Heights Libraries
COMPUTER CLASSES

I hear, and I forget.
I see, and I remember.
I do, and I understand.
- Confucius

Excel 2019

Part 5: Charts and Graphs

Updated January 2019

Using charts and graphs in Excel is an excellent way to communicate the meaning of a group or series of numbers in a simple, visual way that makes more sense to most people than looking at raw data.

Charts and graphs can be used to see how much your gas bill has changed over a 12 month period, which salespeople are bringing in the most money, which flavor of popsicle is most popular, and other numerical comparisons. Any range of data input in Excel can be translated into a chart or graph, which can especially useful when giving presentations in work situations. The concept behind charts and graphs is that a picture is worth a thousand words; today we will learn how to draw those pictures with Excel.

Common Types of Charts

Excel offers a variety of charts and most have several subtypes associated with them. Be sure to choose the correct chart for the data in the spreadsheet.

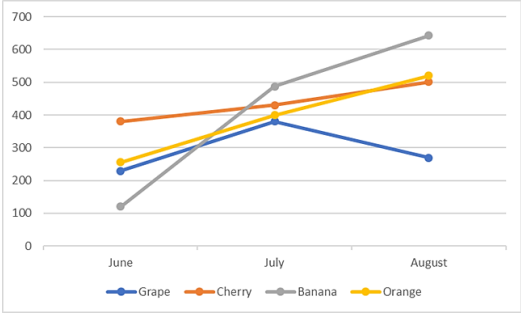
- Column
- Line
- Pie
- Area
- Bar

Column Chart

Column Charts compare different object levels over time using a vertical format. Data that is arranged in columns or rows on a worksheet can be plotted in a column chart. Column charts are useful for showing data changes over a period of time or for illustrating comparisons among items. Categories are typically organized along the horizontal axis and values along the vertical axis.

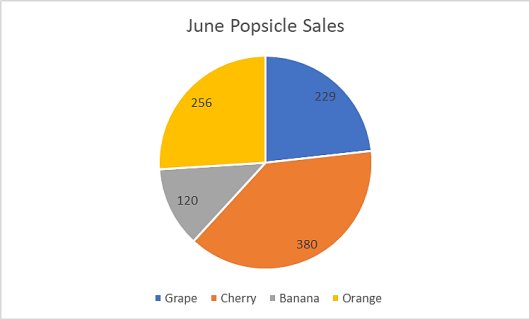
Line Chart

Line Charts compares a trend over even time intervals. Data that's arranged in columns or rows on a worksheet can be plotted in a line chart. Line charts are ideal for showing trends in data at equal intervals, like months, quarters, or fiscal years.



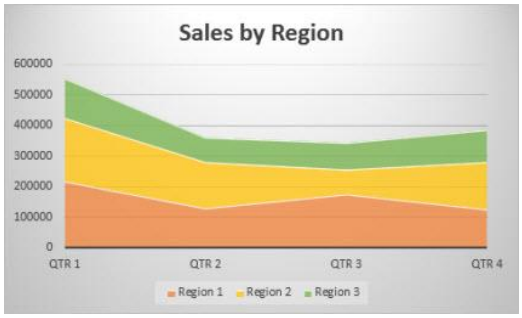
Pie Chart

Pie Charts compare sizes of pieces as part of a whole. Since pie charts represent a percentage of a whole, only one row or one column of a worksheet can be used.



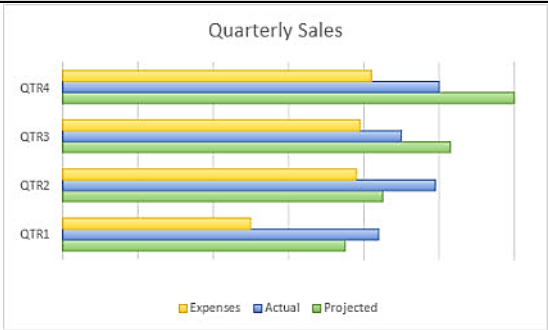
Area Chart

Area Charts show individual volume changes over time in relation to total volume or the size of total change over a period of time. For example, data that represents profit over time can be plotted in an area chart to emphasize the total profit.



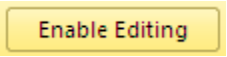
Bar Chart

Bar Charts compare different object levels over time using a horizontal format that arranges data in columns or rows on a worksheet. Bar charts illustrate comparisons among individual items.



Opening an Excel Document

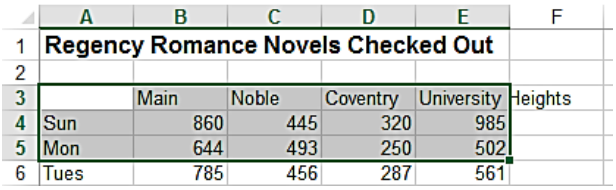
1. Open Excel from the Start menu
2. Open the file **excel_practice_file.xls** located in the **Documents** folder on the computer
3. If necessary, click the yellow **Enable Editing** button at the top of the Excel window



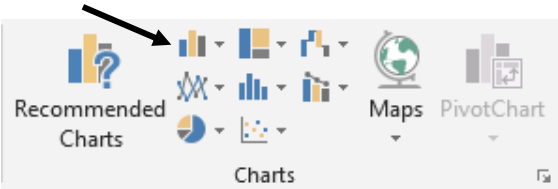
Navigate to the worksheet named **romances**, which lists the date for the number of romance books circulated by each branch of the Heights Library System for a one-week period. The days as well as the branches can be compared using different charts. The data on this sheet is used to create the charts in the following sections.

