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**Microsoft Excel 3**
Advanced-Level Features of Excel 2013

## Pivot Tables

See the *Pivot Tables* tab in the *Excel 3 Practice.xls* spreadsheet located on the Workshop documents folder

Pivot tables in Excel are a versatile reporting tool that makes it easy to extract information from large tables of data without the use of formulas. Pivot tables are extremely user-friendly in that by moving (or pivoting) fields of data from one location to another using *drag-and-drop* we can look at the same data in a number of different ways.

1. Add the data you wish to create a pivot table for. Sample data (in cells A2 to D12) has already been entered for you in the *Pivot Tables* tab in the *Excel 3 Practice.xls* spreadsheet. Note that your data has multiple columns so you can view the data multiple ways. At least three columns of data are needed to create a pivot table.  Do not leave blank rows or columns when entering the data. Also, do not leave a blank row between the column headings and the first row of data.

|   | A | B | C | D |
|---|---|---|---|---|
| 1 | Cookie Sales by Region | | | |
| 2 | Sales Rep | Region | # Orders | Total Sales |
| 3 | Bill | West | 217 | $41,107 |
| 4 | Frank | West | 268 | $72,707 |
| 5 | Harry | North | 224 | $41,676 |
| 6 | Janet | North | 286 | $87,858 |
| 7 | Joe | South | 226 | $45,606 |
| 8 | Martha | East | 228 | $49,017 |
| 9 | Mary | West | 234 | $57,967 |
| 10 | Ralph | East | 267 | $70,702 |
| 11 | Sam | East | 279 | $77,738 |
| 12 | Tom | South | 261 | $69,496 |

2. Left-click-and-drag the sample data from cells A2 to D12 to highlight just the column headers and the data. Do not highlight the cell A1 containing 'Cookie Sales by Region'.
3. Click on the Insert tab of the Ribbon at the top of Excel.
4. Click on the *down arrow* at the bottom of the Pivot Table button to open the drop-down list.
5. Click on *Pivot Table* in the list to open the *Create Pivot Table* dialog box.
6. Click on *Existing Worksheet* for the location of the pivot table.
7. Click on the *Location* line in the dialog box.

8.  Click on cell **A16** in the worksheet to enter that cell reference into the location line.
9.  Click the **OK** button.
10. A **blank pivot table object** (like the one below) should appear on the worksheet with the upper-left corner of the pivot table in cell A16.
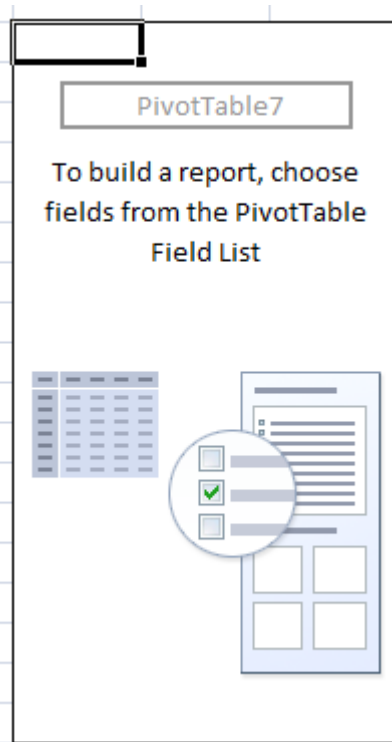


11. The **Pivot Table Field List** should open on the right-hand side of the Excel window. At the top of the **Pivot Table Field List** are the field names (column headers) from our data table. The data areas at the bottom of the panel are linked to the pivot table.
12. Now you will configure (add data to) the pivot table by dragging and dropping the field names to the data areas within the **Pivot Table Field List** as follows:
    - Drag the **Total Sales** field to the **Report Filter** area
    - Drag the **Region** field to the **Column Labels** area
    - Drag the **Sales Rep** field to the **Row Labels** area
    - Drag the **# Orders** field to the **Values** area
13. Click on cell A17 and in the Formula Bar, rename it from **Row Labels** to **Sales Rep**.
14. Click on cell B16 and in the Formula Bar, rename it from **Column Labels** to **Region**.
15. After completing the above step, your pivot table should look like the one located in cells H14 to M28 (and shown below) and the Pivot Table Field List should look like the picture below.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 14 | Total Sales | (All) | | | | |
| 15 | | | | | | |
| 16 | Sum of # Orders | Region | | | | |
| 17 | Sales Rep | East | North | South | West | Grand Total |
| 18 | Bill | | | | 217 | 217 |
| 19 | Frank | | | | 268 | 268 |
| 20 | Harry | | 224 | | | 224 |
| 21 | Janet | | 286 | | | 286 |
| 22 | Joe | | | 226 | | 226 |
| 23 | Martha | 228 | | | | 228 |
| 24 | Mary | | | | 234 | 234 |
| 25 | Ralph | 267 | | | | 267 |
| 26 | Sam | 279 | | | | 279 |
| 27 | Tom | | | 261 | | 261 |
| 28 | Grand Total | 774 | 510 | 487 | 719 | 2490 |

