended Charts] button. The Insert Chart dialog box is displayed.
- Choose Stock from the chart list on the left of the dialog.
- Choose the chart you wish to use.





I	nstructions:	Results/ Comments:		
1.	MyCharts.xlsx should still be open.	If not, re-open the file from the data files folder.		
2.	Activate the <i>Stock</i> sheet.	Click the <i>Stock</i> sheet tab at the bottom of the spreadsheet.		
3.	Select cells A1:D14.	This is the data set to be charted. Even though the data set could be much larger, for these examples we will use only a small selection. The variations of the Stock Charts require the data to be structured in a very specific manner. Creating a High, Low, Close Stock Chart must have the four columns of data: the first should contain either the scale for the chart or the stock names, the second column contains the high values, the third contains the low values, and the last contains the closing values. If the structure is not correct <i>Excel</i> will display an <i>Information</i> window explaining why it can not create the chart.		
4.	Click the <i>Insert Tab</i> in the ribbon.			
5.	In the Charts group click the [Recommended Charts] button to display the Insert Chart dialog. Click the <i>All Charts</i> tab. Select <i>Stock</i> from list of choices. From the <i>Stock</i> set choose the first one.	The High, Low, Close Stock Chart is added to the spreadsheet. The data in the first column is used as the Y axis on the chart and the remaining columns of data are used to plot the chart itself.		
6.	Click [OK] . Move the Chart to the right of the data.			
7.	Select cells M1:P14 .	Creating the Open, High, Low, Close Stock Chart must have the five columns of data: the first should contain either the scale for the chart or the stock names, the second column contains the open values, the third contains the high values, the fourth contains the low values, and the last contains the closing values.		



Instructions:

- 8. Click the *Insert Tab* in the ribbon.
- 9. In the **Charts group** click the **[Recommended Charts]** button to display the **Insert Chart** dialog. Click the *All Charts* tab. Select *Stock* from list of choices. From the *Stock* set choose the Open-High-Low-Close Chart.
- 10. Click [Cancel].
- 11. Select cells M1:AQ14.
- 12. Click the *Insert Tab* in the ribbon.
- 13. In the **Charts group** click the [Recommended Charts] button to display the Insert Chart dialog. Click the *All Charts* tab. Select *Stock* from list of choices. From the *Stock* set choose the Open-High-Low-Close Chart.
- 14. Click the **[OK]** button.
- 15. Save the file and leave it open.

Results/ Comments:

The **[OK]** button is greyed out. This is due to the fact the selection does not include enough data to create this type of Stock Chart.

The *Insert Charts* dialog closes.

Now the selection contains enough data in the correct configuration to enable a preview and the **[OK]** button is active, allowing you to utilize this type of chart.

The chart is added to the file.

[CTRL + S].

Surface Charts

Surface Charts are used to show how a set of data points are connected in a three-dimensional surface. Think of them as topographic maps of your data. Consider how map grids are created, the X (horizontal) axis uses letters or numbers as does the Y (vertical) axis. Where they intersect is the data point to be plotted on the Z (height) axis, the values being plotted have to be uniformly spaced along the X and Y axes. You can't have arbitrarily spaced data as you can in XY scatter plots. This structure is the same as the way Excel organizes spreadsheets with rows, columns, and cells. The data headers should not be text since text is ignored by the Surface Chart, both categories and data series should be numeric values.

Like topographic maps, the colors and patterns in a Surface

Locatio point alc Axis of t	n of the ong the Y the chart		Lo alo	cation of ong the X of the ch	point Axis art		
				•			
	1	2	3	4	5	6	7
1	14	11	8	5	2	10	17
2	18	15	12	9	6	3	8
3	20	23	26	29	32	35	38
4	13	21	29	37	45	53	61
5	21	14	7	9	11	18	20
6	17	19	21	23	25	27	29
7	25	18	11	4	12	16	15
			Z Axis	s, data po	ints		
			that det	ermine h	eight		

Chart indicate areas that contain the same range of values. Unlike other chart types, a Surface Chart does not use colors to distinguish the data series, values are distinguished by colors. To enhance a Surface Chart, you can change the colors and use transparency to display color bands that are obscured in the back of the chart.





Chart Subtypes for Surface Charts

3-D surface: 3-D Surface Charts show trends in values across two dimensions in a continuous curve. Colors in a Surface Chart do not represent the data series; they represent the distinction between the values.



Wireframe 3-D Surface: Displayed without color, a 3-D Surface Chart is called a wireframe 3-D Surface Chart.



Contour and Wireframe Contour: Contour and wireframe contour charts are Surface Charts viewed from above. In a contour chart, colors represent specific ranges of values. A wireframe contour chart is displayed without color.



0

Surface Charts, continued

Creating Surface Charts

Select the data to be plotted.

	1	2	3	4	5	6	7
1	14	11	8	5	2	10	17
2	18	15	12	9	6	3	8
3	20	23	26	29	32	35	38
4	13	21	29	37	45	53	61
5	21	14	7	9	11	18	20
6	17	19	21	23	25	27	29
7	25	18	11	4	12	16	15

- Select the *Insert Tab* and **Charts Group**.
- Click the [Recommended Charts] button. The Insert Chart Dialog is displayed.



Click the *All Charts Tab* and select **Surface** from the list of chart types on the left of the dialog.





Instructions:			Results/ Comments:		
1.	MyCharts.xlsx file should still be open.		If not, re-open the file from the data files folder.		
2.	Activate the <i>Surface</i> sheet.		Click the <i>Surface</i> sheet tab at the bottom of the spreadsheet.		
3.	Select cells A3:H10.		This is the data set to be charted. The Surface Chart structure requires the first row and column of the data set to create a grid pattern, the data is used to determine the height at which each data point is set on the grid.		
4.	Click the <i>Insert Tab</i> in the ribbon.				
5.	In the Charts Group, click the [Recommended Charts] button.		A Surface Chart is added to the spreadsheet. The X and Y axes represent the grid pattern held in the first row		
	Select the <i>All Charts Tab</i> and click <i>Surface</i> from the list at the left.		and column of the data set (never use text headers for this type of chart). The elevations of the chart are based on where		
	Click on the 3-D Surface option.		the data point intersects the grid. The legend in this chart does not reflect any		
	Click [OK] and move the chart below the data.		series of data but rather the elevation levels of the chart.		
6.	Click the <i>Chart Tools Design Tab</i> .				
7.	Click the [Change Chart Type] button.		The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Surface Chart category should be active, where you can choose from 3-D surface, wireframe 3-D surface, contour, or wireframe contour options.		
8.	Choose the <i>Wireframe 3-D Surface</i> Chart variation and click the [OK] button.		The chart is changed. Try viewing each of the variations.		
9.	Save the file and leave it open.		[CTRL + S].		

Radar Charts

Radar Charts, also referred to as a spider or star charts because of its appearance, plots the values of each category along a separate axis that starts in the center of the chart and ends on the outer ring. Concentric lines connect each spoke and make up the units of measurement and each point is plotted for each variable on the spokes, they are then connected with lines. Data that is arranged in columns or rows on a worksheet can be plotted in a Radar Chart.



Subtypes of Radar Charts

Radar and Radar with Markers: With or without markers for individual data points, Radar Charts display changes in values relative to a center point.



• **Filled Radar:** In a filled Radar Chart, the area covered by a data series is filled with a color.



Creating Radar Charts

Select the data to be plotted.

	Bulbs	Seeds	Flowers	Trees & shrubs	
Jan	0	2500	500	0	
Feb	0	5500	750	1500	
Mar	0	9000	1500	2500	
Apr	0	6500	2000	4000	
May	0	3500	5500	3500	
Jun	0	0	7500	1500	
Jul	0	0	8500	800	
Aug	1500	0	7000	550	
Sep	5000	0	3500	2500	
Oct	8500	0	2500	6000	
Nov	3500	0	500	5500	
Dec	500	0	100	3000	

- Select the *Insert Tab* and locate the **Charts Group**.
- Click the [Insert Waterfall, Funnel, Stock, Surface or Radar Chart] button drop-down and choose the Radar Chart you wish to use.




Instructions:		Results/ Comments:		
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.		
2.	Activate the <i>Radar</i> sheet.	Click the <i>Radar</i> sheet tab at the bottom of the spreadsheet.		
3.	Select cells A3:E13.	This is the data set to be charted. The Radar Chart structure can be arrange with the headers running along both rows and columns, with the upper left corner left blank. If the is something in that cell then the chart tries to incorporate it as a data series within the chart.		
4.	Click the <i>Insert Tab</i> in the ribbon.			
5.	In the Charts Group , click the [Insert Waterfall , Funnel , Stock , Surface or Radar Chart] button drop-down, from the <i>Radar</i> set choose the first one. Move the chart below the data.	A Radar Chart is added to the spreadsheet. Each data series creates a ring around the center of the chart.		
6.	Click the <i>Chart Tools Design Tab</i> .			
7.	Click the [Change Chart Type] button.	The <i>Change Chart Type</i> dialog is displayed where you can change the chart to any other type of chart. The Radar Chart category should be active, where you can choose from radar, radar with markers, or filled radar options.		
8.	Choose <i>Radar with Markers</i> chart variation and click the first option, then click the [OK] button.	The chart is changed. Try viewing each of the variations.		
9.	Save the file and leave it open.	[CTRL + S].		

Funnel Charts

When you want to see how stages in a process compare to each other , then a Funnel Chart is a great option. This type of chart shows the process steps in a stacked and descending , as values decrease during each phase or step in a process the overall appearance of the chart takes on the shape of a funnel.



Data should be structured in two columns to use a Funnel Chart. The first column containing the steps in the process while the second contains the values associated with each phase.

565
400
287
89
53
25
10

Creating A Funnel Chart

- Select the data.
- Select the *Insert Tab* and locate the **Charts Group**.
- Click the [Insert Waterfall, Funnel, Stock, Surface or Radar Chart] button drop-down and choose the *Radar* Chart you wish to use.



Waterfall Charts

Visualizing a series of values as a running total, use the Waterfall Chart. This chart type can show the values as a diminishing total (Waterfall) or an arch (Bridge).



Both types of this chart illustrate how an initial value is impacted by subsequent positive and negative values with a final resulting total. In both cases the first and last rows should contain a starting and ending value, the rows between can contain additions (positive values) and subtractions (negative values). When a Waterfall type is desired, include rows after each addition or substraction that determine the current value. Waterfall data set

Total	\$200.00		Original Value
Expense 1	-\$35.00	←	Negative Value, formatted as negative
Profit margin 1	\$165.00	←	Formula adding values 1 & 2
Expense 2	-\$20.00	←	Negative Value, formatted as negative
Fianl profit	\$145.00	←──	Formula adding values 3 & 4

Bridge data set



Creating a Waterfall Chart

- ۲ Select the data set.
- Select the *Insert Tab* and locate the **Charts Group**. ۲
- Click the [Insert Waterfall, Funnel, Stock, Surface ۲ or Radar Chart] button drop-down and choose the Waterfall Chart.
- ۲ The initial Waterfall Chart is inserted.



Waterfall Charts, continued

Note Clicking once on a column will select the entire data series, it is the second click that allows you to select a data point within the series.

Formatting the Waterfall Chart

Once the initial chart has be inserted, it needs to be formatted to complete the process of creating a Waterfall chart. Data points which represent the total and running totals need to be set as total, this will stop them from being floating columns and have them start from zero on the horizontal axis.

- Click the first column in the chart twice to select the data point.
- If you are not planning to make other changes to the formatting of the chart, then right-click the data point and choose to *Set as Total* directly from the menu.
- If you are planning to make other formatting changes then, right-click the selected data point and choose *Format Data Point* from the menu.



- Solution In the *Format* pane, click the **[Series Option]** button.
- Check the **Set as total** checkbox.
- Click each column representing a running total and set it as a total also.

Formatting the Bridge Chart

Once the initial chart has be inserted, it needs to be formatted to complete the process of creating a Bridge chart. The final data point in the series needs to be set as a total. This will stop it from floating and make it start from zero on the horizontal axis, creating an arched bridge appearance to the charted data.

- Click the last data point in the series twice to select it.
- Right-click the data point and choose Set as Total from the menu.
- Should other aspects of the chart require formatting, choose *Format Data Point* form the menu.
- Use the *Format Data Point* pane to set As Total.