Column Charts

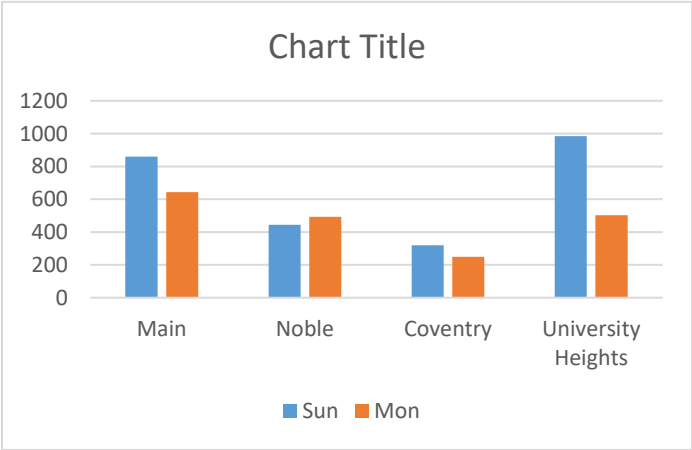
1. Select columns A, B, C, D and E in rows, 3, 4 and 5
2. Go to the **Insert** tab → Charts group → **Column** command

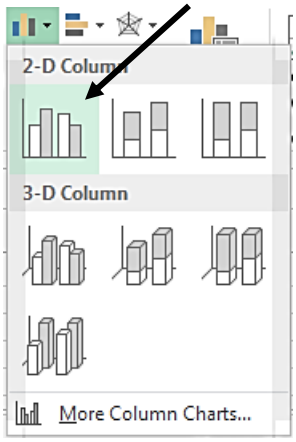


	A	B	C	D	E	F
1	Regency Romance Novels Checked Out					
2						
3		Main	Noble	Coventry	University	Heights
4	Sun	860	445	320	985	
5	Mon	644	493	250	502	
6	Tues	785	456	287	561	



3. Choose the first option under the heading **2-D Column**



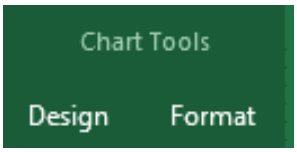


The chart appears on the same sheet on which the data is located. Often, it appears on top of some of the data. To move the chart:

1. Click the edge of the window
2. When the 4-headed arrow appears, hold down the left mouse button and drag the chart to the desired location.

Chart Tools Tabs

When a chart is inserted and selected, three contextual sub tabs appear on the right end of the Ribbon:



1. Chart Tools - Design
2. Chart Tools - Format

NOTE: The Chart Tools contextual tabs only appear when the chart is selected.

Chart Tools Design Sub Tab

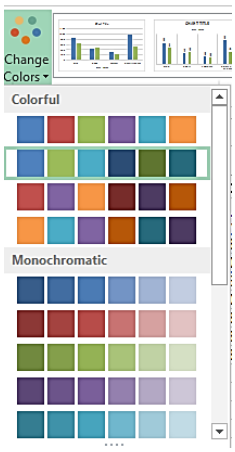
The **Design** sub tab provides tools for changing the look and feel of the chart. To avoid a lot of manual formatting, Microsoft Office Excel provides a variety of useful predefined quick layouts and styles.

The **Chart Styles** group can be used to quickly change the general appearance and color of a chart.

To change the chart style:

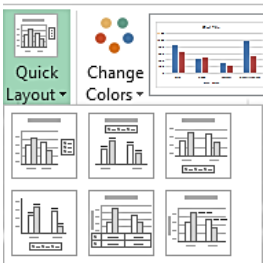
1. Click the chart to be formatted
2. Go to the **Chart Tools Design** tab → **Chart Styles** group → **Chart Styles more arrow** to open the Chart Styles gallery
3. Click the desired style, such as green style 6

To change the chart color:



1. Click the chart to be formatted
2. Go to the **Chart Tools Design** tab → **Chart Styles** group → **Change Colors** command to open the change colors drop down menu
3. Click the desired chart color, such as color 4

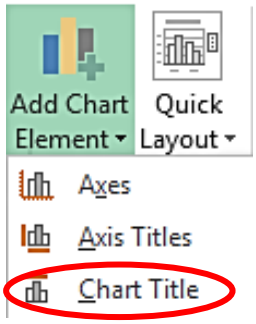
The **Chart Layouts** group provides options for changing the layout of the chart.