**PivotTable Field List**

Choose fields to add to report:

- ☑ **SalesRep**
- ☑ **Region**
- ☑ **# Orders**
- ☑ **Total Sales**

Drag fields between areas below:

| ▼ Report Filter | ▦ Column Labels |
|---|---|
| Total Sales ▼ | Region ▼ |

| ▦ Row Labels | Σ Values |
|---|---|
| SalesRep ▼ | Sum of # Ord... ▼ |

☐ Defer Layout Update          Update

16. Try using the drop-down filter buttons for **Sales Rep** and **Region** to hide selected data rows and columns.

17. Try creating a new pivot table like the one located in cells H3 to S11 (shown below) by configuring the pivot table like the picture below. Note that you can either create a new pivot table or simply just drag and drop the field names in your old pivot table to the different data areas shown below.

| Sum of Total Sales | SalesReps | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Regions** | **Bill** | **Frank** | **Harry** | **Janet** | **Joe** | **Martha** | **Mary** | **Ralph** | **Sam** | **Tom** | **Grand Total** |
| East | | | | | | 49017 | | 70702 | 77738 | | 197457 |
| North | | | 41676 | 87858 | | | | | | | 129534 |
| South | | | | | 45606 | | | | | 69496 | 115102 |
| West | 41107 | 72707 | | | | | 57967 | | | | 171781 |
| **Grand Total** | 41107 | 72707 | 41676 | 87858 | 45606 | 49017 | 57967 | 70702 | 77738 | 69496 | 613874 |

# Orders: (All)

**PivotTable Field List**

Choose fields to add to report:
- ☑ SalesRep
- ☑ Region
- ☑ # Orders
- ☑ Total Sales

Drag fields between areas below:

**Report Filter:** # Orders

**Column Labels:** SalesRep

**Row Labels:** Region

**Σ Values:** Sum of Total ...

☐ Defer Layout Update    Update

**Drag the field names to different data areas to obtain different viewing results from the Pivot Table**

## Removing Duplicate Data Records

Spreadsheet programs such as Excel are often used as databases for things like parts inventories, sales records, and mailing lists. Databases are normally organized into rows of data called records. In a record, the data in each cell or field in the row is related - such as a company's name, address and phone number. A common problem that occurs as a database grows in size is that of duplicate records.

This duplication can occur if:
- entire records are entered into the database more than once resulting in two or more identical records
- multiple records have one or more fields - such as a name field or address - containing the same data.

Either way, duplicate records can cause a whole host of problems so it's a good idea to scan for and remove duplicate records on a regular basis. To help you accomplish this task Excel has a built in data tool called, not surprisingly, *Remove Duplicates*.

1. Add the data you wish to use, along with duplicate records. Sample data (in cells A1 to C15) has already been entered for you in the *Duplicate Data* tab in the *Excel 3 Practice.xls* spreadsheet (image of data is shown below):

| | A | B | C |
|---|---|---|---|
| 1 | Student ID | Student Name | Classification |
| 2 | 11111111 | Candi Barr | Junior |
| 3 | 22222222 | Adam Baum | Senior |
| 4 | 33333333 | Joe King | Freshman |
| 5 | 44444444 | Bess Sellars | Sophmore |
| 6 | 11111111 | Candi Barr | Junior |
| 7 | 44444444 | Bess Sellars | Sophmore |
| 8 | 55555555 | Carrie Oakie | Senior |
| 9 | 66666666 | Dan Singh | Freshman |
| 10 | 77777777 | Al O'Moaney | Senior |
| 11 | 88888888 | Anita Hug | Sophmore |
| 12 | 99999999 | Ben Thair | Junior |
| 13 | 22222222 | Adam Baum | Senior |
| 14 | 88888888 | Anita Hug | Sophmore |
| 15 | 99999999 | Ben Thair | Junior |

2. Click on any cell containing data in the sample database in cells A1 to C15.
3. Click the Data tab on the Ribbon.
4. Click on the Remove Duplicates icon to highlight all data in the database and to open the Remove Duplicates dialog box.