0

Waterfall Charts, Showing or Hiding Connector Lines

- Solution Click on a column in the chart to select the data series.
- Right-click the data series and choose *Format Data Series* from the menu.
- In the *Series Options* check or uncheck the Show connector lines checkbox.
- Switch the the *Fill & Line* formatting tools and apply *Border* formatting to customize the connectors.



Instructions:			Results/ Comments:		
1. My	y Charts.xlsx file should still be open.		If not, re-open the file from the data files folder.		
2. Ac	tivate the <i>Funnel</i> sheet.		Click the <i>Funnel</i> sheet tab at the bottom of the spreadsheet.		
3. Sel	ect cells A3:B9 .		The top value in this data set is a cumulative starting value for the chart. The remaining values represent diminishing values associated with each step in a process.		
4. Cli	ick the <i>Insert Tab</i> in the ribbon.				
5. In Wa Ra <i>Fun</i> the	the Charts Group , click the [Insert iterfall , Funnel , Stock , Surface or dar Chart] button drop-down, choose <i>nnel</i> from the menu. Move the chart to e right of the data.		The Funnel chart is added to the sheet.		
6. Sel	ect cells A20:B24 .		This data set shows a total value in the top position with negative values and running totals of the first value in relation to the negatives.		
7. Cli	ick the <i>Insert Tab</i> in the ribbon.				
8. In Wa Wa Wa to t	the Charts Group , click the [Insert aterfall , Funnel , Stock , Surface or dar Chart] button drop-down, choose <i>aterfall</i> from the menu. Move the chart the right of the data.		The Waterfall chart is added to the sheet but still requires a few modifications to be completed.		
9. Sel	ect the first data point in the series.		Click the first bar in the chart twice.		
10. Rig <i>For</i>	ght-click the data point and choose <i>rmat Data Point</i> from the menu.		The <i>Format</i> pane opens with the Series options active.		
11. Ch	eck the Set as total checkbox.		This ensure that data point begins at the bottom of the horizontal axis.		



Instructions:	Results/ Comments:
12. Select the next positive vale data point on the chart.	Simply click the next blue shape in the chart.
13. In the <i>Format</i> pane, check the Set as total checkbox.	This again sets the data point's starting position as zero on the horizontal.
14. Set the last positive value data point as a total.	Repeat steps 12 and 13.
15. Close the <i>Format</i> pane.	
16. Select cells A30:B33 .	This data will be used to create a Bridge chart.
17. In the Charts Group , click the [Insert Waterfall , Funnel , Stock , Surface or Radar Chart] button drop-down, choose <i>Waterfall</i> from the menu. Move the chart to the right of the data.	The initial Waterfall chart is inserted.
18. Select the last data point in the series.	The first click will select the entire data series, the second click will select the individual data point from within the series.
19. Right click the last data point and choose <i>Set as Total</i> from the menu.	The data point is re-positioned to begin from the zero point on the horizontal axis.
20. Save the file and leave it open.	[CTRL + S].

Box and Whiskers Charts

The Box and Whisker Chart shows four aspects of the data; high point, low point, a median range, and the mid point. This type of chart lends itself to presenting statistical analysis of data sets, you will often see it used to present comparative testing results.

To better understand the Box and Whisker Chart, look at the example diagrammed below.



- The *Box*: represents the mean within the data set, representing 50% of the data set, distributed between the 1st and 3rd quartiles.
- The *Median*: divides the box into the second and third quartile ranges.
- Top Whisker: shows the highest outlying value in the data set.
- Sottom Whisker: shows the lowest outlying value from the data set.
- *Quartiles*: are the results of taking the range of values from low to high in account with the number of data points within the data set broken into quarters.

Creating A Box and Whisker Chart

- Select the data set.
- Select the *Insert Tab* and locate the **Charts Group**.
- Click the [Insert Statistic Chart] button drop-down and choose the *Box and Whisker* Chart.





0

Box and Whiskers Charts, continued

The initial Box and Whisker Chart is inserted.



Formatting the Data Series

- Right-click a data series in the chart.
- Choose *Format Data Series* from the menu.



In the *Format Data Series* pane turn on or off elements from the series with the checkboxes. (Each series will have to be handled individually.)

Listed below is an explanation of the series options:

Series Options	Description of Option
Gap width	Controls spacing between categories.
Show inner points	Displays data points lying between the lower and upper whisker line.
Show outlier points	Displays outlier points lying either below or above whisker line.
Show mean markers	Displays mean marker of the series.
Show mean line	Displays a line connecting the means of the selected series.
Quartile Calculation	Choose a method of median calculation:
Inclusive median:	Median is included in the calculation if N (the number of values in the data) is odd.
Exclusive median:	Median is excluded from the calculation if N (the number of values in the data) is odd



Instructions:		Results/ Comments:		
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.		
2.	Activate the <i>Box&Whisker</i> sheet.	Click the <i>Box&Whisker</i> sheet tab at the bottom of the spreadsheet.		
3.	Select cells A1:D33.	Select any cell with a value, use the [Ctrl + A] short to select all connected data.		
4.	Click the <i>Insert Tab</i> in the ribbon.			
5.	In the Charts Group , click the [Insert Statistic Chart] button drop-down, choose <i>Box and Whisker</i> from the menu. Move the chart to the right of the data.	The Box and Whisker chart is added to the sheet.		
6.	Right-click the first data series in the chart, choose <i>Format Data Series</i> from the menu.	The <i>Format</i> pane opens with the data series options actively displayed.		
7.	Adjust the Gap Width with the slider to 50% .	You can also type the value directly into the Gap Width field.		
8.	Uncheck all the checkboxes.	Any extra elements are removed from the series.		
9.	Change the Quartile Calculation type.	The whiskers change in relation to the calculation. The outlier values are included or not.		
10	. Select each data series and make the same modifications to the series options.	Modifying a data series will only apply to the selected series, each one requires individual modifications.		
11. Save the file.		[Ctrl + S].		

Treemap Charts

The Treemap is well suited to showing comparative hierarchical trends in categorized data. Categories contain a series of rectangles, each smaller shape represents a subset or branch of the tree. The structure of the data should move across columns from main-category to sub-categories in descending order from left to right with the last column containing the values.

Note If there are several columns of values, consider making several Treemap charts with noncontinuous selections, categories and differing value columns.

Main (Categories Co	Values Columr	ı	
	Su	b Categories Column	Ļ	
	Program	Course	Students	
	Excel	Level 1	458	
	Excel	Level 2	613	
	Excel	Level 3	700	
	Excel	Data Analysis	495	
	Excel	Formulas	905	
	Excel	PivotTables	352	
	Excel	Charts	126	
	Excel	PowerPivot	328	





Creating a Treemap Chart

- Select your data.
 - To select in a noncontinuous manner: select the category columns and then hold the [Ctrl] key to select a value column of data.
- ♦ Activate the *Insert Tab*.
- \$

Treemap Charts, continued

In the Charts Group, locate and click the [Hierarchy Chart] button drop-down. Choose *Treemap* from the menu.

	(
Treemap			
Sunburst			
\bigcirc			
More	Hierarch	y Charts	

- OR -

- Click the [Recommended Charts] button in the Charts Group.
- **♦** The *Recommended Charts* dialog opens.
 - On the *Recommended Charts* tab, since the data is structured for this type of chart a *Treemap* will be one of the options to choose.
 - On the *All Charts* tab, select *Treemap* from the list

Setting the Label Display

Colors are automatically applied to differentiate the categories. Treemap shapes can display labels to clearly indicate the subcategory or not, enabling and modifying labels will improve the charts readability.

- ♦ If the labels are needed but not visible:
 - Right-click one of the shapes Treemap shapes and choose *Add Data Label* from the menu.

- OR -

- Select the chart, then click the [Chart Elements] button beside the chart, check the Data Labels checkbox.
- To choose the label:
 - Right-click one of the Treemap shapes and choose Format Data Series from the menu.
 - **♦** The *Format* pane opens to *Series Options*.
 - In *Label Options*, choose the desired display option.

Sunburst Charts

Like a Treemap, Sunburst charts are used to show hierarchical relationships within a data set. While Treemap charts show comparative relations with size, Sunbursts effectively reveal how categories are or can be broken down into contributing sub-categories. The inner most circle are the main categories within the data and each subsequent ring shows the division of the category component parts, the larger the wedge the large it's contribution with its' category.

The data must be structured in the same way as it was in the Treemap chart. Category columns leading into their assocated values.

Main Categ	Value Columns					
Sub-Categories Colum			nn			
	Sub-Catego			ories Column		
↓ I		¥		¥		
First Quarter	Program	Course	Students	Cost	Total	
Jan	Excel	Level 1	153	245	\$ 37,485.00	
	Excel	Level 2	410	245	\$100,450.00	
	Excel	Level 3	75	245	\$ 18,375.00	
	Excel	Data Analysis	53	245	\$ 12,985.00	
	Excel	Formulas	80	180	\$ 14,400.00	
	Excel	PivotTables	203	180	\$ 36,540.00	
	Excel	Charts	87	180	\$ 15,660.00	
	Excel	PowerPivot	63	180	\$ 11,340.00	
Feb	Excel	Level 1	315	245	\$ 77,175.00	
	Excel	Level 2	407	245	\$ 99,715.00	
	Excel	Level 3	96	245	\$ 23,520.00	



Create a sunburst chart

- Select your data.
- Activate the Insert Tab.

Note The main category does not have to be repeated in order to be established as the main category, in either hierarchical chart type.

Sunburst Charts, continued

In the Charts Group, locate and click the [Hierarchy Chart] button drop-down. Choose Sunburst from the menu.

Treemap
Sunburst
More Hierarchy Charts

Since Sunburst charts are hierarchical, they will also be available as recommended chart type.



Instructions:			Results/ Comments:		
1.	MyCharts.xlsx file should still be open.	-	If not, re-open the file from the data files folder.		
2.	Activate the <i>Treemap</i> sheet.		Click the <i>Treemap</i> sheet tab at the bottom of the spreadsheet.		
3.	Select cells A1:C17.				
4.	Click the <i>Insert Tab</i> in the ribbon.	,	The Treemap chart is added to the sheet.		
5.	In the Charts Group , click the [Insert Hierarchy Chart] button drop-down, choose <i>Treemap</i> from the menu. Move the chart to the right of the data.				
6.	Right-click the first data series in the chart, choose <i>Add Data Labels</i> from the menu.		Data labels are added to the chart groupings and rectangles.		
7.	Select cells A30:F54.	.	Take note the structure of the data.		
8.	Click the <i>Insert Tab</i> in the ribbon.				
9.	In the Charts Group , click the [Insert Hierarchy Chart] button drop-down, choose <i>Sunburst</i> from the menu. Move the chart to the right of the data.		The Sunburst chart is added to the sheet.		
10	. Right-click the first data series in the chart, choose <i>Add Data Labels</i> from the menu		Data labels are added, showing the main grouping begins from the inner rings and works outward to individual items.		
11	. Save the file.		[Ctrl + S].		



Lesson Notes

Excel: Charts Rel. 1.1, 1/14/2021



Lesson 2: Modifying a Chart

Lesson Overview

You will cover the following concepts in this chapter:

- Modifications
- Redefining Chart Data
- Moving Charts
- ♦ Layouts and Styles
- Chart Elements
- Adding and Removing Chart Elements
- Formatting Chart Elements
- Saving a Chart Template



Lesson Notes

Modifications

Data is always being added to, updated, or changed in some manner. Charts would not be very useful if you couldn't modify them. There will be times the data range needs to be redefined to incorporate new data or examine smaller subsets of the data. The *Excel* charting tools offer the ability to modify all aspects of charts, from reselecting the data, changing the orientation of some charts, adding or removing chart elements, and applying formatting.

Once a chart has been created, it is a good idea to format it. This gives you the opportunity to apply your branded colors, fonts, and logos to the chart, to reinforce your corporate identity. While it is easy to apply formatting to the chart elements, it can become tedious work. To that end, when the chart type you are working with is completely formatted you will want to save it as a template.

