Microsoft Excel Part 2:

Charts and Graphs

Creating Charts in Excel

Here's a worksheet that shows how many cases of Northwind Traders Tea were sold by each of three salespeople in each of three months. You need a chart that shows how each salesperson compares against the others, month by month for the first quarter of the year.

Select the data that you want to chart, including the column titles (January, February, March) and the row labels (the salesperson names).

Then click the **Insert** tab, and in the **Charts** group, click the **Column** button. You could select another chart type, but column charts are commonly used to compare items and will get your point across.

After you click **Column**, you'll see a number of column chart types to choose from. Click **Clustered Column**, the first column chart in the **2-D Column** list. A ScreenTip displays the chart type name when you rest the pointer over any chart type. The ScreenTip also provides a description of the chart type and gives you information about when to use each one.

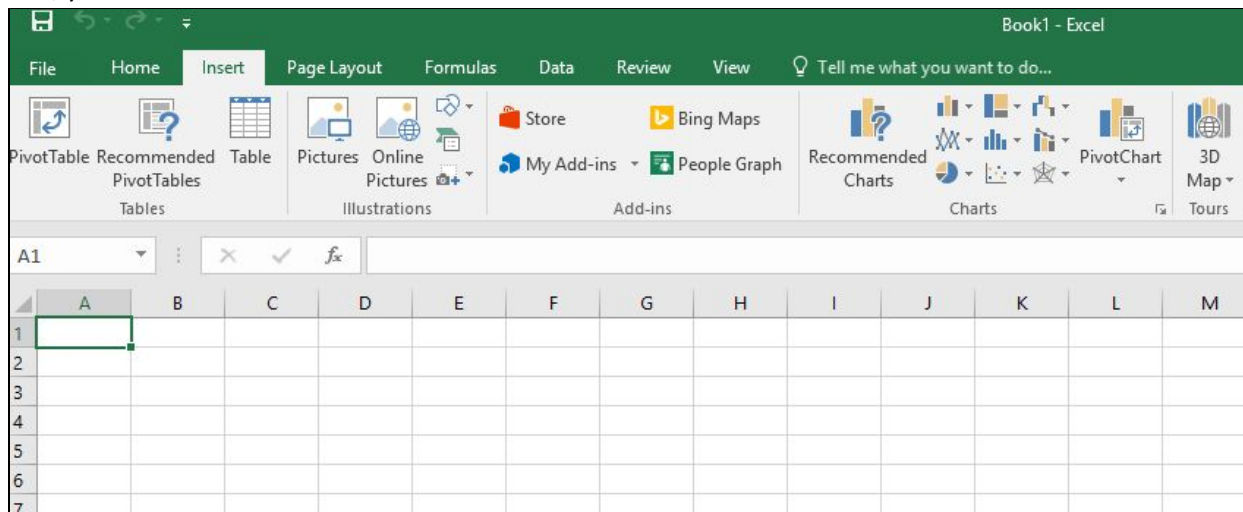That's it, you've created a chart in about 10 seconds.

Figure 1: Microsoft Excel

Tip   If you want to change the chart type after you create your chart, click inside the chart. On the **Design** tab under **Chart Tools**, in the **Type** group, click **Change Chart Type**, and select another chart type.

As you can see at once in this column chart, Cencini (represented by the middle column for each month) sold the most tea in January and February, but she was outdone by Giussani in March.
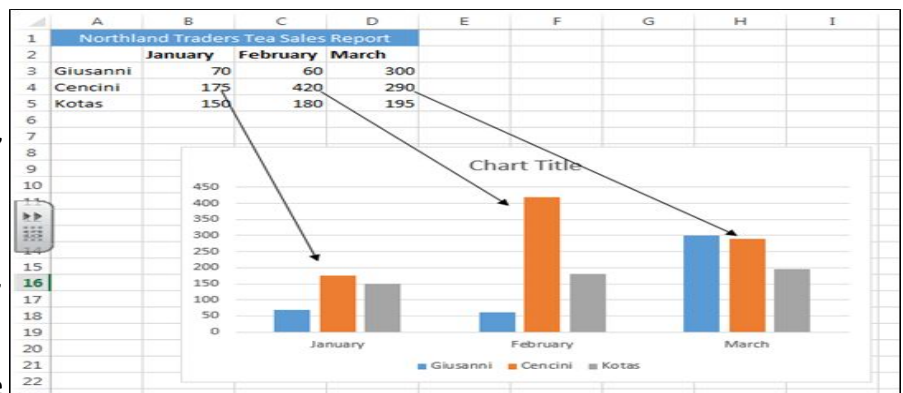
Figure 2: Microsoft Excel Chart

Data for each salesperson appears in three separate columns, one for each month. The height of each chart is proportional to the value in the cell that it represents. The chart shows you how the salespeople stack up against each other, month by month.

Each row of salesperson data has a different color in the chart. The chart legend, created from the row titles in the worksheet (the salesperson names), tells which color represents the data for each salesperson. Giussani data, for example, is the dark blue, and is the left-most column for each month.

The column titles from the worksheet, January, February, and March, are now at the bottom of the chart. On the left side of the chart, Excel has created a scale of numbers to help you to interpret the column heights.

Tip   Any changes that you make to the worksheet data after the chart is created are instantly shown in the chart.

