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.

![Line Chart Example](image)

**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.

![Pie Chart Example](image)

**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.

![Area Chart Example](image)

**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.

![Bar Chart Example](image)
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
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

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regency Romance Novels Checked Out</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Main</td>
<td>Noble</td>
<td>Coventry</td>
<td>University Heights</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sun</td>
<td>860</td>
<td>445</td>
<td>320</td>
<td>985</td>
</tr>
<tr>
<td>5</td>
<td>Mon</td>
<td>644</td>
<td>493</td>
<td>250</td>
<td>502</td>
</tr>
<tr>
<td>6</td>
<td>Tues</td>
<td>785</td>
<td>456</td>
<td>287</td>
<td>561</td>
</tr>
<tr>
<td>7</td>
<td>Wed</td>
<td>732</td>
<td>503</td>
<td>332</td>
<td>604</td>
</tr>
<tr>
<td>8</td>
<td>Thurs</td>
<td>521</td>
<td>458</td>
<td>223</td>
<td>782</td>
</tr>
<tr>
<td>9</td>
<td>Fri</td>
<td>869</td>
<td>528</td>
<td>314</td>
<td>586</td>
</tr>
<tr>
<td>10</td>
<td>Sat</td>
<td>902</td>
<td>480</td>
<td>341</td>
<td>488</td>
</tr>
<tr>
<td>11</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Choose the first option in the second row of the drop-down menu, **Line with Markers**

A line chart with markers appears.

![Line Chart](chart.png)

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

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

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**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)

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

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**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

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.
Additional practice! Try making a chart on your own.

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.

   ![Line chart showing changes in popsicle sales over 3 months]

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.

   ![Stacked bar chart showing total sales by flavor over 3 months]
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.

![Pie chart showing percentages of different flavors sold in June.]

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

![Pie chart with data labels showing percentages of different flavors sold in June.]

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

![Pie chart with changed style and colors showing percentages of different flavors sold in June.]