5.  Leave a checkmark **only** in the *Student ID* column. Remove the checkmarks from the *Student Name* and *Classification* columns. Leave the checkmark in the *My data has headers* checkbox. Click on the OK button.
6.  After removing the duplicate data, your data should look like the image below. Note that removing duplicate data does not automatically sort the remaining data records for you.

| Student ID | Student Name | Classification |
|---|---|---|
| 11111111 | Candi Barr | Junior |
| 22222222 | Adam Baum | Senior |
| 33333333 | Joe King | Freshman |
| 44444444 | Bess Sellars | Sophmore |
| 55555555 | Carrie Oakie | Senior |
| 66666666 | Dan Singh | Freshman |
| 77777777 | Al O'Moaney | Senior |
| 88888888 | Anita Hug | Sophmore |
| 99999999 | Ben Thair | Junior |

# Sparklines

What is a sparkline?

A sparkline is a small chart that is aligned with rows of some tabular data and usually shows trend information. Sparklines (often called as micro-charts) add rich visualization capability to tabular data without taking too much space. They have also been referred to as intense, simple, word-sized graphics

Here is an example of sparklines in a project team status report with sparklines displayed in cells B2 through B7.

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Team Member | Total Tasks Completed | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 |
| 2 | Lisa Carr | | 25 | 21 | 27 | 27 | 49 | 42 | 28 | 21 | 45 |
| 3 | Robin Banks | | 27 | 41 | 24 | 35 | 46 | 49 | 44 | 41 | 49 |
| 4 | Olive Yew | | 28 | 28 | 31 | 35 | 34 | 24 | 43 | 29 | 21 |
| 5 | Rose Busch | | 47 | 20 | 47 | 45 | 50 | 39 | 42 | 39 | 27 |
| 6 | Mack Aroni | | 45 | 44 | 50 | 46 | 35 | 20 | 27 | 39 | 46 |
| 7 | Rick Shaw | | 24 | 31 | 29 | 50 | 30 | 37 | 24 | 29 | 21 |

1.  Click on the *Insert* tab.
2.  Select the data from which you want to make a sparkline. Left-click and drag on cells **C2** through **K4**
3.  In the *Sparklines* group, click on the *Line* button

4. Specify a target cell(s) where you want the sparkline(s) to be placed. In the **Create Sparklines** dialog box with the cursor blinking in the Location Range textbox, left-click and drag on cells **B2** through **B4** and then click the **OK** button

5. Optional: Format the sparkline(s), if you so desire. With the new sparkline(s) still highlighted, click the down-arrow next to the **Sparkline Color** (located in the Style Group) and choose a color. Click the down-arrow next to the **Marker Color** (located in the Style Group) and choose colors for **High Point** (choose green), **Low Point** (choose red) and **Markers** (choose black).

6. Click on the **Insert** tab then left-click and drag on cells **C5** through **K7**

7. In the **Sparklines** group, click on the **Column** button then left-click and drag on cells **B5** through **B7** then click on the **OK** button

8. Format the **Sparkline Color** and the **Marker Color** similar to the colors used in Step 5 above

9. At a later date, if you wish to change colors or line types for the sparkline simply click on the sparkline and Excel will change to the **Design** tab to allow you to make your new choices.

## Excel Drop-Down List

Excel's data validation options include creating a drop down list that limits the data that can be entered into a specific cell to a pre-set list of entries.