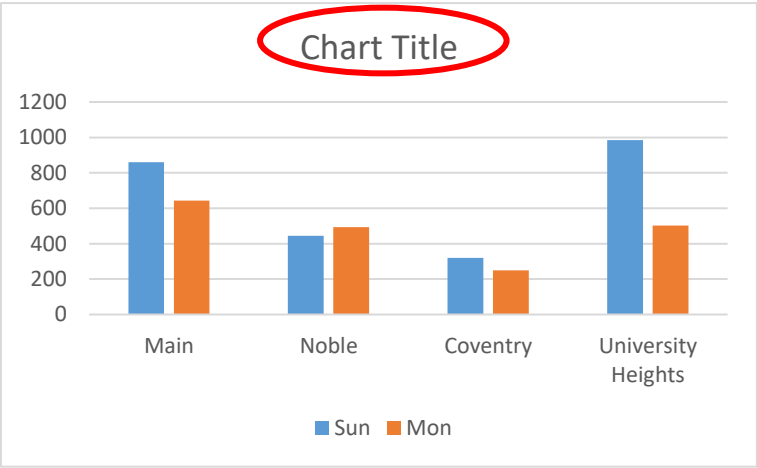


1. Go to the **Chart Tools Design** tab → **Chart Layouts** group → **Quick Layout** command to see all available layouts
2. Click the desired layout, such as layout 3

Adding a Title

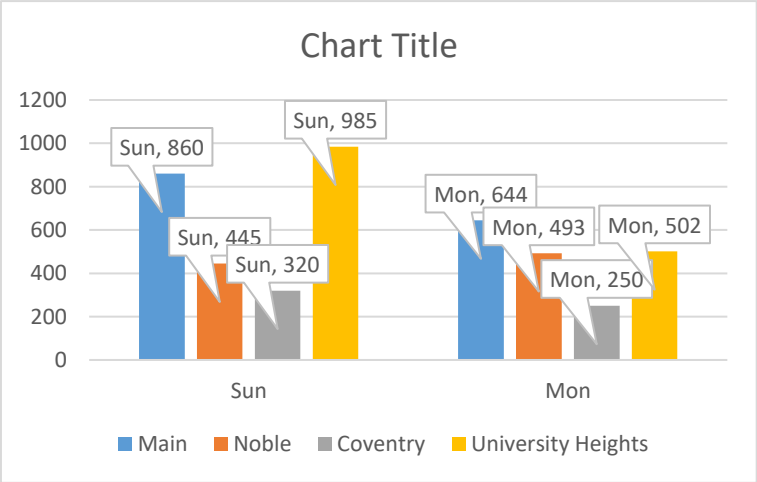
A **title** can be added to the chart through the **Design** sub tab → **Charts Layout** group → **Add Chart Element** command → **Chart Title**. Choose a location for the title, select the words **Chart Title**, and type in a new title.





Adding Data Labels

1. Click the chart to be formatted
2. Go to the **Design** sub tab → **Charts Layout** group → **Add Chart Element** command → **Data Labels**
3. Select **Data Callout** to place a tag with the data label on the chart or choose another location where the data labels should appear, such as Inside End



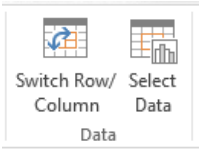
Adding an Axis Title

Axis titles can be added for either or both of the primary axes through the **Design** sub tab → **Charts Layout** group → **Add Chart Element** command → **Axis Titles**; several title options appear.

Adding Gridline and Axes

In the **Design** sub tab → **Charts Layout** group → **Add Chart Element** → **gridlines** command are options to edit the **axes** and **gridlines** (for example, adding more horizontal or vertical lines to show additional detail on the chart).

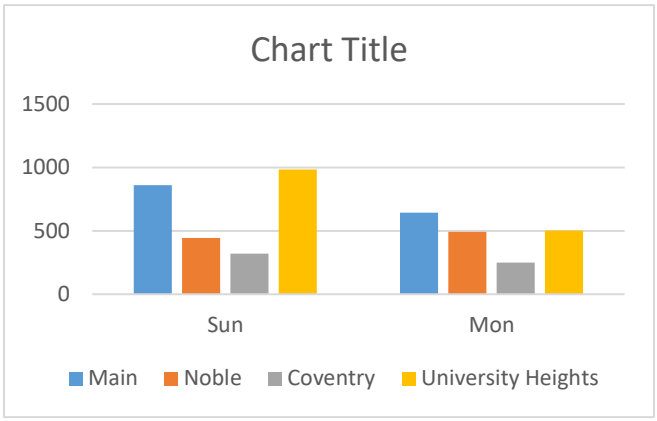
Switching the Row and Column



To the left of the Chart Layouts group are the **Data** and **Type** groups. Using the **Data** group, it is possible to switch rows and columns or choose different data. Switching rows and columns can be useful in comparing the data in a different way.

1. If necessary, click the chart to be formatted
2. Go to the **Design** sub tab → **Data** group → **Switch Row/column** command

   NOTE: Some charts do not display correctly with the columns and rows swapped.



Moving the Chart to another Worksheet

Excel 2013 offers two ways for a chart to be moved to worksheet:

1. If necessary, click the chart to be moved
2. Go to the **Design** sub tab → **Location** group → **Move Chart** command
   - To move the chart to a new blank sheet, choose the **New sheet** bullet and click OK
   - To move the chart to a worksheet that already exists, choose the **Object in** bullet, click the down arrow at the right end of the box and select the desired worksheet