Chart templates allow you to apply formatting to new charts in *Excel* with only a few clicks of the mouse, giving you the ability to create a consistent look for all of your documents. These templates are stored, by default in the **Microsoft/ templates/ charts** folder. This folder location is shared by all of your *Microsoft Office* programs allowing you to use the same chart formats across the *Office Suite* of programs.

This lesson will take you through the processes of redefining the chart data, selecting the charts elements, adding or removing chart elements, formatting the elements, saving the chart template, and applying the chart template to new or existing charts in *Excel*.



Redefining Chart Data	Switching Rows and Columns By default <i>Excel</i> will plot the data in your chart by rows. Each row represents a " <i>series</i> ". This means, you are comparing row data that is then grouped in columns. The column labels will appear in the legend. The row labels appear on the x axis.					
	When you click on the [Switch Row/Column] button in the Data Group on the <i>Design Tab</i> , the data will switch so that now you are comparing the column data. The legend will show the row labels and the column labels will appear on the x axis. You can switch back and forth to help you determine which configurations best represents the data being charted. This option does not work well in every chart type.					
Note THe Select Datra dialog can also be opened from the right-clicking menu of the chart.	To switch rows and columns:					
	Select the chart.					
	Click the <i>Design Tab</i> .					
	Click the [Switch Rows/Columns] button.					
	Select Data					
	There may be times when the data you are using for the chart has had new data added and the chart is no longer accurate, or that you included more than needed, or simply did not select the correct data to be charted. When this happens it is not necessary to delete the chart and start over, you can redefine the data range the chart is drawing from. This is done by clicking the [Select Data] button in the Data Group on the Design Tab or from within the [Filtering] button options					
	Values Names Values Names Switch Row/ Select Column Data Data Data Oata Oata Oata Oata Oata					

Select Data...

Out of Paper
 Power Surges
 Connection Problems

Apply

Redefining Chart Data, continued

When you click the button; *Excel* opens the *Select Data Source* dialog, takes you back to the data source, and highlights the current data used by the chart. Even if the chart is on a different worksheet than the chart.

Select Data Source		?	×
Chart data range: = 'Bar Single Series'!SAS1:SBS7			1
Switch R	ow/Column		
Legend Entries (Series)	Horizontal (Category) Axis Labels		
∐ Add	Edi <u>t</u>		
Down Time in Minutes	Jams		^
	Misfeeds		
	Out of Ink		
	Out of Paper		
	Power Surges		~
Hidden and Empty Cells	ОК	Car	ncel

In this dialog you can either type in the cell range you want into the **Chart data source** field or while the field is highlighted, click and drag to define the new data range from the data on the worksheet.

As you can see in the dialog, you have access to the **[Switch Rows/Columns]** button and even edit the text and content along both axis. When you finish making changes, click the **[OK]** button to be taken back to the chart.

To Redefine The Data Range Of A Chart:

- Click on the [Select Data] button in the Data Group on the Design Tab.
- ♦ The *Select Data Source* dialog opens.
- Select the new range in your worksheet or use the Chart data source field in the dialog box.
- Make any other changes you want in relation the context on the axis.
- Click [OK].



Filtering Charts

Excel now has the ability to filter chart data directly in the chart itself. Allowing you to focus in on specific subsets within the data, without having multiple charts which each show subsets of information. The button is displayed only when a chart is selected, it is the bottom of the three new buttons to the right of the chart.



Clicking the **[Filter]** button open a list of all the *Charts' Series* and *Categories*. You simply uncheck the items that you don't want to included in the chart, click the **[Apply]** button and the chart is updated to reflect your choices.



From within the *Filter Options* menu, you are also able to access the *Select Data* dialog by clicking the **[Select Data]** button.



Y	ou Do This:	Results/ Comments:
1.	MyCharts.xlsx should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Bar Multiple Series</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
3.	Select the chart.	Click on the chart to make it active. Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.
4.	Click the <i>Design Tab</i> in the ribbon.	
5.	Click the [Switch Rows/Columns] button in the Data Group .	The X axis and legend are changed, the chart now displays the column data on the Y axis and the legend displays weeks.
6.	Click the [Switch Rows/Columns] button in the Data Group again.	The chart is returned to its original state.
7.	Activate the <i>Pie</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
8.	Click the [Switch Rows/Columns] button in the Data Group .	The chart no longer displays any useful information since this type of chart uses only two columns of data and displays that data as a percentage of the whole.
9.	Click the [Switch Rows/Columns] button in the Data Group again.	The chart is returned to its original state.
10.	. Activate the <i>Bar Multiple Series</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
11	. Click the chart to make it active.	If necessary.
12.	. Click the [Select Data] button in the Data Group on the <i>Design Tab</i> in the ribbon.	The Select Data Source dialog opens.
13	. In the Chart data source field, change the cell address \$E\$6 to \$D\$6 and click [OK] .	Highlight the letter E in the address and type D .



You Do This:	Results/ Comments:
14. Observe the chart.	The chart now omits the Income data from the chart.
15. Activate the <i>Pie</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
16. Click the chart to make it active.	If necessary.
17. Click the [Select Data] button in the Data Group on the <i>Design Tab</i> in the ribbon.	The Select Data Source dialog opens.
 While the Chart data source field is highlighted, use the mouse to select cells A1:A7 then holding the [CTRL] key select cells G1:G7 and click [OK]. 	The chart data source now is completely redefined to pull data from elsewhere in the data set.
19. Observe the chart.	The chart now displays 2016's values.
20. Activate the <i>Bar Multiple Series</i> sheet.	
21. Select the chart.	
22. Click the [Filter] button.	The menu of filtering option is displayed.
23. Uncheck one the <i>Series</i> and <i>Categories</i> checkboxes and click the [Apply] button.	The chart now only shows the items that were stilled checked. Notice that there is also a [Select Data] button in the menu.
24. Click the [Filter] button.	The menu of filtering option is displayed.
25. Check the Select all checkboxes for both the <i>Series</i> and <i>Categories</i> and click the [Apply] button.	The chart now shows all the data in the data set.
26. Save the file.	[CTRL + S].

Moving Charts



Moving Charts

By default, *Excel* will place a chart into the worksheet that contains the data when using the chart buttons on the *Insert Tab* or *Quick Analysis* smart tag. However, charts can be placed on a worksheet by themselves or other worksheets by using the [Move Chart] button on the *Design Tab*. The right-click menu also offers a *Move Chart...* option.



When you click the button the *Move Chart* dialog opens, from this dialog you can choose to move the chart to other existing worksheets or create new worksheet for the chart.

Note Consider moving several charts onto a single worksheet. Creating a type of dashboard worksheet that shows all relevant charted data in one place.

Move Chart				?	\times
Choose when	e you want the ch	art to be placed:			
	○ New <u>s</u> heet:	Chart1			
	Object in:	Pie			`
			ОК	Cano	el

Move a Chart to Another location

- Select the chart.
- Click the *Design Tab* in the ribbon.
- Click on the [Move Chart] button.
- The *Move Chart* dialog opens.
 - Move to an existing worksheet, click the Object in: radio button and click the down arrow of the Sheet Name field to select an existing sheet.

- OR -

- Move to a new sheet, click the *New sheet* radio button. To name the sheet, type a name in the Name field.
- When done, click [OK] or press [Enter].

Moving charts with this tool only applies within the current workbook. In order to move a chart into another workbook, use the worksheet *Move or Copy* tool. Remember to check the copy checkbox if you still want a copy of the chart in the original file

<u>(</u>

Action 2.2 - Moving Charts



Y	ou Do This:		Results/ Comments:
1.	MyCharts.xlsx should still be open.	I f	If not, re-open the file from the data files folder.
2.	Activate the <i>Bar Multiple Series</i> sheet.	(5	Click the sheet tab at the bottom of the spreadsheet.
3.	Select the chart.	(22 (Click on the chart to make it active. Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.
4.	Click the <i>Design Tab</i> in the ribbon.		
5.	Click the [Move Chart] button in the Location Group .]	The <i>Move Chart</i> dialog opens.
6.	Choose the <i>Objects in</i> radio button and click the drop-down arrow to see the list of existing worksheets in this file.	T C f	This option allows you to move a chart onto any other worksheet in the current file.
7.	Choose the <i>New Sheet</i> radio button and replace the New sheet field text with My New Bar .		
8.	Click the [OK] button.	z v t	A new worksheet is be added to the file with the name <i>My New Bar</i> . The only thing on the new sheet is the chart, this is a much cleaner way to present the chart.
9.	Save the file.	[[CTRL + S].

Layouts and Styles

Chart Layouts

Excel offers a series of different chart layouts in the **Chart Layouts Group** on the *Design Tab*. These are pre-built layouts with recommended chart elements in place. To see what is offered, click the **[Quick Layout]** button drop-down and click the one you want to use. You are not limited to using only the prebuilt layouts offered here, you can add, move, or remove chart elements at will with the tools found in the **[Add Chart Element]** button on the *Design Tab* or by using the **[Add Chart Element]** to the right of the chart.





The gallery options will change based on the type of chart.

Chart Styles Group

On the *Charts Tools Design Tab* is the **Chart Styles Group** of commands. In this group of command you will find a gallery of pre-built styles and colors.



Clicking the Style Gallery more button expands the gallery, enabling you to see all available options.



Clicking the [Change Colors] button gives you access a gallery of color palettes.

Layouts and Styles, continued

The Chart Styles and Colors button

Another way to access these galleries is to use the **[Styles And Color]** button, which is found to the right of the chart.



When you click the button, a gallery with two tabs is displayed. The first tab contains a complete list of available styles.

The second tab contains the Color palette gallery.

These galleries are the same as found in the **Styles Group** on the **Design Tab**.



If you need to change the color palettes offered in the Change Colors galleries, you will need to create a new set of custom color themes.

To create a new custom color theme

- So to the **Page Layout Tab**.
- In the Themes Group, click the [Colors] drop-down button.
- Choose Customize Colors to open the Create New Theme Colors dialog.
 - Change the *Accent* colors to create a palette of your own design.
 - Type a name in the Name field and click the [Save] button.



Action 2.3 - Chart Layouts and Styles



You Do This:	Results/ Comments:
1. MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2. Select the chart on the <i>Bar Single Series</i> sheet.	Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.
3. Click the <i>Design Tab</i> in the ribbon.	
4. Click the [Quick Layout] button in the Chart Layouts Group .	A gallery of quick layout options is displayed.
5. Hover over each of the options in the gallery.	This is a live preview gallery. So as you hover over the options, the chart changes to reflect that option.
6. In the Styles Group , c lick the [More] button of the Styles gallery.	The gallery of pre-built styles is displayed.
7. Hover over each of the options in the gallery	This is also a live preview gallery, allowing you to see how each option will look when applied.
8. Click the [Styles] button to the right of the chart.	You have access to the same styles as in the Style Gallery on the <i>Design Tab</i> .
9. Scroll through the list of styles and hove over them.	er The menu offers live preview.
10. Click the <i>Colors Tab</i> at the top of the menu.	The gallery displays the color available palettes.
11. Apply a different style and color palette to your chart.	
12. Save the file and leave it open.	[CTRL + S].

Ochart Elements

Chart Elements

A chart can contain many elements, the availability of the elements depends on the type of chart being used. When applying *Quick Layouts*, some charts elements are added or removed as part of the chosen layout. A list of chart elements was presented at the beginning of the last lesson but we shall review then again here.

Elements Used By All Chart Types

- Chart Area: The area that makes up the chart, every charts has a chart area. This encompasses all the elements used by a chart.
- Plot Area: The area where the actual chart is displayed, enclosed by the axis. Every charts has a plot area, 3D charts can enclose three axis and their titles.
- Category; X Axis: The horizontal line where labels of the chart's categories are arranged. Categories are the individual measurement intervals or groupings for the original data.
- **Value; Y Axis:** The vertical axis of column charts.
- Data Series: The data series is a collection of data points (or markers), they normally correspond to the data held within a single row or column.
- Data Point: These are the individual values in the data that the chart is displaying within each Data Series.
- Chart Title: This can be created automatically or added or removed at your discretion.
- Legend: This is used to identify the data series in the chart.
- Data Labels: These can be added to display the actual values from the data to each data point. The only chart that does not allow data labels to the chart is the Surface chart.