The benefits for using a drop down list for data validation include:

- making data entry easier
- preventing data entry errors
- restricting the number of locations for entering data

When a drop-down list is added to a cell, an arrow is displayed next to it. Clicking on the arrow will open the list and allow you to select one of the list items to enter into the cell. See the image below:
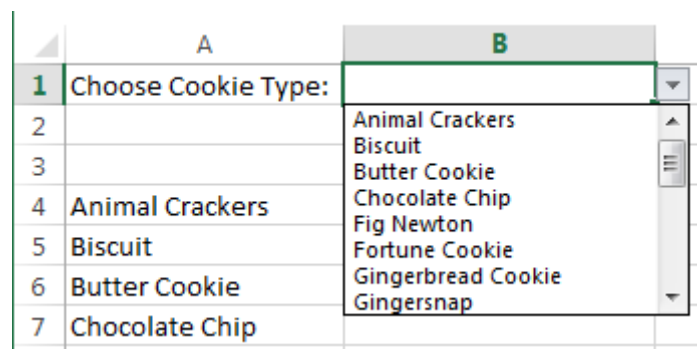
The items that are added to the list can be located on the same worksheet as the list, on a different worksheet in the same Excel workbook, or can be entered directly into the list. In this tutorial we will create a drop down list using a list of entries located on the same worksheet as the drop-down list itself.

1.  The first step to creating a drop-down list in Excel is to enter the list data. In order to save time, the list data has been pre-entered for you in cells A3 through A25 in the **Drop-Down List** tab in the **Excel 3 Practice.xls** spreadsheet (image of data is shown below). Note that cell A3 is empty and will show up as a blank line in the first position in the data list. Note that some people prefer to place the list data in a separate spreadsheet or move it out of sight within the same spreadsheet where the drop-down listbox is placed. For ease of use, we have placed the list data in close proximity to the drop-down listbox.
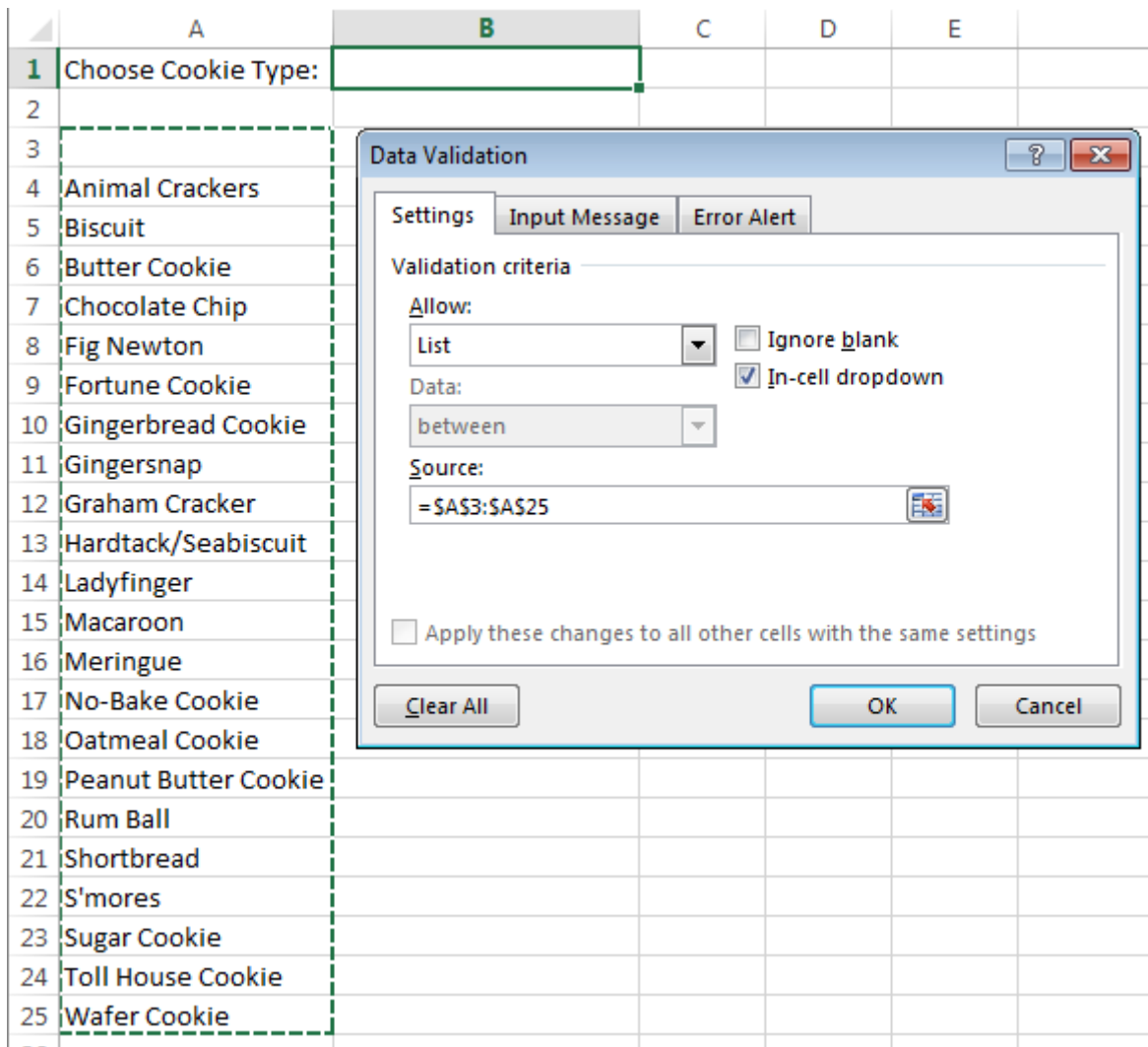