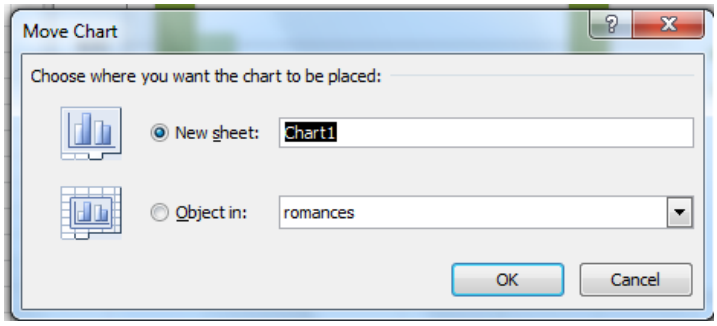
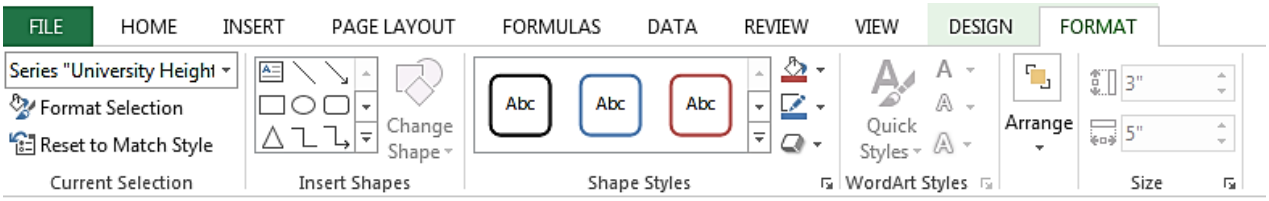


Chart Tools Format Sub Tab

The **Format** tab contains commands for changing the fill, outline and shape of the plot area, in addition to the color, style, outline, and fill of text within the chart. These same commands are located in the Formatting Task Pane.



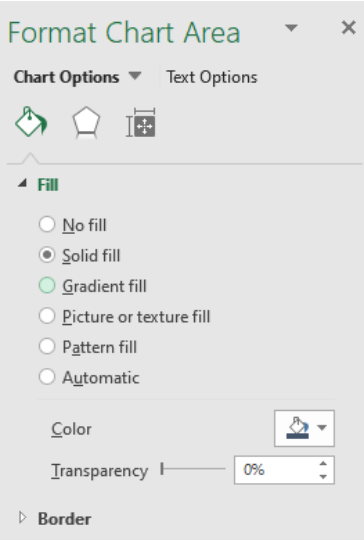
Formatting Task Pane

The Formatting Task Pane, which when open, appears on the right side of the excel screen, is a new feature in Excel 2019. It contains commands for changing the fill, outline, effect, shape and size of chart elements. In addition to the color, style, outline, and fill of the text within the chart. In previous versions of Excel formatting changes were made in the format dialog box.

There are two ways to open the **Formatting** Task Pane:

- Double click on the chart element to edit
- **Format** sub tab → **Current Selection** group → **Format Selection**

The **Chart Options** drop down menu is helpful in selecting specific parts of the chart to edit. It keeps track of what is currently selected and offers a myriad of formatting options such as fills, border and line color, border and line style, shadowing, and 3-D formatting.



Formatting a Selection

1. Click the chart and open the **Formatting Task Pane**
2. Click the down arrow in the **Chart Options** box
3. Select the desired section, such as **Plot Area**
4. In the formatting task pane click on **Fill**
5. Choose the **Gradient fill** bullet
6. Click the **Preset gradients** arrow and choose a gradient color

In the Formatting Task Pane, **Chart Options** contains commands to change the fill, outline, effect, shape and size of individual chart elements.

Text Options contains commands to alter the color, style, outline, and fill of the text within the chart.

Click the **X** in the upper right corner to close the task pane

NOTE: Not all formatting options are available for all parts of a chart—the task pane changes to reflect options that are available for the current selection.

Line Charts

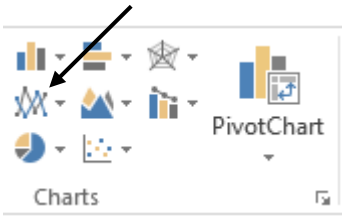
Let's compare circulation at Coventry and Main using a **line chart**.

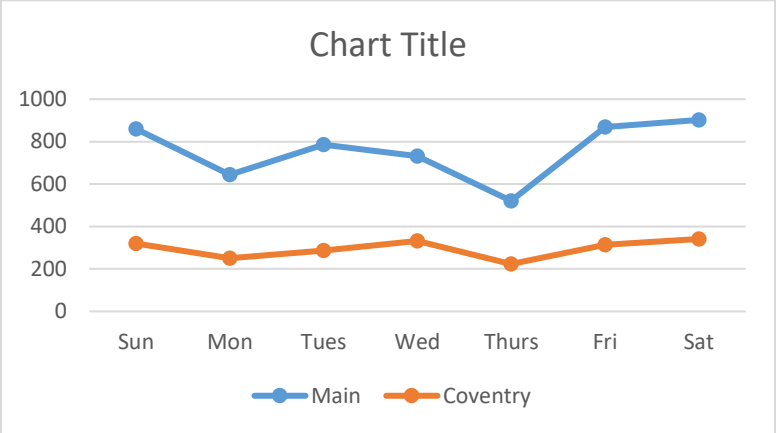
1. If necessary, go to the **romances** worksheet
2. Select **column A** and **B rows 3** through **10**
3. To select a noncontiguous column, hold down the **Ctrl** key on the keyboard and select **column D**, **rows 3** through **10**
4. Go to the **Insert** tab → **Charts** group → **Line** command

	A	B	C	D	E	F
1	**Regency Romance Novels Checked Out**					
2						
3		Main	Noble	Coventry	University Heights	
4	Sun	860	445	320	985	
5	Mon	644	493	250	502	
6	Tues	785	456	287	561	
7	Wed	732	503	332	604	
8	Thurs	521	498	223	782	
9	Fri	869	528	314	586	
10	Sat	902	480	341	488	
11	**Total**					
12	**Average**					

5. Choose the first option in the second row of the drop-down menu, **Line with Markers**

A line chart with markers appears.