Chart Elements,	Elements Dependent on Chart Type
continued	Depending on the chart type being used, the chart may or may not have all these items.
	Category; X Axis Title: This is used to display a title below the x-axis of the chart. Not available when using the Pie, Doughnut, or Radar charts.
	Value Y Axis Title: This is used to display a title along the left of the y-axis of the chart, it can be vertical, stacked, or rotated text. Not available when using the Pie, Doughnut, or Radar charts.
	Gridlines: These are extensions of the axis scale, they are placed on the walls or the plot area of the chart to make it easier to estimate the value of specific data points. They can be placed on both horizontal and vertical axis. Not available when using the Pie or Doughnut charts.
	Data Marker: A piece of data plotted on a chart, normally corresponds to the data in a single cell. This can be a column value, bar, slice, cross or square depending on the type of the chart. Only available in Line, Scatter, or Radar charts.
	Data Table: A grid that appears in the chart displaying the exact data that is used to create the chart. Not available when using Pie, Doughnut, Bubble, Surface, Scatter, or Radar charts.
	Trend line: This is used to show trends of a data series on the chart, it is possible to forecast future trends based on the current data. Each data series can have a trend line applied. Not available when using the 3D Line, Pie, Area, Doughnut, Surface, or Radar charts.
	Error Bars: These can be used to display the amount of error or uncertainty with each data point. Not available when using certain Bar, Column, and Line charts, Pie, Area, Surface, or Radar charts
	Wall: Only applicable to 3D charts. Consider it as the side and back of a 3D plot area, although it can be formatted separately from the plot area.
	Floor: Only applicable to 3D charts. Consider it as the bottom of a 3D plot area, although it can be formatted

separately from the plot area.

0



You Do This:			Results/ Comments:
1.	MyCharts.xlsx file should still be open.		If not, re-open the file from the data files folder.
2.	Select the chart on the <i>Bar Single Series</i> sheet.		Click on the chart to make it active. Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.
3.	Click the <i>Design Tab</i> in the <i>Chart Tools</i> set of tabs on the ribbon.		The <i>Design Tab</i> tools are displayed in the ribbon.
4.	In the Chart Layouts Group , click the [Add Chart Elements] drop-down button to expand a list of available <i>Chart Elements</i> .		Each item in the list can further be expanded to show more options related to that given element.
5.	Hover over the <i>Chart Title</i> element to expand the list, Hover over each of the available options.		This is another live preview gallery, and as such we are shown how our choices will impact the chart.
6.	Click the [Chart Elements] button to the right of the chart.		A list of elements available for this type of chart are displayed in the menu.
7.	Hover over the <i>Chart Titles</i> option and click the arrow to expand the additional options for the <i>Chart Title</i> .		These are similar to those offer in the [Add Chart Elements] button on the <i>Design Tab</i> .
8.	Select the <i>Doughnut Chart</i> on the <i>Doughnut</i> sheet.		
9.	In the Chart Layouts Group , click the [Add Chart Elements] drop-down button to expand a list of available <i>Chart Elements</i> .		If any options are greyed out , then they are not applicable to this type of chart.
10.	Click the [Chart Elements] button to the right of the chart.		This menu will only show the elements available for this type of chart.

Adding and Removing Chart Elements



Now that you are able to determine what elements are available for the chart types it is time to add or remove the elements as needed. When the charts is active you are able to add or remove chart elements using either the *Design Tab* or the **[Chart Elements]** button.

Adding Chart Elements From the Design Tab

With a chart actively selected, activate the Design Tab in the ribbon. In the **Chart Layouts Group** click the **[Add Chart Element]** to display a list of available elements. Should any elements be greyed out, then that specific element can not be applied to the current chart.

As you hover over any of the elements, you can click the arrow to expand the options for that element.



Adding Chart Elements Using the Element Button

The **[Chart Elements]** button, located to the right of the chart will also show a list of available chart elements. This list will show only the elements associated with the currently active hart type.

Checking the checkbox for a given element will turn it on or off. Clicking the arrow beside an element will show the options of the element.



Adding and Removing Chart Elements, continued

Adding Chart Elements

- Click into the chart.
 - On the *Design Tab*, locate and click on the [Add Chart Element] button.
 - Scroll down to the desired element, click it to expand its options. Select the desired element option.

- OR -

- To the right of the chart, locate and click the [Chart Element] button.
 - Check the desired element checkbox to turn on the element. Clcik the arrow of the desired element to expand the list of options.

Removing Chart Elements

When the element is actively selected, tap the [Delete] key.

- OR -

- On the *Design Tab*, locate and click the [Add Chart Element] button.
 - Expand the element options and choose *None* from the set of options.

- OR -

- Click the [Chart Element] button to the right of the chart.
 - Scroll down to the unwanted element and uncheck the checkbox.



You Do This:		Results/ Comments:		
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.		
2.	Select the chart on the <i>Area</i> sheet.	Click the <i>Area</i> sheet tab, then click into the chart.		
3.	On the <i>Design Tab</i> , click the [Add Chart Element] in the Chart Layouts Group .	The list of available chart elements are displayed.		
4.	Hover over the <i>Chart Title</i> element, when the options appear, scroll over and click on Above Chart.	The Chart Title element is added to the chart, currently it displays the default text of Chart Title .		
5.	Type in: Home Sales . Then tap the [Enter] key.	When the title element is selected and you type text, when you tap the [Enter] key, the text is added to the element.		
6.	Select the chart on the <i>Pie</i> sheet.			
7.	Select the <i>Chart Title</i> element and press the [Delete] key.	The <i>Chart Title</i> element is removed from the chart.		
8. 9	On the <i>Design Tab</i> , click the [Add Chart Element] in the Chart Layouts Group	The legend is now active and in the position you chose.		
10	. Hover over the <i>Legend</i> element, when the list of available options are displayed, choose one.	You can hover over each of the options to see the live preview gallery show what each choice looks like.		
11	. Click any blank area of the chart.	The <i>Legend</i> is now added to the chart.		
12	. Save the file.	[CTRL + S].		

Formatting Chart Elements

Chart elements can be formatted with the controls found on the *Chart Tools Format Tab*. This tab will allow you to select elements, add new shapes to the chart, add Alt Text, apply formatting styles to text and elements, arrange the chart elements, and open the *Selection* pane.





To apply or modify formatting attributes of a chart element, you must first select it. This can be done by using the mouse to click on the element or by using the **Current Selection** field in the **Current Selection Group** on the *Format Tab*. The field has a drop-down arrow which expands to reveal every element currently in use in the chart, select the specific element to format then make the necessary modifications.



Once the element is actively selected, it can now be formatted. Formatting controls can be found on the *Formatting Tab* in the ribbon as well as on the Formatting pane. To access the *Formatting* pane, right-click any element in the chart and choose *Format (Element)* from the menu. It is a good idea to leave the Format pane open until all the formatting is completed. With that in mind, the formatting pane also offers a **Current Selection** drop-down list of all chart elements in use. The **Current Selection** drop-down is located below the *Format* pane title, this helps in selecting hard to click on elements such as gridlines.


ၜ

Formatting Chart Elements, continued

Note If you created a custom font theme and that theme is in use on the current file, then your basic text formatting choices are already in play.

Textual Elements

Excel offers a set of pre-built text styles called *WordArt Styles* which modify text fill color, text outlining and effect attributes. The styles are found on the *Chart Tools Format Tab* or *Formatting* pane. Unfortunately these styles do not impact the font, size, or other basic font formatting attributes, these attribute will be modified from either the *Home Tab*.

Font Formatting

Since charts contain elements that are textually based, we will start with formatting text. This can be done using the font formatting tools on the *Home Tab*.



Text formatting tools on the Home Tab

To access an even greater level of text formatting control, click the **[Font Settings]** button in the lower right corner of the **Font Group**.

Cali	bri (l	Body)	*	10	*	A	A
B	I	U	Ŧ		-	٩	- 4	A -
			Fo	ont				E.
			Fe	ont	Sett	ings	s bu	↑ tton

The *Font* dialog opens, giving full control over font formatting and character spacing.

ont						?	×
Fo <u>n</u> t Cha <u>r</u>	acter Spacir	ng					
Latin text f	ont:		~	Font st <u>y</u> le: Regular	∑iz	e:	
East cals	1						0
Effects	er 🔛 🔻	<u>U</u> nderlin	e style (n	one)	Underl <u>i</u> r	ne color	<u>(h</u> -
Effects Strike Doub Super Super	through le Strikethr rscript	Underlin ough Offs <u>e</u> t:	e style (n 0%	one) S <u>m</u> all Ca All Caps E <u>q</u> ualize	Underl <u>i</u> r ps Character He	eight	<u>()</u>

Take this opportunity to apply branded fonts, maintaining a consistent look across documents.

Formatting Chart Elements, continued

Font Styling With WordArt

The *WordArt Styles* offer quick formatting designed to make the appearance of the text on eye-catching. The **WordArt Styles Group** on the *Chart Tools Format Tab* has a gallery of pre-built styles and also controls which allow for customization to the style.



WordArt Styles are also found in the *Format* pane when any selected chart element contains or can contain text. To access the *WordArt* controls n the *Format* pane switch from *Shape Options* to *Text Options*. Then choose the category of controls from the list of three options.



Applying WordArt to Text

- Select the chart element with text to the formatted.
- Activate the *Chart Tools Format Tab* or right-click the chart element and choose *Format (Element)* to open the *Format* pane.
- ♦ Using the *Format* pane:
 - Click the [Text Options] button at the top of the pane.
 - Click the **[Text Fill & Outline]** options button.
 - Expand the *Text Fill* options to access the fill controls.
 - Expand the *Text Outline* options to access the outlining controls.
 - Click the **[Text Effects]** options button.

Formatting Chart Elements, continued

- All the effect categories can be expanded to gain access to their controls.
- Click the **[Textbox]** options button.
 - Here you are able to control the vertical alignment, text direction, and margins of the textbox.
- Using the *Chart Tools Format Tab*:
 - Click the Gallery drop-down to see the pre-built set of options and choose one as a starting point.
 - To change the fill color of the text, use the [Text Fill] button drop-down.
 - To change to text outline, use the [Text Outline] button drop-down. Here you will be able to change the color, weight (thickness), and Dashes (line type).
 - To change the text effect, use the [Text Effects] button drop-down. Here you will be able to modify shadows, glows, reflections, bevels, 3-D rotation, and transformations.



Each of these button drop-down will also contain additional drop-downs that allow more controls. Eventually, if you follow all the options you wil end up in the *Format* pane.

To apply formatting to all text elements within the chart, select the chart and not a specific text element. With the chart actively selected, any changes will be applied to all text elements. Use the text formatting tools available on the *Chart Tools Format Tab*, *Home Tab*, or *Format* pane.





Y	ou Do This:	Results/ Comments:		
1.	MyCharts.xlsx file should still be open.	I f	If not, re-open the file from the data files folder.	
2.	Activate the <i>Column Single Series</i> sheet.	s s	Click the sheet tab at the bottom of the spreadsheet.	
3.	Select the chart.	(2 0	Click on the chart to make it active. Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.	
4.	Click the <i>Home Tab</i> .			
5.	In the Font Group , change the font to <i>Trebuchet MS</i> .		The font is changed for all the text in the chart.	
6.	Click the <i>Format Tab</i> in the <i>Chart Tools</i> set of tabs on the ribbon.	r	The <i>Format Tab</i> tools are displayed in the ribbon.	
7.	Click the [More] button of the WordArt Styles gallery.] €	The gallery of WordArt Styles is expanded.	
8.	Hover the cursor over the gallery preview tiles.	y y c r	Since the gallery is live preview enabled, you should see all textual elements changing as you move from one tile to the next.	
9.	Click away from the gallery to close it without applying any of the styles.	1	No style is applied and the gallery closes.	
10	. Click the [Dialog Launcher] button at the lower right corner of the WordArt Styles Group .]	The Format Text Effects dialog opens.	
11	. Select the <i>Text Fill</i> category on the left side of the window.	t t	Options related to different styles of filling the text are displayed on the right side of the window.	
12	. Click the <i>Solid</i> radio button and the click the <i>Color</i> drop-down and choose <i>More</i> <i>Colors</i> from the menu.]	The <i>Colors</i> dialog opens.	