2.  Click on cell B1 to make it the active cell - this is where the drop down listbox will be located.

3. Click on the *Data* tab in the ribbon menu and select the *Data Validation* button
4. In the Data Validation dialog box that popped up, choose *List* for the *Allow:* entry, un-check the box by *Ignore blank* and then click in the *Source* box (match the settings from the image above)
5. Left-click-and-drag on cells A3 through A25 to select the range for the Source box. Note that if you prefer to enter data directly into the Source line of the dialog box, the list items must be separated by a comma such as: *Animal Crackers, Biscuit, Butter Cookie, Chocolate Chip*
6. Click on the OK button to close the dialog box
7. Now, when you left-click on the drop-down arrow for the listbox, you should see something like the image below:
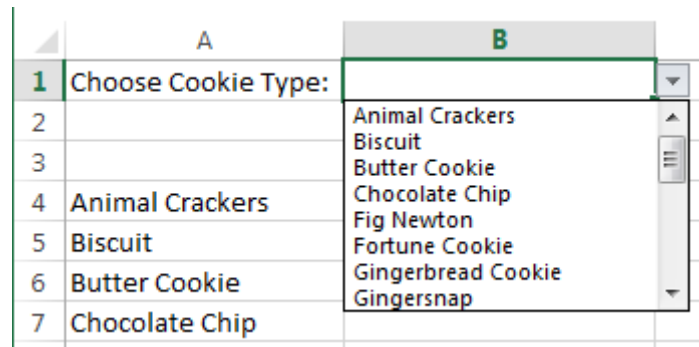