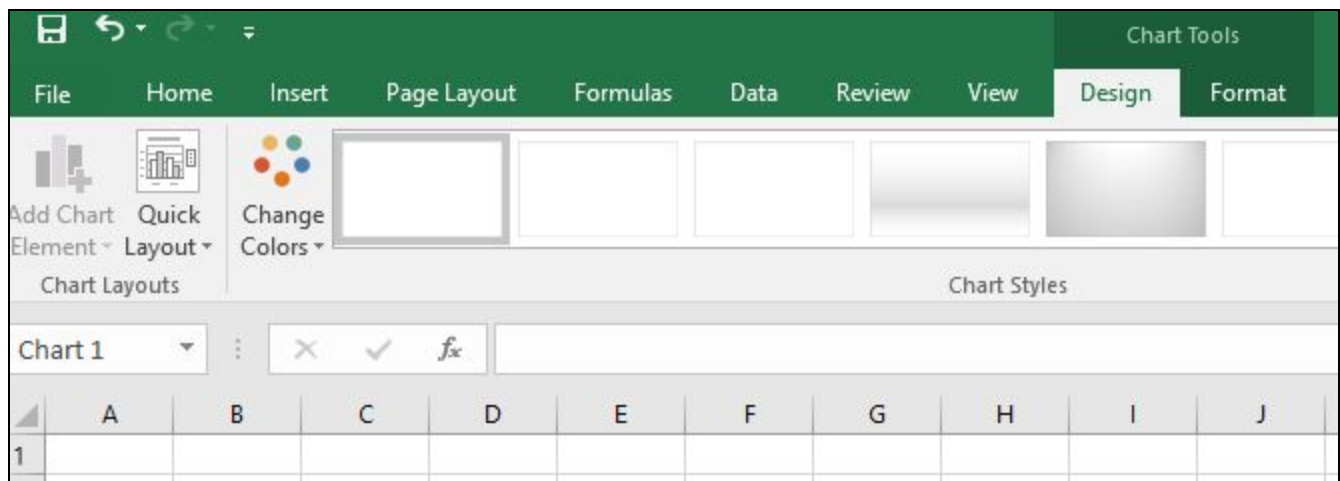When you create a chart, **Chart Tools** appear on the Ribbon, which include the **Design** and **Format** tabs.

Change the Chart View

Figure 3: Microsoft Excel Ribbon

You can do more with your data than create one chart. You can make your chart compare data another way by clicking a button to switch the chart view from one view to another.

The chart you created compares salespeople to each other. Excel grouped data by worksheet columns and compared worksheet rows to show how each salesperson compares to the others. This is shown on the left side in the chart above.
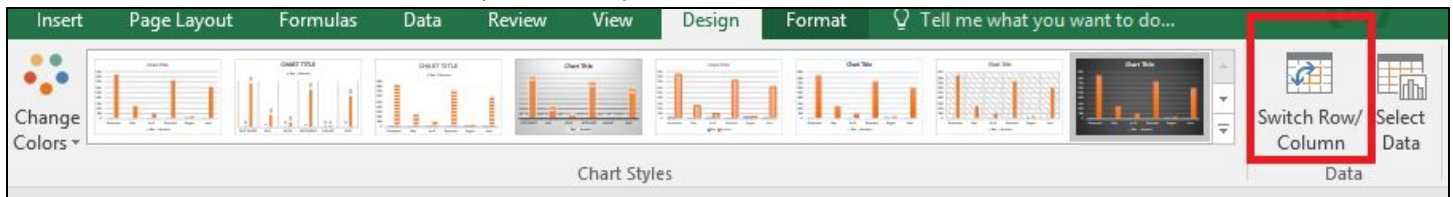

Figure 4: Microsoft Excel Ribbon

But another way to look at the data is to compare sales for each salesperson, month over month. To create this view of the chart, click **Switch Row/Column** in the **Data** group on the **Design** tab. In the chart on the right, data is grouped by rows and compares worksheet columns. Now the chart says something different: It shows how each salesperson did, month by month compared against themselves.

You can Switch the chart back to the original view by clicking **Switch Row/Column** again.

Tip   To keep both views of the data, select the second view of the chart, copy it, and then paste it on the worksheet. Then switch back to the original view of the chart by clicking in the original chart and clicking **Switch Row/Column**.

Add Chart Titles

It's a good idea to add descriptive titles to your chart, so that readers don't have to guess what the chart is about. You can give a title to the chart itself, as well as to the chart axes, which measure and describe the chart data. This chart has two axes. On the left side is the vertical axis (also known as the value or y axis). This axis is the scale of numbers by which you can interpret the column heights. The months of the year at the bottom are on the horizontal axis (also known as the category or x axis).