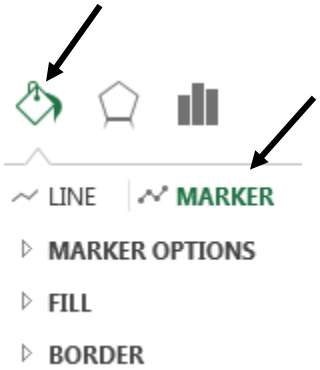




Changing Chart Colors

Charts can be customized by changing the colors of one or more elements.

NOTE: Changing a color on the chart is automatically reflected in the chart key.



1. Double-click the **Main** line on the chart; the formatting task pane appears
2. Go to **Fill &Line** (paint bucket) → **Marker** → **Marker Options**
3. Choose the **Built-in** bullet
4. Click the **Type** arrow and choose a new bullet type
5. Click the **Fill** → **Color** arrow and change the bullet to green
6. Click the **X** in the upper right corner to close the task pane

NOTE: In a line chart, fill colors must be chosen for the marker and the line separately.

Pie Charts

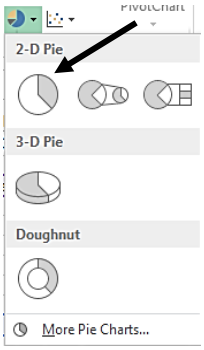
A **pie chart** is used to compare the input of various entities to a total. For example: comparing the percentages of branch contributions to the total circulation on a particular day.

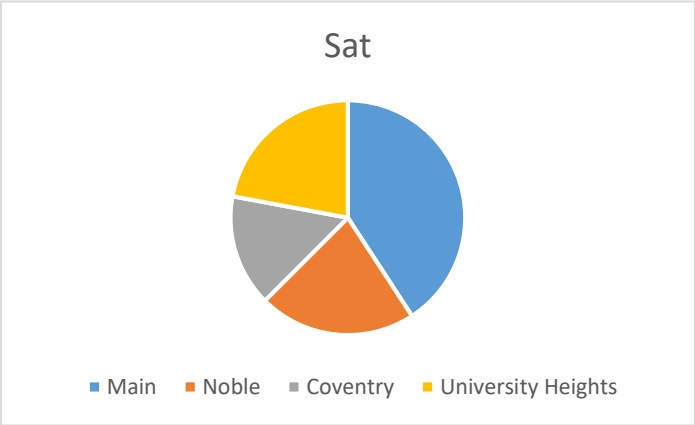
1. If necessary, go to the **romances** worksheet
2. Select the **Saturday** data including the labels for row 10 (columns A through E)
3. Hold down the **Ctrl** key and select the labels in **row 3** (**columns A through E**)

	A	B	C	D	E	F
1	**Regency Romance Novels Checked Out**					
2						
3		Main	Noble	Coventry	University	Heights
4	Sun	860	445	320	985	
5	Mon	644	493	250	502	
6	Tues	785	456	287	561	
7	Wed	732	503	332	604	
8	Thurs	521	498	223	782	
9	Fri	869	528	314	586	
10	Sat	902	480	341	488	
11	**Total**					
12	**Average**					

4. Go to the **Insert** tab → **Charts** group → **Pie** command

5. Choose the first option under **2-D Pie**; a pie chart appears

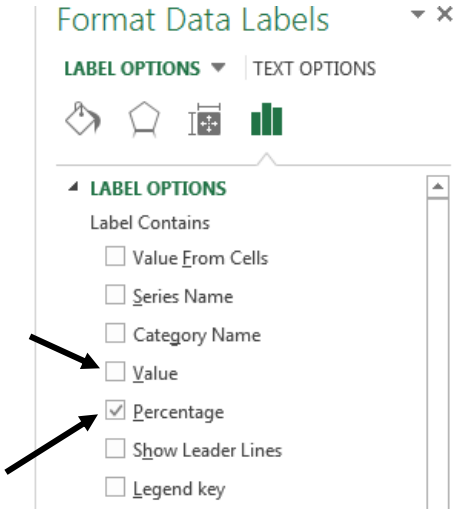




Adding Percentages to a Pie Chart

Pie charts can be labeled with percentages so that it's clear how much of the pie each part occupies.

1. If necessary, click on the chart to select it
2. Go to the **Design** sub tab → **Charts Layout** group → **Add Chart Element** command → **Data Labels**
3. Choose **More Data Label Options** from the drop-down list; the Formatting Task Pane appears on the right side of the screen
4. In the **Formatting Task Pane**, click the checkbox next to **Percentage**
5. Click to remove the checkmarks from the boxes next to any other options (usually **Value** is the default)
7. Click the **X** in the upper right corner to close the task pane



The One-Click Chart

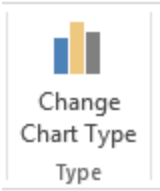
To create a chart with just one click, select the data to be included in the chart and hit the **F11** key on the keyboard; the chart should appear as a new sheet in the workbook. Try it using the **romances** sheet:

1. Select **rows 3 through 10, columns A through E**
2. Press the **F11** key on the keyboard; the chart is created on a new page labeled **Chart1**

   NOTE: If a Chart1 sheet already exists, the new chart is named by the next available number.