## Creating plots of multiple data series on one chart/graph
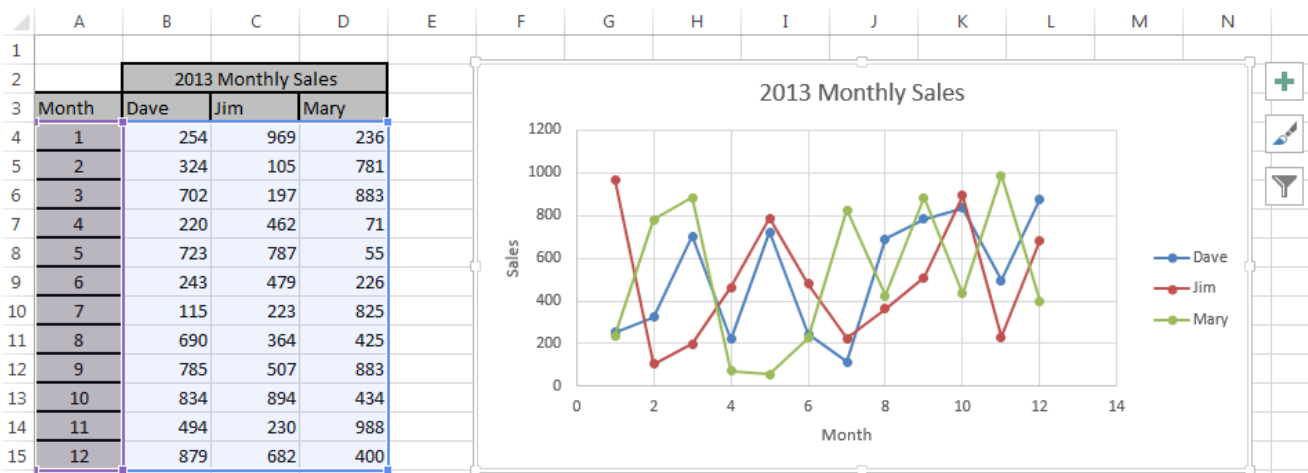


Let's say that you have monthly sales data for the entire year of 2013 for three salespeople and you would like to show all three sales data series in different colors on the same chart/graph. Some random data has been pre-entered for you in cells A2 through D15 in the *Multiple Series Chart* tab in the *Excel 3 Practice.xls*
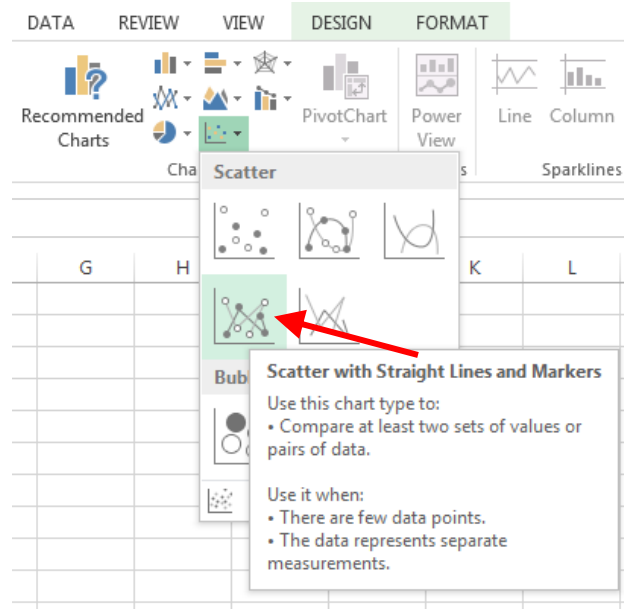
spreadsheet (image of data is shown above). Note that when you save the spreadsheet, new random data will automatically be generated for you.

1. Click on the **Insert** tab in the ribbon menu and go to the **Charts** group and select **the Insert Scatter (X, Y) or Bubble Chart** button and choose **Scatter with Straight Lines and Markers**



2. Right-click on the blank chart and choose **Select Data…** then click on the **Add** button in the **Select Data Source** dialog box.
3. Type in **Dave** for the **Series name:** field then click in the **Series X values:** field and left-click and drag on cells **A4** through **A15**
4. Click in the **Series Y values:** field then highlight any data in that field and press the delete key. Left-click and drag on cells **B4** through **B15** and click on the **OK** button
5. Click on the **Add** button again in the **Select Data Source** dialog box and repeat Steps 3 and 4 using **Jim** for the Series name and cells **A4** through **A15** for the **Series X** values and cells **C4** through **C15** for the **Series Y** values and click on the **OK** button.
6. Repeat Step 5 using **Mary** for the Series name and cells **A4** through **A15** for the **Series X** values and cells **D4** through **D15** for the **Series Y** values and click on the **OK** button. Click on the OK button in the **Select Data Source** dialog box.
7. Add a Chart Title for the horizontal axis by clicking on **Add Chart Element** in the upper-left corner of the Design tab. Select **Axis Title** then **Primary Horizontal** and then type in **Month** and press the **Enter** key
8. Add a Chart Title for the vertical axis by clicking on **Add Chart Element** in the upper-left corner of the Design tab. Select **Axis Title** then **Primary Vertical** and then type in **Sales** and press the **Enter** key
9. Click on the chart to select it then click on the **+ sign** button to the right of the chart.

10. In the Chart Elements dialog box, put checkmarks in the Chart Title and Legend checkboxes and then click in an empty cell.
11. Double-click on Chart Title textbox and replace *Title* with *2013 Monthly Sales*

## Sample Monthly Budget and Spending Plan

See the *Dec 2013 Spending Plan* tab and the *Dec 2013 Budget* in the *Excel 3 Practice.xls* spreadsheet.

During class we will add some more sample data to these spreadsheet to demonstrate the formula-based conditional formatting and some what-if scenarios.

## Northstar Review

See the **Northstar Review** tab and go through the steps numbered 1 through 13. These questions are representative of questions that will be on the northstar.