A quick way to add chart titles is to click the chart to select it and then go to the **Design** tab and locate **Quick Layout** in the **Chart Layouts** group. Each option shows different layouts that change the way chart elements are laid out.
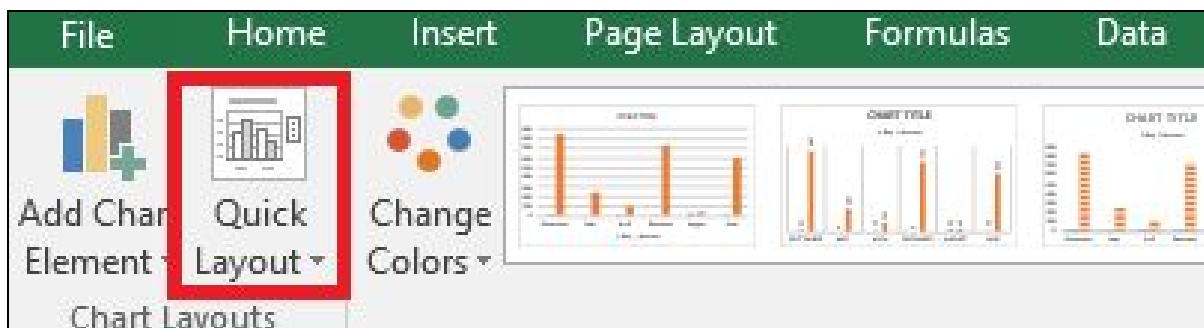

Figure 5: Microsoft Excel Ribbon

The figure shows **Layout 9**, which adds placeholders for a chart title and axes titles. You type the titles directly in the chart.
    The title for this chart is Northwind Traders Tea, the name of the product.
    The title for the vertical axis on the left is Cases Sold.
    The title for the horizontal axis at the bottom is First Quarter Sales.

Tip Another way to enter titles is on the **Design** tab, in the **Chart Layouts** group. There you can add titles by clicking **Add Chart Element** and **Axis Titles**.
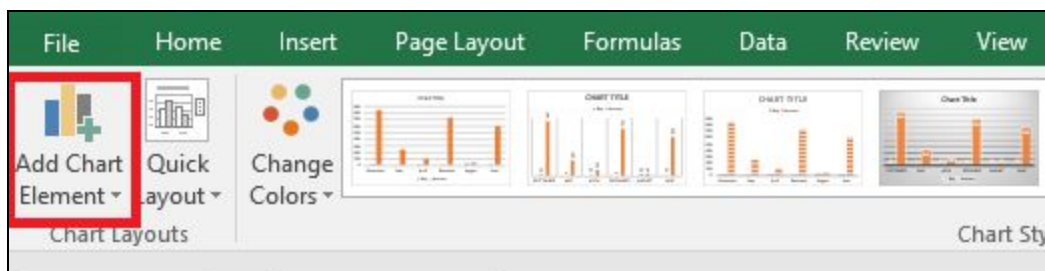

Figure 6: Microsoft Excel Ribbon

Change How Your Chart Looks

After you create your chart, you can customize it to give it a more professional design. You can change the look of your chart by selecting a new chart style, which quickly changes the chart colors.

When you first create your chart, it's in a standard color. By using a chart style, you can apply different colors to a chart in just seconds.

Click in the chart. Then on the **Design** tab, in the **Chart Styles** group, click the **More** button to see all the choices, and then click the style you want. Some of the styles change just the color of the columns. Others change the color and add an outline around the columns, while other styles add color to the plot area (the area bounded by the chart axes), and some styles add color to the chart area (the entire chart).

Figure 7: Microsoft Excel Design Ribbon

If you don't see what you want in the **Chart Styles** group, you can get other color choices by selecting a different **theme**. Click the **Page Layout** tab and then click **Colors** in the **Themes** group. When you rest the pointer over a color, the color is shown in a temporary preview on the chart, which is different from what happens when you look at a chart style. You see the color's effect before you apply it, saving you the step of undoing it if you don't like it. Click the one you like to apply it to the chart.
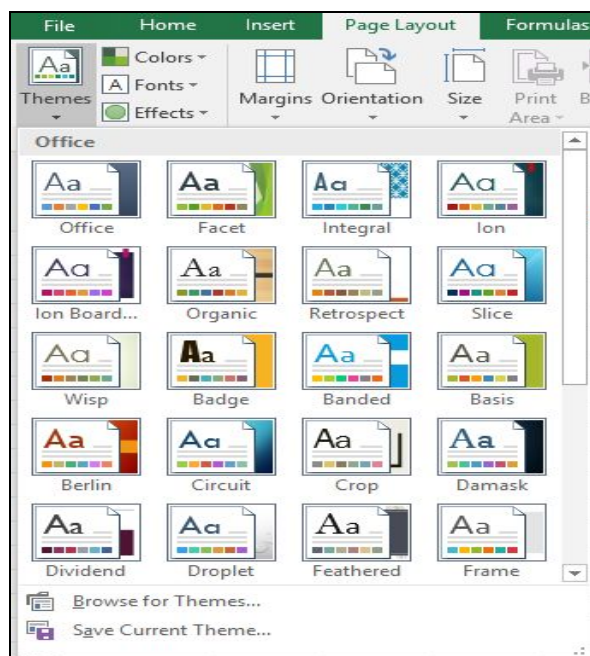

Figure 8: Theme options

Important   Unlike a chart style, the colors from a theme will be applied to other elements you might add to the worksheet. For example a table, or a cell style such as a heading, will take on the colors of the theme applied to the chart.

Format Chart Titles

If you'd like to make the chart or axis titles stand out more, that's easy to do, too. On the **Format** tab under **Chart Tools**, in the **WordArt Styles** group, there are many ways to work with the titles. In the picture, a text fill, one of the options in the group, has been added to change the color.