You Do This:	Results/ Comments:
13. Click the <i>Custom Tab</i> and enter the specific RGB values of your branded color.	It is in the custom color dialog where you are able to exactly set the color. Every color choice command will allow you into the <i>Color</i> dialog where specific colors can be applied.
14. Select the <i>Shadow</i> category, under text effects in the Format Pane.	Options related to shadow styles are displayed on the right side of the window.
15. Click the <i>Presets</i> drop-down and choose any choice you like.	
16. Explore the other categories but <i>don't</i> apply any other effects.	
17. Click the [Close] button.	They formatting effects are applied to the text.
18. Select the Chart Title and activate the <i>Home Tab</i> .	You will change only this element by selecting it.
19. In the Font Group , change the size of the text to 28.	The size of the title text is changed.
20. Save the file.	[CTRL S].

0

Formatting Chart Elements, continued



Formatting Graphic Elements

Once an element has been added to the chart, it may require formatting. You can select the element using either the mouse or the from the **Current Selection** field in the **Current Selection Group** or *Format* pane. When an element is selected it can be formatted.

Shape formatting tools are found on the *Chart Tools Formatting Tab* in the **Shape Styles Group** or in the *Format* pane.

To access the Format dialog:

- Select and right-click an element, then choose *Format* (*Element*) from the menu.
 - OR -
- Click the [Dialog Launcher] button in the Shape Styles Group on the Format Tab.



Once the *Format* dialog is open you can choose the aspect of the element to be formatted from the list of categories on the top of the window and the available options are listed below in the window. This dialog works in the same manner as the *Format Text Effects* dialog.



Formatting Chart Elements, continued

The basic categories in the *Format* dialog include:

- The Fill Category: allows you to remove any fills of the element, add solid color fills, add gradient fills, add picture or texture fills, pattern fills, or use the automatic fill which is white.
- The Border Color Category: allows you to remove the border color, add a color, add a gradient, or use the automatic border which is no border.
- The Border style category: allows you to control the width, compound type, dashes type, caps, and spacing.
- The Shadow Category: allows you to add shadows to the element and control all aspects of the shadow.
- The Glow and Soft Edges Category: allows you to add glows and soft edges to the elements and control all aspects of the effect.
- 3D: allows you to apply and control the bevel, depth, contour, and surface of the objects.
- Size: allows you as set the size of the chart or selected element.
- Properties: allows you to control the positioning of the chart in relation to the worksheet and protection properties.

Others will become available depending on the element or chart type being worked with. As you see them, take the time to explore what can be done with them.

Formatting the Axis and Gridlines

Excel creates the scale of the axis automatically based on the value range in the existing data. This scale may not always fit your needs, requiring that a custom scale be created.



• Formatting Chart Elements, continued

When an axis is selected and the *Format* pane is open, click the [Axis] options button.



With the Axis options active, you are able to customize the scale of values the axis uses, add major and minor gridlines, modify the tick marks, the labels, and apply number formatting. Each of these categories can be expanded to reveal all necessary controls.

Expanding the *Axis Options* categories allows you to: set the upper and lower limits of the bounds, modifying the units sets the gridlines increments, change the horizontal axis value, add or remove the axis display units, enable a logarithmis scale, and invert the axis scale.

Format Axis • × Axis Options • Text Options				
Bounds				
Minimum 0.0 Auto				
Maximum 700000.0 Auto				
Units				
Major 100000.0 Auto				
Minor 20000.0 Auto				
Horizontal axis crosses				
Aut <u>o</u> matic				
O Axis value 0.0				
 <u>M</u>aximum axis value 				
Display <u>u</u> nits None 👻				
Show display units label on chart				
Logarithmic scale 10				
Values in reverse order				

Should axis use dates, then controls related to applying a date scale are available in the *Format Axis* pane.

Once the units for the gridlines are set, you may need to make some formatting changes to those lines. Selecting the gridline can sometimes be difficult when using the mouse, so use the **Current Selection** field in either the *Chart Tools Design Tab* or *Format* pane. With the gridline selected you are now able to modify the line color, weight, or style.





Y	You Do This:		Results/ Comments:
1.	MyCharts.xlsx file should still be open.		If not, re-open the file from the data files folder.
2.	Activate the <i>Column Single Series</i> sheet.		Click the sheet tab at the bottom of the spreadsheet.
3.	Select the chart.		Click on the chart to make it active. Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.
4.	Right-click into the blank area of the chart and choose <i>Format Chart Area</i> from the menu.		The Format Chart Area pane opens.
5.	Select the <i>fill</i> category then click the <i>Solid Fill</i> radio button.		
6.	Click the Color drop-down and choose <i>More Colors</i> from the menu.		The Color dialog box opens.
7.	Click the <i>Custom</i> tab and enter the RGB values as; 133, 197, and 87 Click the [OK] button.		You are entering in the values of a branded color.
8.	Set the transparency to a value of 75 .		The chart area fill is now semi-transparent.
9.	Click the vertical axis text.		The <i>Format Chart Area</i> pane changes to the <i>Format Axis</i> .
10	. Select the <i>Axis Options</i> category on the top of the format pane.		The axis options are displayed.
11	. Change to Minimum value for bounds to 90000 .		The current value at the low end of the axis will be changed. The word Auto will be replaced with "Reset".
12	. Change the Major Unit value to 10000 .		The major divisions of the axis scale will be changed.



You Do This:	Results/ Comments:
13. Change the Minor Unit value to 5000 .	The subdivisions if the axis scale will be changed.
14. Click the [Close] button.	The changes you made the axis are displayed.
15. Select the legend and tap the [Delete] key.	The legend is removed from the chart since it is not necessary in this chart.
16. Activate the <i>Stock</i> sheet.	Click the sheet tab at the bottom of the spreadsheet. Notice how the date scale at the bottom of these charts is not very well laid out.
17. Right-click on the horizontal axis containing the dates and choose <i>Format Axis</i> from the menu.	The <i>Format</i> pane shows <i>Axis</i> options.
18. Change the Major Unit value to 14 (days).	We want to see the scale in bi-weekly format.
19. Try clicking other elements in the chart to see the formatting options that are available.	The formatting changes you just made are visible in the axis. You can change other elements to modify the chart so it is more to your liking.
20. Click the [Close] button.	To finish and apply any other changes made.
21. Save the file.	[CTRL S].

Saving a Chart Template

To share the

template with other people, sending

them a copy of the file so

they can save the chart as a template on their own

Note

system.

After all the chart elements have been formatted to meet branding standards or is simply formatted they way you want, it is time to save it as a template for later use. By creating templates based on a formatted chart, you will be able to apply the template to new chart which will help in creating a standardized and consistent look to your work. When saving the templates, do not change the default location since templates in the default location are available in any of the other *Microsoft Office* applications in the suite.

Save the Template

- Select the formatted chart.
- Right-click the chart, choose the Save as Template option.

Fill	Outline Plot Area	
	<u>D</u> elete	-
2-	Reset to Match Style	-
	Change Chart Type	
æ	Save as Template	-
6	S <u>e</u> lect Data	-
	3-D <u>R</u> otation	ŗ
∄	Format Plot Area	-

The Save Chart Template dialog opens.



$\leftarrow \rightarrow$ \checkmark \Uparrow 📒 « Templ	ates > Charts	✓ Ŏ Search Charts	, J
Organize 👻 New folder			BH • (
Solutions	Name	^	Date modified
Microsoft Excel		No items match your sear	ch.
🗠 OneDrive			
This PC			
Desktop			
Documents			
🖶 Downloads			
Music			
Pictures			
Videos			
Local Disk (C:)	v <		
File name: Chart1			
Save as type: Chart Ter	nplate Files		
Save as type: Chart Ter	nplate Files		
Hide Folders		Tools - Save	Cancel

- Do not change the location of where it is being saved, it will be directed to the Microsoft\
 Templates\Charts folder by default. This ensures ealy access from other Office applications.
- Name the template something short and descriptive and click the [Save] button.

If you use several chart types you should consider saving each formatted chart type as a template to speed the charting process.

Saving a Chart Template, continued

Using the Chart Template

- Create a new chart or select an existing chart.
- Click the [Change Chart Type] button in the Type Group on the Design Tab.

- Right-click the chart and choose Change Chart Type from the menu.
- The *Change Chart Type* dialog opens.

Change Chart Type			?	×
Recommended Charts	II Charts			
Recent	My Templates			- 1
Templates	Chart1			- 1
📊 Column	Chart Title			- 1
🖄 Line	*			- 1
O Pie	$\overset{\infty}{=} \frac{1}{2^{n+1}} \frac{1}{n+1} $			- 1
🗾 Bar				- 1
Area	44 3-Jan 20 25-dan 20 20-Jan 20 22-feb-20 Seried Seried Seried			- 1
😥 XY (Scatter)				- 1
<u>計</u> Stock				- 1
Surface				- 1
🖄 Radar				- 1
Treemap				- 1
Sunburst				- 1
Histogram				- 1
🔯 Box & Whisker				- 1
Waterfall				- 1
🕼 Combo				- 1
				- 1
				- 1
<u>M</u> anage Templates	[ОК	Can	cel

- In the Change Chart Type dialog box, choose the Templates folder from the list of categories on the left side of the window.
- The list of templates you have saved are listed.
- Select the one you want to apply to the new chart and click the **[OK]** button.

This procedure will be the same in the other *Office* applications the have charting tools. If you right-click the template, it can be set as the default, so when you create a new chart it will come in with your formatting applied.

⁻OR-



Y	ou Do This:	Results/ Comments:
1.	MyCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Column Single Series</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
3.	Select the chart.	Click on the chart to make it active. Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.
4.	Click the <i>Design Tab</i> .	
5.	Right-click the chart and select [Save As Template]	The Save Chart Template dialog opens.
6.	Name the template SingleCol and click the [Save] button.	Do not change the location where the template will be saved.
7.	Activate the <i>Bar Single Series</i> sheet.	You will create a new chart based on the data in this worksheet.
8.	Select cells A1:B7.	This is the data to be charted in a new column chart.
9.	Click the <i>Insert Tab</i> .	
10	. Click the [Column] button drop-down in the Charts Group and choose the first of the options.	A new column chart is added to the spreadsheet.
11	. Click the <i>Design Tab</i> .	Since the new chart is selected the <i>Chart Tabs</i> are available, if the tabs are not available, select the chart.
12	. Click the [Change Chart Type] button in the Type Group .	The Change Chart Type dialog opens.
13	. Click the <i>Templates</i> option in the categories listed on the left.	The list of saved template is displayed on the right side of the window.



You Do This:	Results/ Comments:
14. Choose the SingleCol template and click the [OK] button.	The chart now has the background color, font, font sizes, text effects, and axis scale applied. Everything looks good except the scale does not work in this case.
15. Right-click the axis and choose <i>Format Axis</i> from the menu.	The <i>Format</i> pane shows <i>Axis</i> options.
16. Change the Maximum , Minimum , Major and Minor Units back to <i>automatic</i> and click the [Close] button.	The charts axis scale is reset and the chart shows the data properly.
17. Right-click the chart and select [Save As Template] button.	You will save another version of the template. The <i>Save Chart Template</i> dialog opens.
18. Name the template; SingleColAutoScale and click the [Save] button.	Do not change the location where the template will be saved.
19. Click the [Change Chart Type] button in the Type Group .	The chart you have been working with should still be actively selected.
20. Click the <i>Bar</i> option in the categories listed on the left and choose the first one of the choices and click the [OK] button.	You will now change to chart type of a formatted chart. Notice the type of chart changes but the formatting remains the same.
21. Save the file.	[CTRL S].
22. Open <i>Word</i> and create a new blank document if needed.	Word should open with a new blank document by default.
23. Click the <i>Insert Tab</i> .	
24. Click the [Chart] button drop-down in the Illustrations Group and choose the first of the column options.	The <i>Insert Chart</i> dialog opens. This is similar to the <i>Change Chart Type</i> dialog <i>Excel</i> uses.