Change Chart Type

Excel makes it easy to change the chart type



1. If necessary, click on the chart to select it
2. Go to the **Design** sub tab → **Type** group → **Change Chart Type** command
3. The **Change Chart Type** dialog box appears; select a new chart type
4. Click **Close**

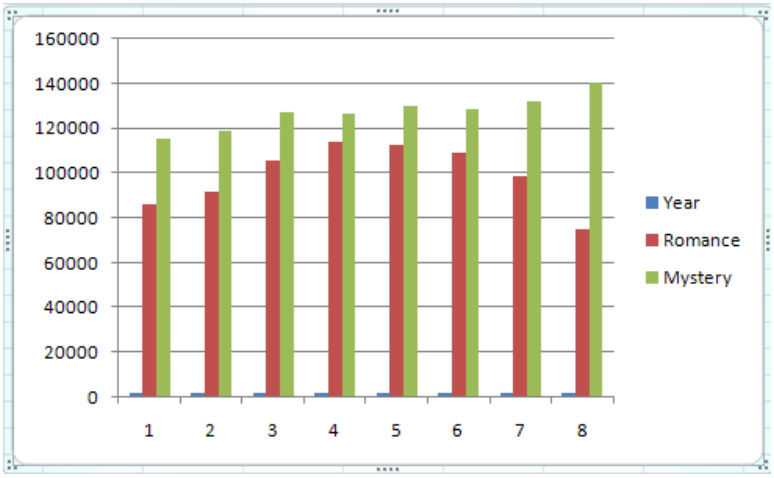
Tweaking a Chart

Sometimes a chart needs to be tweaked to get the desired look. Following is a common problem that arises:

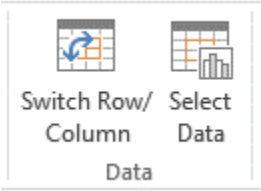
1. Go to the **genre circ** worksheet
2. Select cells **A2** to **C10**
3. Go to the **Insert** tab → **Column Chart**
4. Choose the first chart

	A	B	C
1	Genre Circulation		
2	Year	Romance	Mystery
3	1995	86251	115247
4	1996	91884	118984
5	1997	105846	126985
6	1998	114021	126445
7	1999	112540	130115
8	2000	109005	128800
9	2001	98612	131951
10	2002	74991	140654

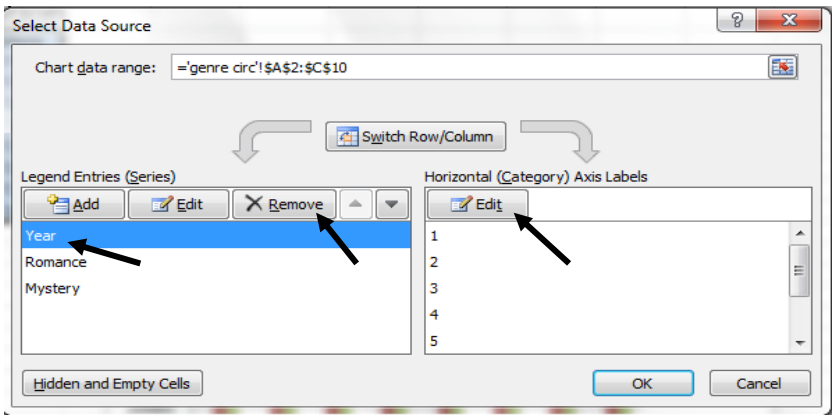
The chart is treating the column containing the years as part of the data to be plotted rather than as labels for the horizontal axis.

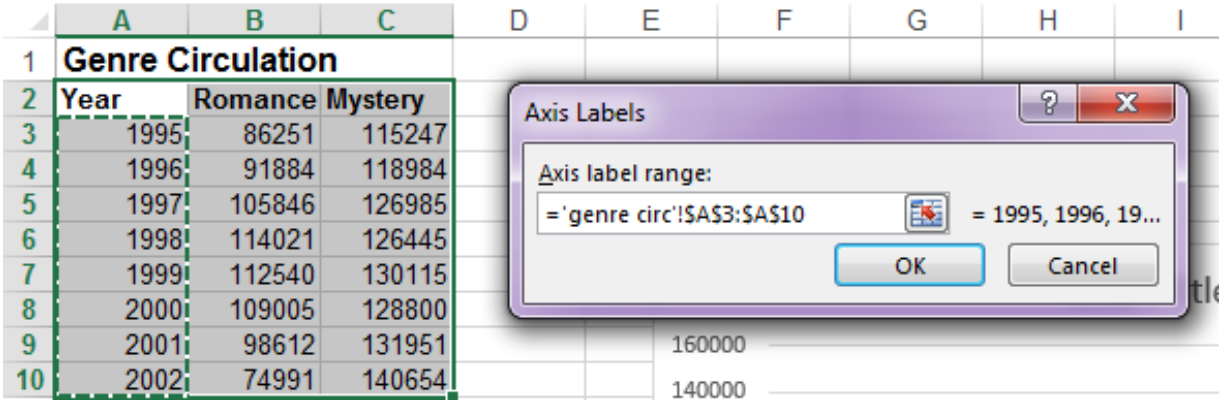


To remedy this issue:

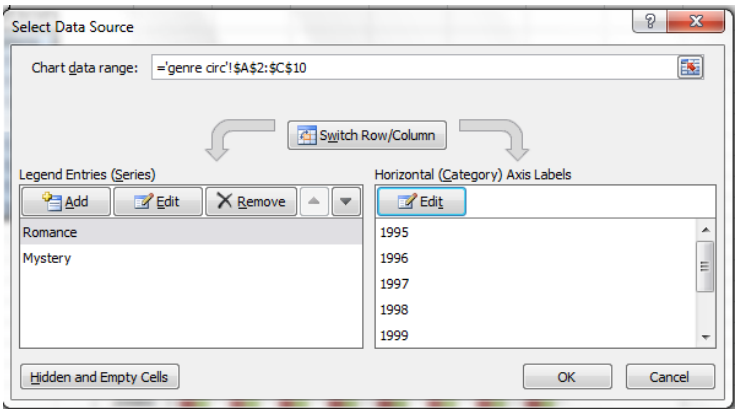


1. Go to the **Chart Tools Design** sub tab → **Data** group → **Select Data** command
2. In the **Select Data Source** dialog box, click on the series name **Year** in the box on the left
3. Click the **Remove** button in the **Legend Entries** section
4. In the **Horizontal (Category) Axis Labels** box on the right, click the **Edit** button
5. When the **Axis Labels dialog** box appears, select cells **A3** to **A10** on the spreadsheet
6. Click **OK** in the **Axis Labels** dialog box

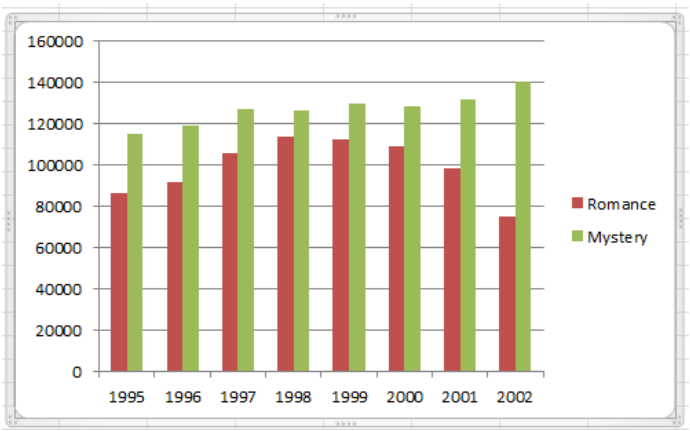




7. The **Select Data Source** dialog box should now look like this:



8. Click **OK** to see the corrected chart; the Year column is gone and each year is now listed as a label along the horizontal axis



Practice Exercises

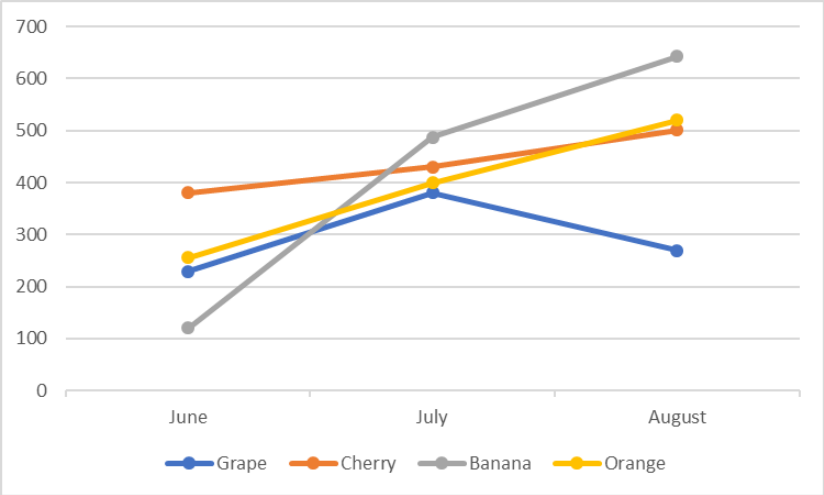
Additional practice! Try making a chart on your own.

	June	July	August
Grape	229	380	269
Cherry	380	430	501
Banana	120	487	643
Orange	256	400	520