To use a text fill, first click in a title area to select it. Then click the arrow on **Text Fill** in the **WordArt Styles** group. Rest the pointer over any of the colors to see the changes in the title. When you see a color you like, select it. **Text Fill** also includes options to apply a gradient or a **texture** to a title. Other options in the **WordArt Styles** group include **Text Outline** and **Text Effects**, which include **Shadow**, **Reflection**, and **Glow** effects.
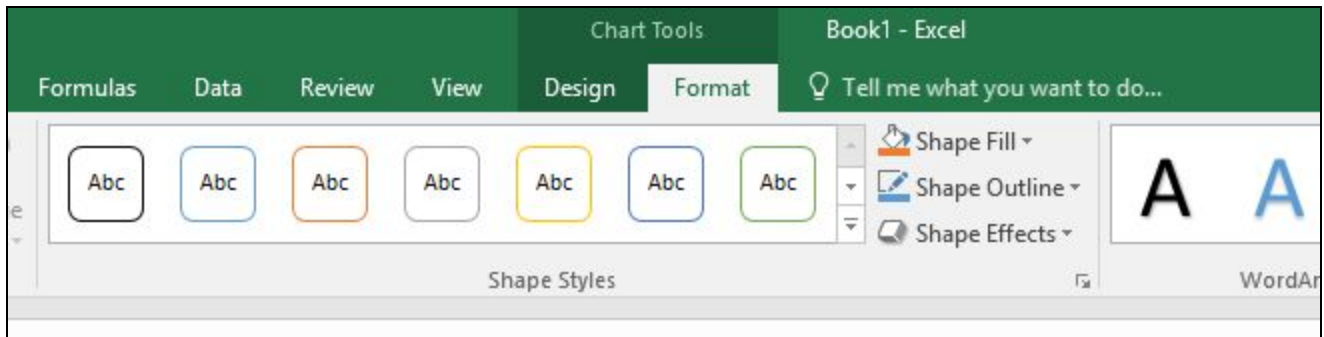

Figure 9: Microsoft Excel Ribbon

To make font changes, such as making the font larger or smaller, or to change the font face, click **Home**, and then go to the **Font** group. Or you can make the same formatting changes by using the **Mini toolbar**.

The **Mini toolbar** appears in a faded fashion after you double-click and select the title text. Point at the toolbar and it becomes solid, and then you can select a formatting option.

Format Individual Columns

In the picture, you can add a shadow effect to each of the columns (an offset diagonal top left shadow is behind each column). To do this, you click on one of Giussani's columns. That will select all three columns for Giussani (known as a series).

On the **Format** tab, in the **Shape Styles** group, you click the arrow on **Shape Effects**, point to **Shadow**, and then rest the pointer on the different shadow styles in the list. You can see a preview of the shadows as you rest the pointer on each style. When you see one you like, select it.
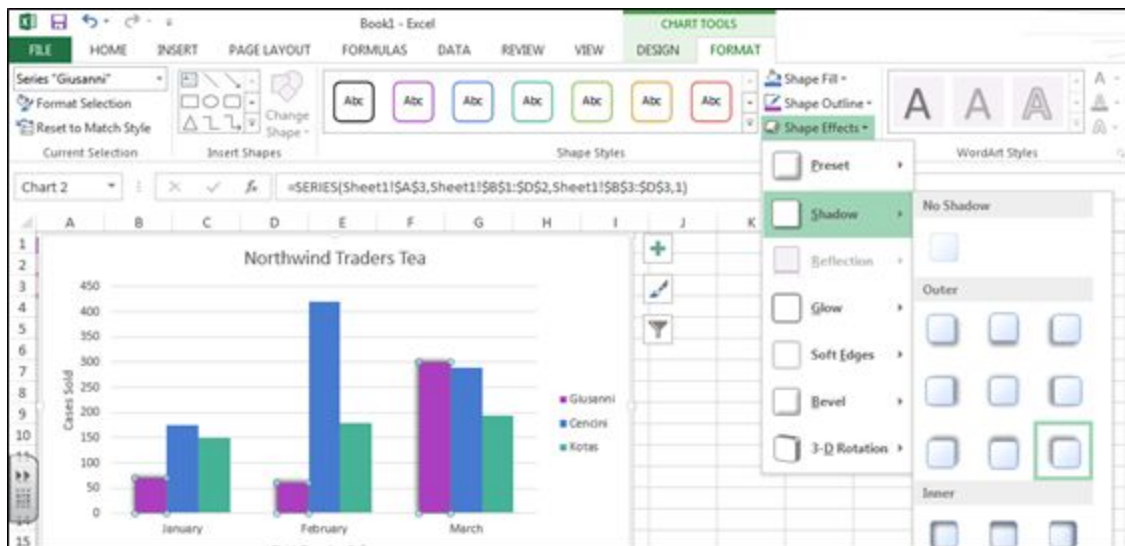
Figure 10: Microsoft Excel Chart Tools

Next, you click on one of Cencini's columns to select all three of those columns and follow the same steps. Then do the same for Kotas. All this takes only a moment or so to do. You'll have a chance to try it in the practice.

There are more options in **Shape Styles** that you can choose from. For example, click **Shape Fill**, where you can add a gradient or a texture to the columns. Click **Shape Outline** to add an outline around the columns. And **Shape Effects** offers more than shadows. For example you can add bevel effects, preset and soft edges to columns, or even make columns glow.