You Do This:	Results/ Comments:
25. Close the <i>Excel</i> window without changing the data.	When you insert a chart in <i>Word,</i> it splits the screen with an <i>Excel</i> spreadsheet. The spreadsheet contains default base data that you modify by entering your real data. This can be done manually or by pasting copied <i>Excel</i> data into the spreadsheet.
26. In <i>Word,</i> select the chart.	Notice that there are the same tabs for working with chart is <i>Word</i> as there are in <i>Excel</i> .
27. Click the <i>Design Tab</i> .	This tab offer the same set of commands.
28. Click the [Change Chart Type] button in the Type Group .	The Change Chart Type dialog opens.
29. Click the <i>Templates</i> option in the categories listed on the left.	You should see both templates that were saved while working in <i>Excel</i> .
30. Choose the SingleColAutoScale template and click the [OK] button.	The chart now has the formatting of the template applied.
31. Close <i>Word</i> without saving the file.	
32. Activate <i>Excel</i> by click the icon in the task bar at the bottom of your screen	<i>Excel</i> should now be the program running on the screen.



Tips and Notes

Excel: Charts Rel. 1.1, 1/14/2021



Lesson 3: Charts Advanced

Lesson Overview

You will cover the following concepts in this chapter:

- Sparklines
- Trendlines
- Error Bars
- Combination Charts



Lesson Notes

Sparklines

You may want to include a graphic representation of trends in the data, but adding a chart is not required or necessary. In situations like these, use a Sparkline to show trends. Create a simple line, column, or win/loss graph to visualize aspects within a data set. As Sparklines are not charts, but rather a small visual representation of the data in the background of a cell; making it possible to still enter text and apply formatting to the cell.

With data presented across rows or columns, it is not easy to see existing trends. Sparklines are useful tools for showing those trends right beside the data. Consider showing seasonal increases or decreases as small graphics next to raw data, this easily reveals economic cycles. It is also possible to highlight maximum and minimum values within the Sparklines.

As the data is updated, those changes are reflected in the sparkline immediately.

Creating a Sparkline

On the *Insert Tab*, locate the **Sparkline Group** and click the [Line] button.



The *Create Sparkline* dialog opens:

Create Sparklines			?	\times
Choose the data th	at you war	nt		
<u>D</u> ata Range:				Ţ
Choose where you	want the s	parklines to	be place	d
Choose where you Location Range:	want the s	parklines to	be place	d 1
Choose where you <u>L</u> ocation Range:	want the s \$I\$2	parklines to	be place	d 1

- Click in the Data Range: field, then highlight the cells you want to show as a graph.
- Click in the Location Range: field the choose the cell where you want the sparkline to be placed.
- ♦ Click the **[OK]** button.









- OR -

- Select the data range to be charted with a Sparkline.
- The *Quick Analysis Smart Tag* is displayed to the lower right of the selection.

<u>F</u> ormatting	<u>C</u> harts	T <u>o</u> tals	Tables	<u>S</u> parklines	-
	000	0000			
Line	Column	Win/Loss			

- Click the *Quick Analysis Tag* and choose the *Sparkline* option at the top of the dialog.
- Choose any of the three type of Sparklines to add them beside the selected data.

Things to Keep in Mind:

- Sparkline can be based off data in either rows or columns.
- The selected cell will automatically be placed in the Location Range: field.
- The location cell cannot be a merged set of cells.
- Multiple Sparklines can be created at the same time by selecting multiple cells that correspond to underlying data
- It is possible to create sparklines for additional rows of data by using the fill handle on the cell that containing a sparkline.

Formatting Sparklines

Once a cell containing a Sparkline is selected, the *Sparkline Design Tab* becomes available. This tab allows type of Sparkline to be changed, markers to be added or removed, styles can be applied, and to modify the axis. Since a Sparkline is not a chart, they are formatted with the controls found on the *Sparkline Design Tab* only. Right-clicking a cell with a Sparkline will allow access to the *Format Cells* dialog but not a Format Sparklines pane.

Sparklines, continued

Customizing Sparklines

While you are able to control the axis and would assume there would be an axis displayed in the sparkline, the axis controls are used to control the spacing of the markers and the vertical scale. If the sparkline data is based on an non-sequential series of dates, the axis can be defined using that series and will space the markers as if the missing dates were included in the data set.

	*[] oudronb
- -	🗶 Clear 👻
lo	izontal Axis Options
r	General Axis Type
	Date Axis Type
	Show Axis
	Plot Data Right-to-Left
e	tical Axis Minimum Value Options
r	Automatic for Each Sparkline
	Same for All Sparklines
	Custom Value
e	tical Axis Maximum Value Options
r	Automatic for Each Sparkline
	Same for All Sparklines

- Select a *Sparkline* (or a range of Sparklines).
- Select the *Sparkline Tools Design Tab*.
- **♦** Locate the **Group Group**.
- Click the [Axis] drop-down button to display a list of choices.
- Select one of the following options to change the scaling and/or visibility of the horizontal and vertical axis of the Sparkline:
 - General Axis Type displays the Sparkline as a 'general' horizontal axis type.
 - Date Axis Type used if your data includes dates and you want to arrange the data on the data points to reflect any irregular time period.
 - Show Axis shows the Sparkline horizontal axis.
 - Plot Data Right-to-Left changes the direction that the data is plotted.
 - Automatic for Each Sparkline specifies the automatic maximum and minimum values for all Sparklines.
 - Same for All Sparklines specifies the same minimum and maximum values for all Sparklines.
 - Custom Value specifies the custom minimum and maximum values for the Sparklines.

Action 3.1 - Adding Sparklines



Instructions: Results/ Comments: 1. Open the AdvancedCharts.xlsx file from the data files folder. 2. Activate the *Sparklines* sheet. By clicking the *Sparkline* sheet tab at the bottom of the spreadsheet. These are the cells the sparklines will be 3. Select cells I2:I7. placed. 4. Activate the *Insert Tab*, in the **Sparklines** The Create Sparklines dialog opens. Group click the [Line] button. 5. Click into the Data Range: field and This selects the cell range the sparklines highlight cells **B2:F7** and click the **[OK]** will be based on. The Location Range: button. field should already be populated based on the selection. The sparklines are inserted in the selected cells. If you had added the sparkline to the first cell you could use the autofill handle to populate the other cells. 6. Click the *Sparklines Design Tab*. If necessary. All formatting changes to sparklines are done from this tab. 7. In the **Type Group** try changing to both To see how they other types of sparklines other types of sparklines. Change them display the data. back to the *Line* type. Two markers are added to the lines. 8. In the **Show Group** check the check boxes for both the *High* and *Low points*. 9. Click the [More] button of the Sparkline The gallery expands to reveal all the Style Gallery and examine the available preformatted options. options but don't choose any. 10. Click the [Sparkline Color] button drop-From this drop-down menu you can choose line color and thickness. This is down and choose 1.5 from the Weight menu. another chance for you to use brand colors in the document.



Instructions:	Results/ Comments:
11. Click the [Marker Color] button drop- down, choose the <i>High Point Color</i> opt and choose the <i>Yellow</i> color from the <i>Standard Colors</i> .	- The High Point marker is now yellow.
12. Click the [Marker Color] button drop- down, choose the <i>Low Point Color</i> option and choose the <i>Red</i> color from the <i>Standard Colors</i> .	- The Low Point marker is now red. on
13. Click the [Axis] button drop-down and choose <i>Show Axis</i> .	d Nothing changes yet.
14. Click the [Axis] button drop-down, from the <i>Vertical Axis Maximum Valu</i> <i>Options</i> group and choose <i>Custom</i> <i>Value</i>	<i>ues</i> The <i>Sparkline Vertical Axis Settings</i> dialog box opens.
15. Set the value to 65000 and click the [O button.	W The sizing of the sparklines shifts in relations to the setting just entered.
16. Select column I and widen it to twice i original width.	its The column is wider and the sparkline is easier to see and understand.
17. Select cells A15:G21 .	The second data set.
18. Click the <i>Quick Analysis Smart Tag</i> as choose the <i>Sparkline</i> option at the top of the <i>Quick Analysis</i> window.	nd The <i>Quick Analysis</i> windows displayed.
19. Choose <i>Line</i> from the list.	The Sparklines are added in cells H15:H21 .
20. Click the <i>Sparklines Design Tab</i> and control the [Edit Data] button drop-down and choose <i>Edit Group Location and Data</i> .	The <i>Edit Sparkline</i> dialog is displayed.
21. Edit the Data Range to A15:F21 and cl the [OK] button.	lick The sparklines now reflect the correct data range.
22. Save the file as MyAdvancedCharts .	[CTRL + S].

o Trendlines

Trendline Overview

Once data is in a chart, you may want to use *Excel's* tools for forecasting values based on the existing data. Trendlines can be used to forecast a data series graphically in the chart, they can be added to any and all data series in a chart.

A Trendline is a graphic representation of an existing trend in a data series, they are used to see how a current trend may possibly move in the future. These can help in making decisions, barring an unforeseen event, a trend should continue along predicable lines. Chart types which allow Trendlines to be added include:

- Column
- ♦ Line
- Bar
- ♦ Area
- Stock
- Bubble

Choosing a Trendline Type

When you want to add a trendline to a chart in *Excel*, you can choose any one of these six different trend or regression types:

- Linear trendlines
- Logarithmic trendlines
- Polynomial trendlines
- Power trendlines
- Exponential trendlines
- ♦ Moving average trendlines

The type of data that you have determines the type of trendline that you should use.

A trendline is most accurate when its R-squared value is at or near 1. When you fit a trendline to your data, *Excel* automatically calculates its R-squared value. If you want to, you can display this value on your chart.

Trendlines, continued

Linear Trendlines

A linear trendline is a best-fit straight line that is used with simple linear data sets. Your data is linear if the pattern in its data points resembles a line. A linear trendline usually shows that something is increasing or decreasing at a steady rate.

This example, a linear trendline illustrates that refrigerator sales have consistently risen over a 13-year period. Notice that the R-squared value is 0.979, which is a good fit of the line to the data.



Logarithmic Trendlines

A logarithmic trendline is a best-fit curved line that is used when the rate of change in the data increases or decreases quickly and then levels out. A logarithmic trendline can use both negative and positive values.

This example uses a logarithmic trendline to illustrate predicted population growth of animals in a fixed-space area, where population leveled out as space for the animals decreased. Note that the R-squared value is 0.933, which is a relatively good fit of the line to the data.





Polynomial Trendlines

A polynomial trendline is a curved line that is used when data fluctuates. It is useful, for example, for analyzing gains and losses over a large data set. The order of the polynomial can be determined by the number of fluctuations in the data or by how many bends (hills and valleys) appear in the curve. An Order 2 polynomial trendline generally has only one hill or valley. Order 3 generally has one or two hills or valleys. Order 4 generally has up to three hills or valleys.

This example shows an Order 2 polynomial trendline (one hill) to illustrate the relationship between driving speed and fuel consumption. Notice that the R-squared value is 0.979, which is a good fit of the line to the data.



Power Trendlines

A power trendline is a curved line that is used with data sets that compare measurements that increase at a specific rate — for example, the acceleration of a race car at 1-second intervals. You cannot create a power trendline if your data contains zero or negative values.

In this example, acceleration data is shown by plotting distance in meters by seconds. The power trendline clearly demonstrates the increasing acceleration. Note that the R-squared value is 0.986, which is an almost perfect fit of the line to the data.





Trendlines, continued

Exponential Trendlines

An exponential trendline is a curved line that is used when data values rise or fall at constantly increasing rates. You cannot create an exponential trendline if your data contains zero or negative values.

In this example, an exponential trendline is used to illustrate the decreasing amount of carbon 14 in an object as it ages. Note that the R-squared value is 0.990, which means that the line fits the data almost perfectly.



Moving Average Trendlines

A moving average trendline smooths out fluctuations in data to show a pattern or trend more clearly. A moving average uses a specific number of data points (set by the Period option), averages them, and uses the average value as a point in the line. For example, if Period is set to 2, the average of the first two data points is used as the first point in the moving average trendline. The average of the second and third data points is used as the second point in the trendline, etc.



In this example, a moving average trendline shows a pattern in number of homes sold over a 26-week period.

0







Creating and Formatting Trendlines

- Create your Chart.
- Select the series of data you want to plot a Trendline on.
- Navigate to the *Chart Tool's Design Tab* in the Chart Layouts Group, click the [Add Chart Element] button drop-down and select the desired [Trendline].
- Continuing to select Trendlines this way will add more trendlines. Choosing [None] in the Trendline menu will clear all Trendlines.