1. Add a new sheet to the workbook
2. The data to the right tracks how many popsicles were sold over the summer months.

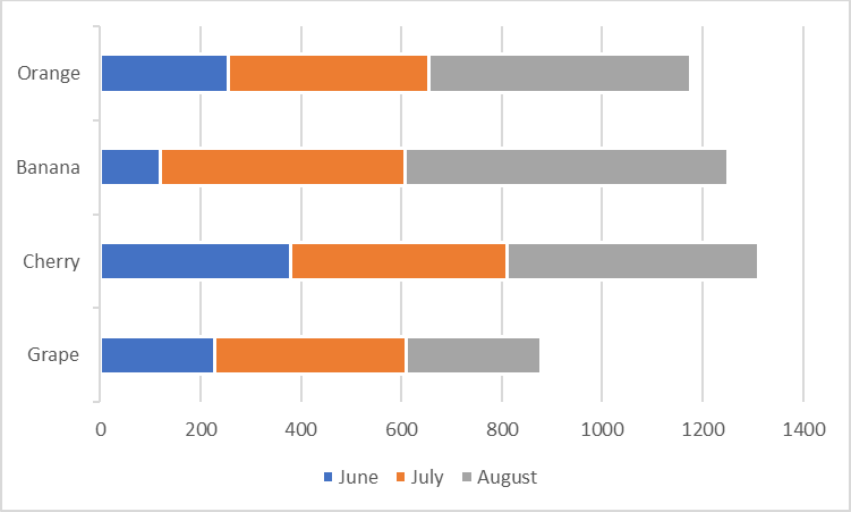
   Type the data from the table to the right on your spreadsheet.
3. Create a chart that shows the changes in popularity of popsicle flavors over the 3-month period.

   NOTE: Line charts are useful for showing change over time.

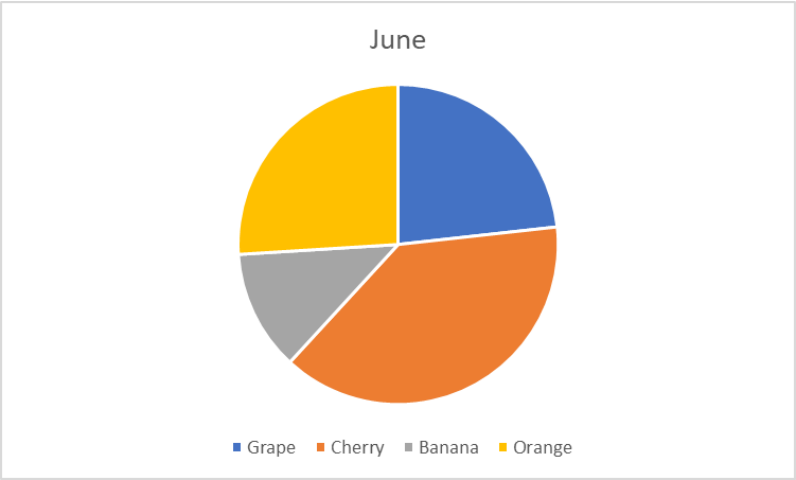


4. Create a chart that shows which flavor sold the most overall in the 3-month period.

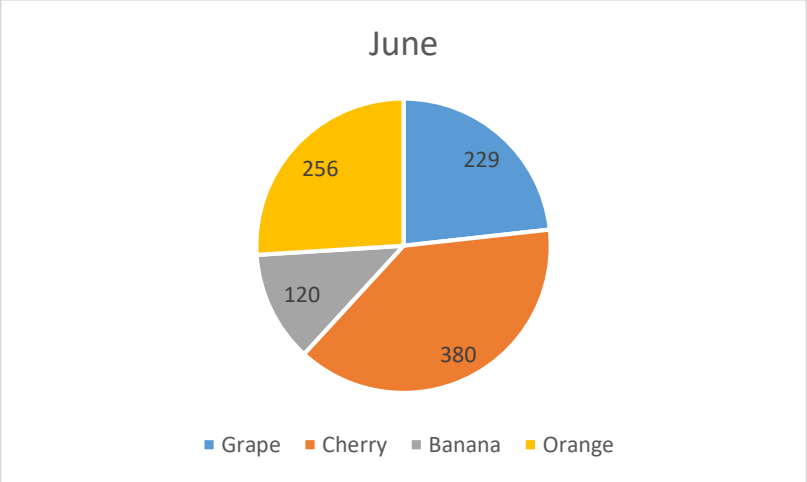
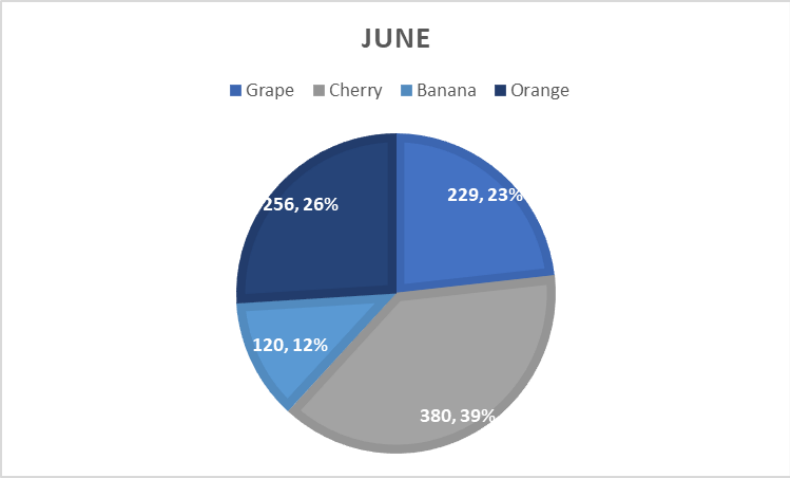
   NOTE: Stacked bar charts are useful for showing the relationship of individual items to the whole.



5. Create a chart that shows the percentages of different flavors sold during the month of June. **NOTE**: Pie charts are useful for comparing percentages of a whole.



6. Add data labels to one or more your charts.



7. Change the style and/or colors on one or more of the charts.