Add your Chart to a PowerPoint Presentation

1. Copy the chart in Excel.
2. Open PowerPoint 2016.
3. On the slide you want the chart to be on, paste the chart.
4. In the chart's lower-right corner the **Paste Options** button appears. Click the button. You'll see that **Chart (linked to Excel data)** is selected. That ensures that any changes to the chart in Excel will automatically be made to the chart in PowerPoint. Now you are ready to present your chart!

Figure 11: Microsoft Excel Charts

Choosing a Chart Type

Different charts emphasize different data. For example, a **stacked column chart** (see below) compares the contributions to a total that consists of different values, showing either units or percentages.
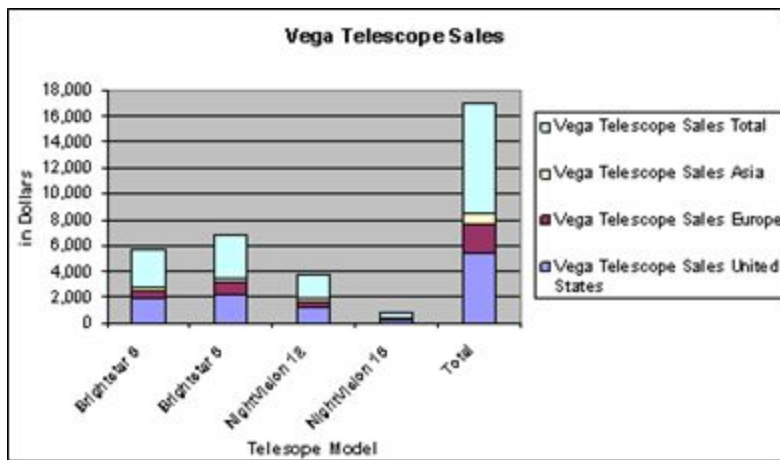
Figure 12: Microsoft Excel stacked column chart

A *Pie chart* is designed to show comparisons within a single set of values, and to show how parts contribute to a whole.
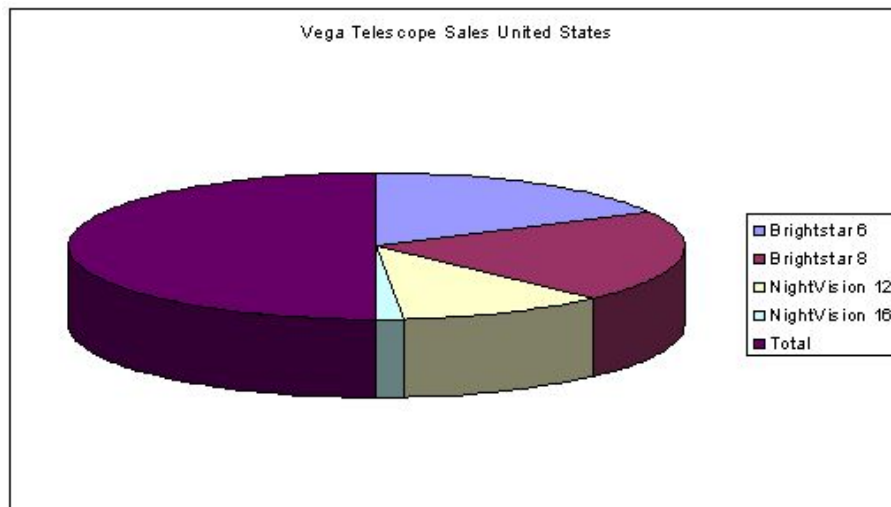

Figure 13: Microsoft Excel pie chart

A *Line chart* (see below) is the best way to show trends and changes over time. Use a Line chart if you want dates on the bottom of the chart, to make historical developments visible at a glance. Line charts usually have only one set of numbers, shown on the vertical axis.
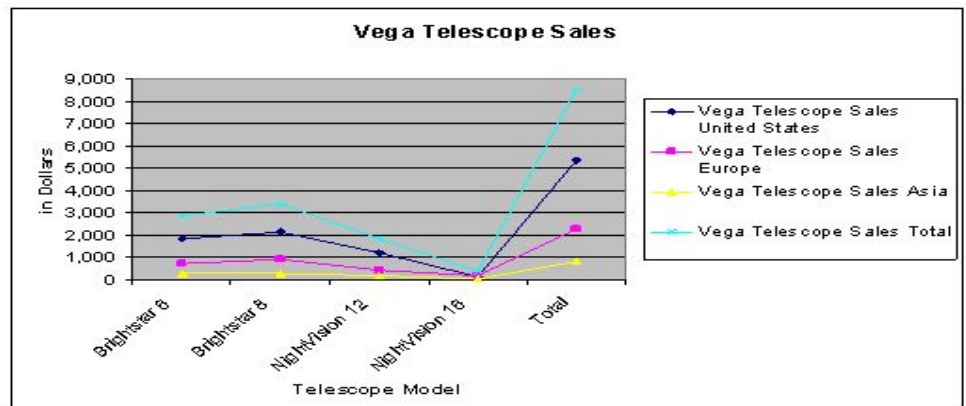