Customizing Trendlines

If you do not want the default settings, you can create a Trendline with your own settings.

- Create your Chart. Select the series of data you want to plot a trendline along. The contextual tabs should be displayed.
- On the *Design Tab*, locate the Chart Layouts Group and click the [Add Chart Element] button.
- From the drop-down, select [Trendline], More Trendline Options (Located at the bottom of the dropdown list.)
- In the Trend/Regression Type section of the Format Trendline pane, choose a trendline.
- Check the Trendline Name section to make sure the name for your trendline is correct - if not, select the Custom option and in the Custom Text box type a name.
- In the Forecast section, use the Forward and Backward text boxes to specify how far ahead and how far behind you want to forecast and estimate respectively.
- Under Format Trendline in the Fill and Polygon Icons, choose options for line color, line style, shadow styles and glow effects.
- Click **[Close Icon]** (x) to close the pane.



Action 3.2 - Adding Trendlines



Instructions:		Results/ Comments:
1.	MyAdvancedCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Trendlines</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
3.	Select the first data series in the chart.	Click the blue data bar to make it active.
4.	On the <i>Design Tab</i> in the Chart Design Group , and click the [Add Chart Element] button drop-down and choose <i>Trendline</i> , <i>More Trendline Options</i>	The <i>Format Trendline</i> pane is displayed, showing the list of Trendline types and formatting controls.
5.	Choose the <i>Logarithmic Trendline</i> option.	The Trendline changes from a straight line to a curved line.
6.	Click the <i>Fill & Line</i> category under Trendline Options and choose <i>Solid</i> from the Line choices.	The color of the line changes to blue. You can change to color if you like.
7.	In the <i>Width</i> text box on the right side of the window, set the width to <i>1.5</i> .	The thickness of the line is doubled, making it easier to see.
8.	Click the [Close] button to the pane.	The Format Trendline pane closes.
9.	Click into a blank area of the chart .	To deselect the trendline.
10	. Repeat steps 4 and 5 to add a second trend line.	The <i>Add Trendline</i> dialog opens, displaying a list of all the data series in the chart.
11.	. Choose the <i>QTR</i> 2 series and click [OK] .	A new Linear Trendline is added to the second data series in the chart.
12	. Right-click the new trendline and choose Format Trendline from the menu.	The Format Trendline pane opens.
13	. Choose the <i>Logarithmic Trendline</i> option in the <i>Format Trendline Pane</i> .	The Trendline changes from a straight line to a curved line.



Instructions:

- 14. Click the *Fill & Line* category under **Trendline Options** and choose *Solid line*. From the *Color* drop-down choose the *Dark Red* option.
- 15. In the *Width* textbox on the right side of the window and change the width to *1.5*.
- 16. Click the **[Close]** button on the pane.
- 17. Repeat steps 10 through 16 to add Trendlines to the data series QTR 3 and then for QTR 4.
- 18. Click into a blank area of the chart.
- 19. Select and right-click the first trendline and choose *Format Trendline*.
- 20. In the *Format Trendline* pane locate the **Forecast Group**, set the **Forward** field value to 2 and click the **[Close]** button.
- 21. Save the file and leave it open.

Results/ Comments:

The color of the line changes to Dark Red.

The thickness of the line is doubled, making it easier to see.

The pane closes.

You have added a trendline for each data series in the chart. Set the colors of the lines to the same color as the data series.

To deselect all trendlines.

The Format Trendline pane opens.

The trendline now extents into two blank newly add years of the chart to predict possible future trends based on the current data of that data series.

[CTRL + S].

0

Error Bars

Error bars are used to express potential error amounts that are graphically relative to each data point or data marker in a data series. For example, you could show 5 percent positive and negative potential error amounts in the results of a scientific experiment:



Add Error Bars

Error bars can be added to all the data series or to individual data series in 2-D area, bar, column, line, xy (scatter), or bubble charts:

- To add error bars to all data series in the chart, click the chart area.
- Click the *Design Tab*. In the Chart Layouts Group, click on the [Add Chart Element] button.



- Solution Mouse-over *Error Bars* on the menu.
- From the Sub-menu, select a predefined error bar option, such as *Standard Error*, *Percentage*, or *Standard Deviation*.

(0)		
	Error	Rarc
	EIIUI	Dais,
	continue	ed

To add error bars to a selected data point or data series

- Click the data point or data series.
- Select the *Design Tab* and from the Chart Layouts Group, click [Add Chart Element] button.
- Mouse-over *Error Bars* in the menu and click a predefined error bar option, such as *Standard*, *Percentage*, or *Standard Deviation* from the sub-menu.

- OR -

- Click the chart area to make sure no data points are selected.
- Select the *Design Tab* and from the Chart Layouts Group, click [Add Chart Element] button.
- Select *Error Bars* and from the sub-menu, select *More Error Bars Options*.
- The Add Error Bar dialog will be displayed. Choose the desired data series you want to use.

Add Error Bars	? X
Add Error Bars ba	ased on Series:
Sales	
Expenses Income	
ОК	Cancel

The Error Bars are added to the Data Series selected. The dialog closes and the *Format Error Bars* pane is displayed.

Error Bars,

Modifying the Error Bar

You are able to modify the error amount, display, and formatting of error bars.

- Select the error bar and *right-click* the mouse.
- Choose Format Error Bars from the menu. You can also select the Design Tab, click the [Add Chart Element] Button and select More Error Bar Options....
- **♦** The *Format Error Bars* pane will be displayed.
- Make selections for Direction, End Style and Error Amount.

Format Error Bars			×
Error Bar Options 🔻			
Vertical Error Bar			
Direction			
○ <u>M</u> inus			
Ţ ○ P <u>I</u> us			
End Style			
○ <u>N</u> o Cap			
• C <u>a</u> p			
Error Amount			
<u>Fixed value</u>	50000.0]	
O Percentage	5.0	%	
 <u>S</u>tandard deviation(s) 	1.0		
 Standard <u>e</u>rror 			
○ <u>C</u> ustom	Specify <u>V</u>	alue	

Removing Error Bars

To remove error bars select the error bar and press the **[Delete]** key or from the **Error Bars** sub-menu choose *None*.



Instructions:		Results/ Comments:
1.	MyAdvancedCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Error Bars</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
3.	Select the chart.	Click on the chart to make it active. Once active, the <i>Chart Tools Tabs</i> are displayed on the ribbon.
4.	Select the <i>Design Tab</i> and from the Chart Layouts Group , click [Add Chart Element] button.	To display a menu of choices.
5.	Mouse-over <i>Error Bars</i> in the menu and choose <i>Standard Error</i> .	The Error Bars are added to each data point in the chart.
6.	Right-click one of the Error Bars and choose <i>Format Error Bar</i> from the menu.	The <i>Format Error Bars</i> pane opens displaying the <i>Vertical Error Bar</i> category.
7.	In the Error Amount Group of options click the radio button for <i>Percentage</i> and set the value to <i>10</i> .	You are changing the error margin to a set value of your choosing. Note the length of the Error Bar is increased.
8.	Click the <i>Fill & Line</i> category at the top of the pane and set the width to <i>1.5</i> .	The Error Bars are now thicker and more easily viewed.
9.	Click the [Close] button for the pane.	All the changes to the Error Bars are applied.
10	. Save the file and keep it open.	[CTRL S].

Combination Charts

Note If your chart is not already created, you can simply highlight your data and select the *Insert Tab*, and click the dropdown for the [**Insert Combo Chart**] button and make desired selection

Note The Secondary Axis can be added after the chart is created using *Format Tab,* Current Selection Group, [Format Selection] to display the Format Data Series Pane. Combination charts combine two or more chart types within a single chart, emphasizing relationships in information. By combining chart types and using secondary axis's will create visuals which make understanding data much easier.

When the range of values for different data series in the chart varies widely, or when you have mixed types of data, you can plot one or more data series from a different chart type on a secondary vertical (value) axis.

Create a Combination Chart

You can make combination charts with Column and Line, Column and Area, Bar and Area, and Bar and Line to name a few but the way the data is arranged plays a big role in the ability to create combination charts. The following instructions are for combining a Column and Line chart.

Select the Chart to change into a combination chart.

Click the *Design Tab* and from the **Type Group**. Click the **[Change Chart Type]** button.



- Choose Combo from the list of chart types and choose the type desired (Clustered Column - Line, Clustered Column - Line on Secondary Axis, Stacked Area -Clustered Column or Custom Combination).
- At the bottom of the dialog, select the Chart Type for each Series and choose if you want a series to be the Secondary Axis.
- ♦ Click **[OK]**.



Ir	istructions:	Results/ Comments:
1.	MyAdvancedCharts.xlsx file should still be open.	If not, re-open the file from the data files folder.
2.	Activate the <i>Combination Chart</i> sheet.	Click the sheet tab at the bottom of the spreadsheet.
3.	Select the first chart.	The red bars represent Average Price, this is the data series that will be plotted as a Line Chart on a secondary axis.
4.	Click the [Change Chart Type] button in the Type Group on the <i>Design Tab</i> .	The <i>Change Chart Type</i> dialog opens. Right-clicking the chart also offers the <i>Change Chart Type</i> option.
5.	Choose the <i>Combo</i> from the list of charts.	Custom Combination chart controls are displayed.
6.	Select the second type of combination chart from the top of <i>Change Chart Type</i> dialog.	The <i>Average Price</i> data set chart type is set as a <i>Line</i> chart and placed on a secondary axis.
7.	Change the Chart Type field of the <i>Homes Sold</i> data set.	The preview shows how those changes will be represented in the chart.
8.	Set the <i>Homes Sold</i> chart type to <i>Clustered Column,</i> the <i>Average Price</i> chart type as <i>Line,</i> and click the [OK] button.	The chart is converted.
9.	Click the [Chart Elements] button, scroll down to <i>Axis Titles</i> , expand the set of options, and check both <i>Primary</i> and <i>Secondary Vertical</i> checkboxes.	As the options are checked on, the object is added to the chart.
10	Right-click the right side axis and choose <i>Format Axis</i> from the menu.	The <i>Format</i> pane opens.
11.	In the <i>Axis Options</i> settings, set the Display units field to <i>Thousands</i> .	The word Thousands is added beside the axis values, helping better define the data on displayed on this axis.
12	Expand the <i>Number</i> formatting controls.	Located at the bottom of the <i>Axis Options</i> list of controls in the <i>Format</i> pane.


Instructions:	Results/ Comments:
13. Set the Category field to <i>Currency</i> and Set the Decimal places field to 0 .	The Axis now displays the values as currency, adding further clarity to the chart.
14. Select the right side axis title object and replace the existing text with: Average Price .	The secondary axis is now descriptively titled.
15. Change the font color to a similar orange as the data series.	With the object selected, go to the <i>Home Tab</i> and use the [Font Color] button to make changes.
16. Select the left axis title, replace the existing text with: Homes Sold .	The primary axis is now descriptively titled.
17. Change the font color to a similar blue as the data series.	
18. Click the [Chart Elements] button, uncheck the <i>Legend</i> checkbox.	The legend is remove from the chart.
19. Close the <i>Format</i> pane.	
20. Save the file.	[CTRL + S].



Tips and Notes

Excel: Charts Rel. 1.1, 1/14/2021



Appendix A: Gauge Charts

Lesson Overview

You will cover the following concepts in this chapter:

♦ Gauge Chart



Lesson Notes

Gauge Chart

Gauge charts or speedometer charts creating by combining a Doughnut chart and a Pie chart in a single chart. They require two separate data sets, the first will be used by the doughnut chart while the second is used for the pie chart on a second axis.

The first data set's values should total 360, this represents the 360 degrees of a circle. The last value in this set should be 180, this represents the bottom half of the doughnut chart which has no fill, giving the impression the doughnut chart is in fact a half circle dial face. The first value should be 0, as the starting point of the dial. The remaining values are used to break the dial into whatever sections the dial is to display.

The second data set will also involve a 360 value to location the dial pointer. This requires three values:

- First is the value you want represented by the pointer.
- Second is used to determine the width of the pointer (1 equals 1 degree of width).
- Third is used to establish the locaion of the pointer. Consider using the formula:
 =360-(first value + second value).