Figure 14: Microsoft Excel line chart

An *XY Scatter chart* compares two sets of numbers at once, one on the horizontal X axis, one on the vertical Y axis. The data values are scattered across the chart. You have the option of connecting the values with lines, but those lines don't show trends over time.
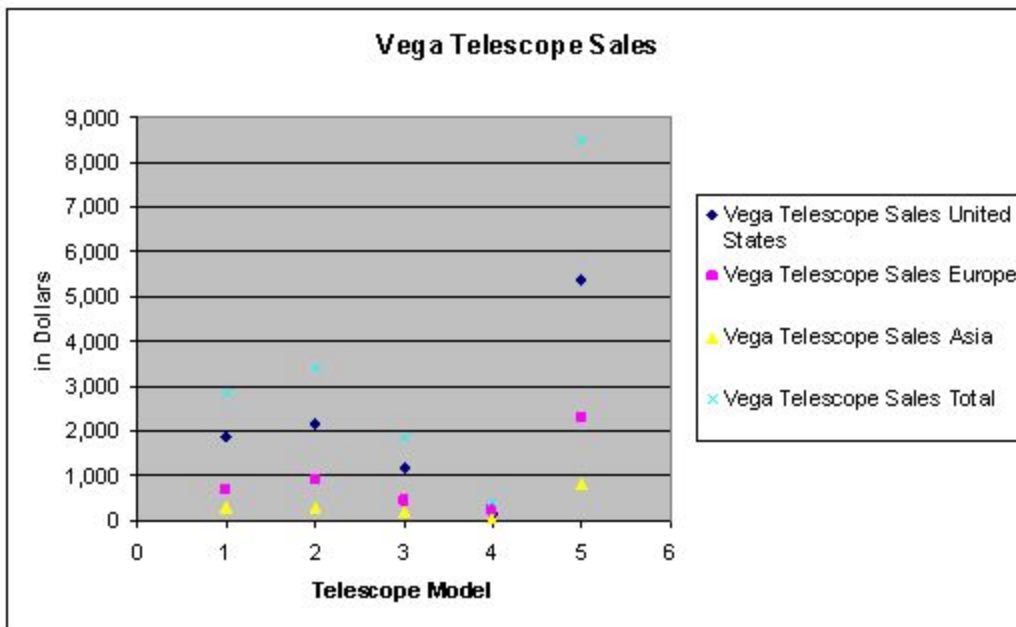
Figure 15: Microsoft Excel XY Scatter chart

XY Scatter charts are good for showing comparisons of numbers such as scientific or statistical data, where several measurements need to be plotted on a single chart. If you wanted to show how many cases of flu occurred in various age groups, or the average incomes in cities of various sizes, an XY Scatter chart would be an effective type.

Adding a Sparkline

Sparklines permit the user to display general trends within one's data without having to produce a full-blown chart or graph. Sparklines are essentially a mini-graph contained in a single cell representative of the proceeding cells in that corresponding row.

To add a sparkline simply refer back to your original data, go to the **insert** tab, in the **Sparklines** group and select either a **line, column or win/loss** sparkline by clicking on the appropriate icon.
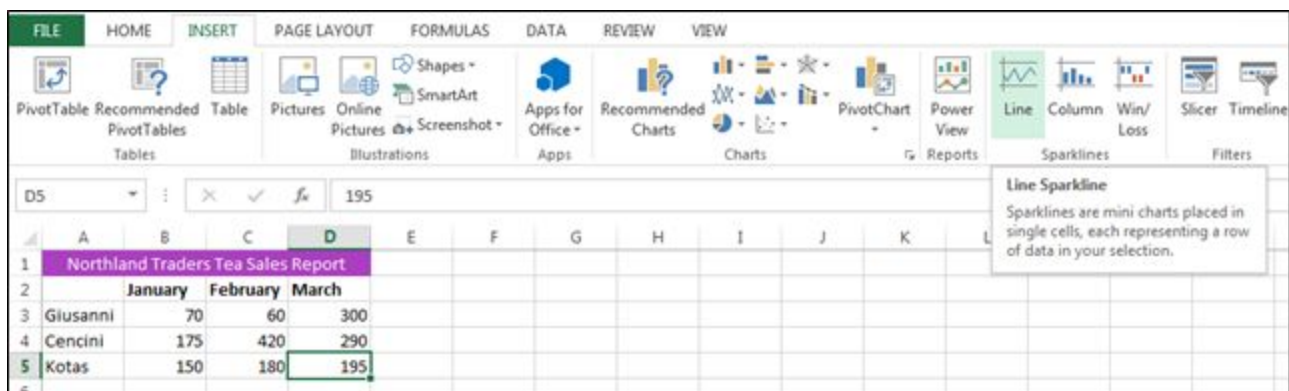

Figure 16: Microsoft Excel Ribbon

After you have selected the sparkline to add a "Create Sparklines" dialog box will appear prompting you to select the "Data Range" and "Location Range." For the "Data Range," make sure your cursor is blinking in the data range box and click and drag over the data you want to select and release. You should see the "Data Range" box is now populated with the cells previously selected. Next, is the "Location Range" this is where you will select where you want the Sparklines to be placed. Again, make sure your cursor is blinking in the Location Range box, click and drag over the cells and release. The "Location Range" box will be automatically populated.
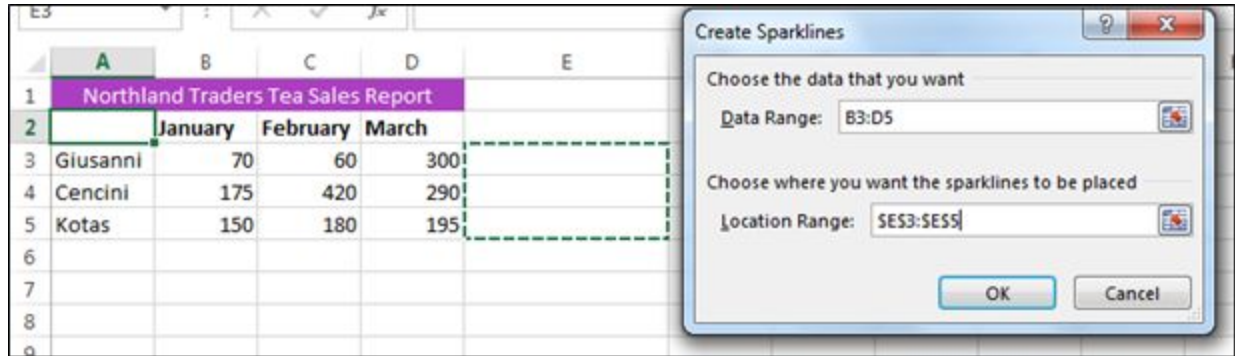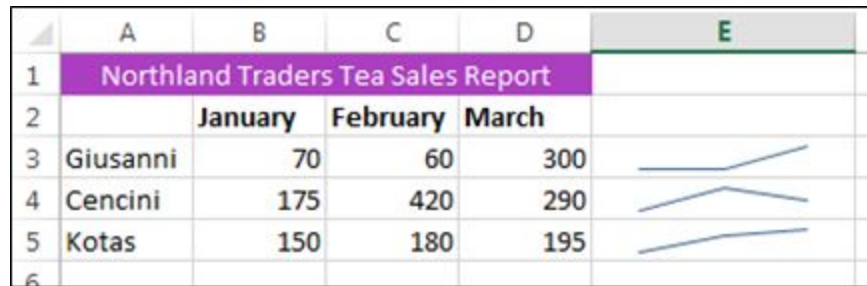
Figure 17: Microsoft Excel

Click **OK**.

Figure 18: Microsoft Excel

The Sparklines will appear in the cells previously selected. A new toolbar will also appear called "Sparkline Tools."

Sparkline Tools

Figure 19: Microsoft Excel Sparkline Tools

Under the Sparkline Tools tab you have numerous options. You may change the type of Sparkline by going to the Type group and selecting either, line, column or win/loss. It may also be helpful to add high or low points to give the

Sparkline a little more clarity. To do this, go to the show group and select one of the six options.

You may also change the color by clicking on the downward arrow in the **style** group and selecting a new color OR go to the **Sparkline Color** icon just to the right and select a color. If you choose to add high or low points, a marker color can make those points stand out. To change the **Marker Color** go to the **style** group and click on the marker color icon. Select the color and you will see the points now distinguished on the screen.

Resize and Move an Embedded Chart

An embedded chart is an object that you can move, resize or copy. Select the embedded chart to make it active; the selection handles will appear.
To resize the chart:
·   Drag the selection handles to increase or decrease the size of the chart
·   To keep the chart proportions the same as you resize, hold the Shift key as you drag one of the selection handles
·   To move the chart, make it active and then move the pointer over a blank area. Click and drag the embedded chart to the new location and release the mouse button

Moving and Resizing Tips

When you select the chart to make it active, be sure you have selected the entire chart, not just one element.

You will be able to tell by the selection handles, which will appear at the outermost edges of the chart
When you move the pointer over a blank area of the chart after you have selected it, you should see the label Chart Area appear. These tips will help you select and move the entire chart, and not just one of its elements.

Data of the Chart is Linked to the Chart

A chart is linked to the data in the worksheet. If you change data in the worksheet that appears on the chart, Excel will automatically update the chart with the new information. This is the case for data values and also category labels.

Modify the Properties of Your Charts

After you create a chart, you can edit the data that is used in the chart by changing it in the data source worksheet cells. If you wanted to remove a data series from all categories, you could delete that particular data series from the worksheet in many cases.

Add a Graphic to a Chart

·   You can set a graphic image as a background for a chart using the **Illustrations** group on the **Insert** tab. This can be done for a data marker, but is often more appropriate for a larger portion of the chart itself, such as the plot area.
·   You could also place graphics within the data markers, such as the columns in a Column chart.
·   You can choose to stretch the graphic over the entire size of the column, or choose to stack the graphic up to the height of the column.

Change the Axis Scale

There are four values that comprise the y-axis scale: the minimum, maximum, major unit, and minor unit.

·   The minimum and maximum values are the smallest and largest tick marks that will appear on the axis.

·   The major unit is the increment between the scale's tick marks.

·   The chart has a second set of tick marks, called the minor tick marks, which may or may not be displayed; if shown, their positioning is determined by the minor unit setting.

·   Major tick marks are displayed alongside an axis value, whereas minor tick marks, if present, are not alongside an axis value.