Gauge Ranges						
Dail Colors	Dial Values	Needle Location				
Red	15	35	Data point value			
Orange	25	1	size of pointer			
Yellow	53	324	location of pointer			
Green	87	^				
bottom half of doughnut	180					
Total Degrees	360					
	\wedge					
The dial color values a total 360 with the fina being 180. The final va no fill which creates t of a half circle dial.	should al value alue uses she illusion	The location of = 360-(Pointer The data point containing an a	f point cell uses the f range cell + size of p value cell can be a li actual value.	ormula o inter cell) nk to anoth	er cell	

Both charts will require some simple modifications to give the look of a dial gauge. Text elements defining the gauge ranges or other information you may want to add to the chart will be done by inserting text-boxes.

Creating Gauge Charts

- Create the data set to represent the scale needed in the gauge face of the chart.
- Create the data set used to place the point on the gauge face.
- Select the numeric values of the first data set, no text values. These data sets can be beside each other or use the [Ctrl] to select in a noncontinuous manner.
- On the *Insert Tab* in the Charts Group, click the [Combo Charts] button drop-down and choose *Create Custom Combo Chart....*



♦ In the *Insert Chart* dialog:

Insert Chart			? <mark>×</mark>
Recommended Charts A	II Charts		
Recent Templates Column Column	Custom Combinatio	n Lipe	
© Pie E Bar Marea X Y (Scatter) Lai Stock Ø Surface ★ Radar Treemap	550 500 200 150 100 50 0 1 2 2	Chart Title	
Histogram	Choose the chart type and	Series1 ——Series2 axis for your data series:	Secondary Avis
Waterfall	Series1	Clustered Column	•
			OK Cancel

- Set the **Series1** chart type to *Doughnut*.
- Set the Series2 chart type to *Pie* and click the Secondary Axis checkbox
- Click the **[OK]** button.
- Use the [Chart Element] button to remove the Chart Title, Legend, or any other chart elements by unchecking them.
- Right-click on the chart and choose *Format Chart Area* from the menu.

Gauge Chart, continued

\$ Click the drop-down for <i>Chart Options</i> and choose the
<i>Serie2</i> option, if necessary click the [Series Options]
button.

- Set the **Angle of the first slice** to 270.
- Click the **[Fill & Line]** button in the *Format* pane.
- Click the large green data point and set the Fill to *None*. Use your right arrow key to move to the next data point of the pie chart and set the Fill to *None*. Use the Right Arrow key again to select the pointer data point and set the Fill to *Black*.
- Click the drop-down for *Chart Options* and choose the *Serie1* option, if necessary click the [Series Options] button.
- Set the **Angle of the first slice** to 270.
- Click the **[Fill & Line]** button in the *Format* pane.
- Click on the bottom slice of the doughnut and set the Fill category to *None*. Use your right arrow key to move to the next data point of the pie chart and set the Fill to *Solid fill* then use the color picker to assign the desired color. Keep using the Arrow key to move from one data point to the next until all the data points are formatted.
- Add text-boxes to define the gauge value ranges, if needed.
- Change the value of cell C3, the pointer value cell, to change the position of the dial.

Action 3.5 - Creating a Gauge Chart



Iı	nstructions:	Results/ Comments:
1.	Select the <i>Gauge Chart sheet</i> .	
2.	Select the cells B3:C7 .	In this data set, the Doughnut series has 5 data points and the Pie series has 3 data points.
3.	On the Insert Tab, in the Charts Group , click the [Combo Chart] button drop-down and choose <i>Create Custom Combo Chart</i>	The Insert Chart dialog opens.
4.	Set the Series1 chart type to <i>Doughnut</i> , set the Series2 chart type to <i>Pie</i> , set the Secondary Axis checkbox check to <i>Series2</i> and click the [OK] button.	There should be a check in the Secondary Axis checkbox, you may have to click it twice. The Pie Chart is displayed above the Doughnut Chart and you are ready to begin formatting the charts.
5.	Click the [Chart Elements] button to the right of the chart.	The list of active and available elements are displayed.
6.	Uncheck any actively checked checkboxes and click the [Chart Elements] button again.	All the chart elements are removed and the list of elements is collapsed.
7.	Right-click in the chart area and choose <i>Format Chart Area</i> or whatever <i>Format</i> option is available.	The <i>Format</i> pane opens
8.	Click the drop-down below the pane title and choose <i>Series 1</i> from the menu.	The options for Series 2 (the Pie Chart) are displayed.
9.	Click the [Series Options] button and set the Angle of first slice field to 270 .	The chart is rotated 270°.
10	. Select the green data point and click the [Fill & Line] button.	The <i>Fill & Line</i> options are displayed in the <i>Format</i> pane.



Instructions:	Results/ Comments:
11. Set the <i>Fill</i> to <i>None</i> , select the next data point of the pie chart and set the <i>Fill</i> to <i>None</i> . Set the next data point and set the fill to Black.	The only part of the Pie Chart still visible is the pointer. If you can not click to select the data point use the [Ctrl] key and tap the left or right arrow key to change the selection.
12. Click the drop-down below the pane title and choose <i>Series 1</i> from the menu.	The options for Series 1 (the Doughnut Chart) are displayed.
13. Click the [Series Options] button and set the Angle of first slice field to 270 .	The chart is rotated 270°.
14. Select the large blue bottom data point and click the [Fill & Line] button.	Use the [Ctrl arrow] keys to select the next part to modify.
15. Set the <i>Fill</i> to <i>None</i> , hold the [Ctrl] key and tap the left arrow key to select the next data point of the doughnut; set the fill to <i>Red</i> and [Ctrl arrow] key over to the next data point; set the fill to <i>Orange</i> and [Ctrl arrow] key over to the next data point set the fill to <i>Yellow</i> and [Ctrl arrow] key over to the next data point set the fill to <i>Green</i> .	The visible part of the Doughnut Chart is formatted. *If you end up re-selecting the Pie chart, hold the [Ctrl] key down and tap the left and right arrow keys to change selection.
16. Change the value in cell C3 to 120 .	As the pointer value cells' value is changed, the pointer moves along the chart.
17. Save and close the file.	[Ctrl + S] and [Ctrl + W].

 \odot

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis	with
PowerPivot	PPT

MICROSOFT OFFICE EXCEL ASSOCIATE EXAM MO-200

Import data into workbooks	
Import data from .txt file	DA
Import data from .csv files	DA

Navigate within workbooks		
Search for data within a workbook	L-1	
Navigate to named cells, ranges, or workbook elements	L-2	
Insert and remove hyperlinks	L-3	

Format worksheets and workbooks		
Modify page setup	L-1	
Adjust row height and column width	L-1	
Customize headers and footers	L-1	

Customize options and views		
Customize the Quick Access toolbar	L-1	
Display and modify workbook content in different views	L-2	
Freeze worksheet rows and columns	L-2	
Change window views	L-2	
Modify basic workbook properties	L-2	
Display formulas	L-1	

Configure content for collaboration			
Set a print area	L-1		
Save workbooks in alternative file formats	L-1		
Configure print settings	L-1		
Inspect workbooks for issues	L-1		

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis	with
PowerPivot	PPT

Manipulate data in worksheets	
Paste data by using special paste options	L-1
Fill cells by using Auto Fill	L-1
Insert and delete multiple columns or rows	L-1
Insert and delete cells	L-1

Format cells and ranges			
Merge and unmerge cells	L-1		
Modify cell alignment, orientation, and indentation	L-1		
Format cells by using Format Painter	L-1		
Wrap text within cells	L-1		
Apply number formats	L-1		
Apply cell formats from the Format Cells dialog box	L-1		
Apply cell styles	L-1		
Clear cell formatting	L-1		

Define and reference named ranges		
Define a named range	L-2 / FM	
Name a table	DA	

Summarize data visually		
Insert Sparklines	L-2	
Apply built-in conditional formatting	L-2	
Remove conditional formatting	L-2	

Create and format tables	
Create Excel tables from cell ranges	L-2
Apply table styles	L-2
Convert tables to cell ranges	L-2

Modify tables	
Add or remove table rows and columns	L-2
Configure table style options	L-2
Insert and configure total rows	L-2

 \odot

TCW BOOK

_	-	-	-	-	
	~	\sim 1	<u> т</u>		
(()) F	S -	
· ·	\sim				

L-1
L-2
L-3
FM
DA
CH
PT
with
PPT

Filter and sort table data	
Filter records	L-2
Sort data by multiple columns	L-2

Insert references			
Insert relative, absolute, and mixed references	L-1		
Reference named ranges and named tables in formulas	L-2		

Calculate and transform datas	
Perform calculations by using the AVERAGE(), MAX(), MIN(), and SUM() functions	L-1
Count cells by using the COUNT(), COUNTA(), and COUNTBLANK() functions	DA
Perform conditional operations by using the IF() function	FM

Format and modify text	
Format text by using RIGHT(), LEFT(), and MID() functions	DA
Format text by using UPPER(), LOWER(), and LEN() functions	DA
Format text by using the CONCAT() and TEXTJOIN() functions	DA

Create charts	
Create charts	L-2 / CH
Create chart sheets	L-2 / CH

Modify charts	
Add data series to charts	L-2 / CH
Switch between rows and columns in source data	L-2 / CH
Add and modify chart elements	L-2 / CH

Format charts	
Apply chart layouts	L-2 / CH
Apply chart styles	L-2 / CH
Add alternative text to charts for accessibility	L-2 / CH

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis	with
PowerPivot	PPT

MICROSOFT OFFICE EXCEL EXPERT EXAM MO-201

Manage workbooks	
Copy macros between workbooks	L-3
Reference data in other workbooks	L-3
Enable macros in a workbook	L-3
Manage workbook versions	L-2

Prepare workbooks for collaboration	
Restrict editing	L-2
Protect worksheets and cell ranges	L-2
Protect workbook structure	L-2
Configure formula calculation options	FM
Manage comments	L-2

Use and configure language options	
Configure editing and display languages	L-1
Use language-specific features	L-1

Fill cells based on existing data	
Fill cells by using Flash Fill	L-1
Fill cells by using advanced Fill Series options	L-2

Format and validate data	
Create custom number formats	L-1
Configure data validation	L-3 / FM
Group and ungroup data	L-3
Calculate data by inserting subtotals and totals	L-3
Remove duplicate records	DA

 \bigcirc

0

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis	with
PowerPivot	PPT

Apply advanced conditional formatting and filtering	
Create custom conditional formatting rules	L-2
Create conditional formatting rules that use formulas	L-2
Manage conditional formatting rules	L-2

Perform logical operations in formulas	
Perform logical operations by using nested functions including the IF(), IFS(), SWITCH(),	FM
SUMIF(), AVERAGEIF(), COUNTIF(), SUMIFS(), AVERAGEIFS(), COUNTIFS(), MAXIFS(),	FM
MINIFS(), AND(), OR(), and NOT() functions	FM

Look up data by using functions	
Look up data by using the VLOOKUP(), HLOOKUP(), MATCH(), and INDEX() functions	FM

Use advanced date and time functions	
Reference date and time by using the NOW() and TODAY() functions	FM
Calculate dates by using the WEEKDAY() and WORKDAY() functions	FM

Perform data analysis	
Summarize data from multiple ranges by using the Consolidate feature	L-3
Perform what-if analysis by using Goal Seek and Scenario Manager	L-3
Forecast data by using the AND(), IF(), and NPER() functions	FM
Calculate financial data by using the PMT() function	FM

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis	with
PowerPivot	PPT

Troubleshoot formulas	
Trace precedence and dependence	FM
Monitor cells and formulas by using the Watch Window	FM
Validate formulas by using error checking rules	FM
Evaluate formulas	FM

Create and modify simple macros	
Record simple macros	L-3
Name simple macros	L-3
Edit simple macros	L-3

Create and modify advanced charts	
Create and modify dual axis charts	CH
Create and modify charts including Box &	
Whisker, Combo, Funnel, Histogram, Map,	CH
Sunburst, and Waterfall charts	

Create and modify PivotTables	
Create PivotTables	PT
Modify field selections and options	PT
Create slicers	PT
Group PivotTable data	PT
Add calculated fields	PT
Format data	PT

Create and modify PivotCharts	
Create PivotCharts	PT
Manipulate options in existing PivotCharts	PT
Apply styles to PivotCharts	PT
Drill down into PivotChart details	PPT

 \odot