 The **Format Axis** (Horizontal) dialog box is shown in this figure. It will be located on the right side of your excel document.
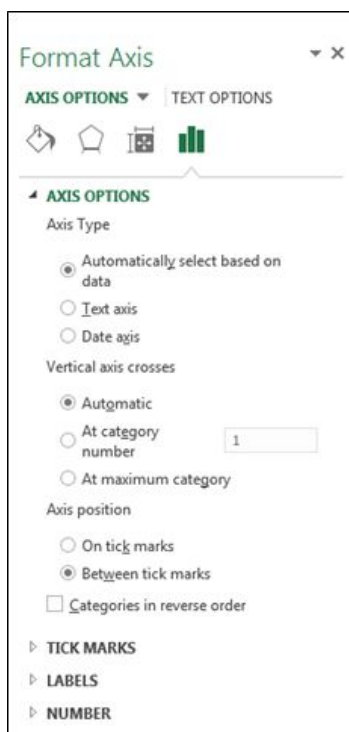
Figure 20: Microsoft Excel Format Axis

Freeze Rows and Columns in a List

When you scroll through large amounts of data in a worksheet, you can move data off the screen. If you prefer to have portions of data remain on the screen at all times, such as the column and/or row headings, you can freeze a portion of the list so that it remains while the rest of the data scrolls.
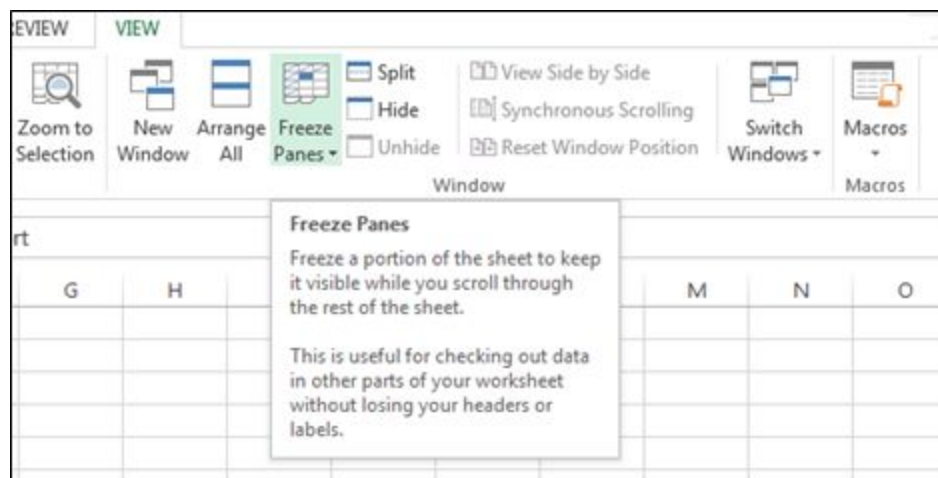
Figure 21: Microsoft Excel Ribbon

To freeze rows and columns: 1) Click in a cell to select it, 2) Select the **Window** group from the **View** tab, 3) Click on **Freeze Panes**.

Excel will display dark vertical and horizontal lines to indicate the rows and columns that are frozen.

Unlock Specific Cells in Excel

There is a way to have certain cells unlocked in our Excel workbook.

The entire workbook will be unprotected when you start out. We can then edit specific cells you would like to have protected. When you protect the worksheet, no one else can edit that worksheet.

To protect your worksheet select **Protect Worksheet** under the **Review** tab. After selecting this option the **Protect Sheet** window will appear (shown in figure to the right). From there you can choose the options you with to protect.
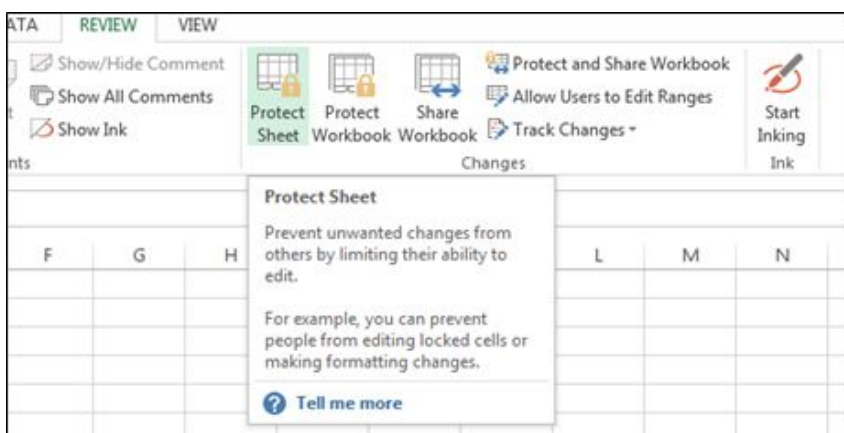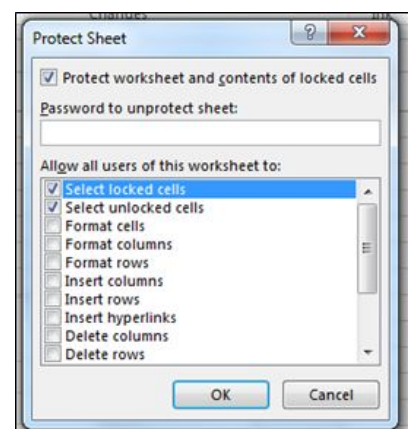

Figure 22: Microsoft Excel Protect Sheet

Figure 23: Microsoft Excel Protect Sheet