

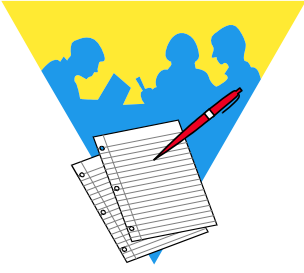


# **Excel 2016 PivotTable Features**

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## Lesson Notes



# Excel 2016 PivotTable Features

Rel 1.0 10/26/2017

Course Number: 0200-500-16-W  
Course Release Number: 1.0  
Software Release Number: 2016

October 26, 2017

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Published by:  
RoundTown Publishing  
5131 Post Road, Suite 102  
Dublin, Ohio 43017

for

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5131 Post Road, Suite 102  
Dublin, Ohio 43017  
(614) 798-9505

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## Using this Manual

Welcome to the *Excel 2013 Pivot Tables* 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 Workshops* website, look at the bottom of any page to find the link *Download*. Clicking this link opens the *Download* page where you can choose either ***Data Files*** or ***Handouts***.

1. ***Data Files*** opens 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.

The 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.





## 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***

- ◆ Group names are in bold: Example: **Font**

- ◆ Dialog box names are in italic: Example: *Save As*

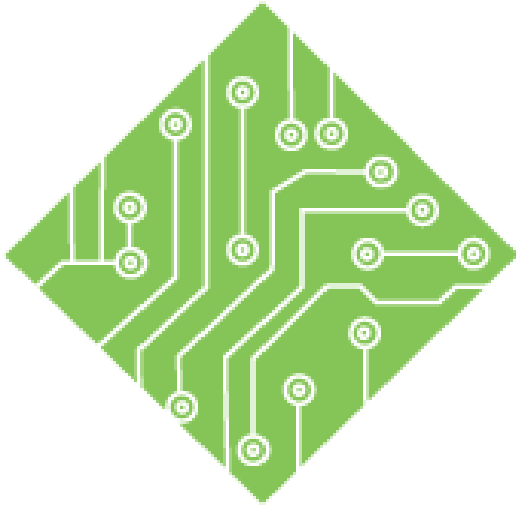
- ◆ Button names are bold and enclosed in square brackets: Example: **[Sort]**

- ◆ Information you are to type will be in bold. Example:

**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>**.



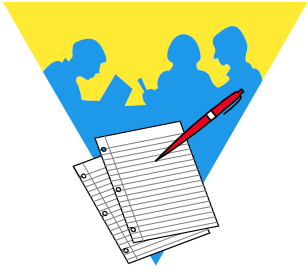


# Lesson 1: Creating and Modifying PivotTables

## Lesson Overview

You will cover the following concepts in this chapter:

- ◆ Creating PivotTables
- ◆ Modifying the PivotTable View
- ◆ Formatting PivotTables
- ◆ Refreshing PivotTables
- ◆ Creating Custom PivotTable Styles



## Lesson Notes



# PivotTables

A **PivotTable** is a powerful tool for exploring and analyzing information. A **PivotTable** can help you organize and manipulate the raw data in your spreadsheet, giving you insight into patterns or relationships that might not be obvious at first glance. **PivotTables** also give you the power to view your data in a different context without changing the original content or structure.

You can base a **PivotTable** on data in your current workbook or even external data from another source.

With a **PivotTable**, you can conveniently drag and drop columns of data into different areas of the table to examine relationships or trends that may not be obvious in a traditional Excel table or database.

In short, **PivotTables** enable you to organize your data in meaningful ways without doing a lot of tedious work. You could say that a **PivotTable** is like several data tables rolled into one.

Below is a sample of a typical **PivotTable**.

Salesperson	Country	Product Name	Total
Andrew Fuller	Argentina	Ribonbru Klosterbier	325
	<b>Argentina Total</b>		<b>477</b>
	<b>Austria</b>		
	Alice Mutton	1170	
	Carannon Tigers	2188	
	Gudbrandsdalerst	3788	
	Gumbär Gummibärchen	488	
	Macarapou Faoob	668	
	Paké chinois	1568	
	Rasul Angelo	398	
	Rösle Sauerkraut	478	
	Sesquith Ale	848	
	St Andrew's Scones	688	
	Steep éristable	538	
	Steezye Stout	148	
	<b>Austria Total</b>		<b>1888</b>
	<b>Belgium</b>		
	Chaf Antoin's Cajun Seasoning	188	
	Langile Telle	468	
	Longile Telle	208	
	Outback Lager	458	
	Singaporean Hakkan Fried Ma	428	
	Steezye Stout	1088	
	Toornale	78	
	<b>Belgium Total</b>		<b>2887</b>
	<b>Brazil</b>		
	Alice Mutton	468	
	Carannon Tigers	1188	

## Guidelines for Data in a PivotTable

- ❖ The data you wish to include in your PivotTable should be in a tabular format.
- ❖ The source data should have a row of unique column headings.
- ❖ There should be no gaps in the data, no blank columns or rows. Excel treats groups of data as a database. Gaps indicate a break in the data and are considered the end of the database.



# Creating PivotTables

## Selecting Fields for the PivotTable

To make the best use of your **PivotTable**, you should understand what the various areas in a **PivotTable** are for.

You can see by examining an empty **PivotTable Frame** that a **PivotTable** is broken into four main areas:

### Row labels

These are fields that you want to group. When you add a field to the **Row labels** area of the **Field List Task Pane**, you will see unique values extracted or filtered from these fields. Some examples of **Row** labels are product names, company names, locations or business units.

### Column labels

These are fields that show trends of data. For example, you may want to put fields that show periods, phases, time, months or years here.

### Values

This area on the **PivotTable** contains the data to be reported or analyzed. This data normally has numeric values associated with it, such as units sold, profit, or expenses. This type of data can be measured and calculated.

### Report filter

The **Report Filter** should include items that you want to filter. For example, you may want to filter regions, periods, business units, or employee names.

### Defer Layout Update

At the bottom of the **Field List Task Pane** is the option to postpone the **PivotTable** update. This turns off the **Live Preview** setting so that you don't have to wait for the screen to show potential changes. Once you have made a change or selection, click the **[Update]** button to apply the changes.



**Note**

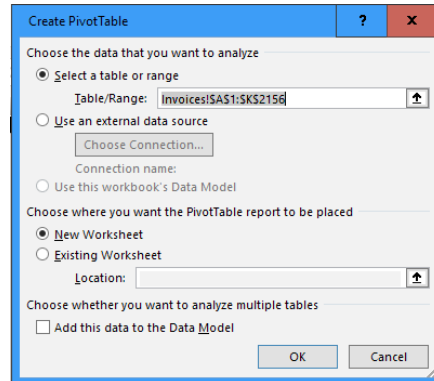
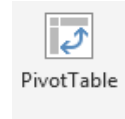
To sort the **Field List** in the **Task Pane** in alphabetical order, use the **[Options]** button on the *PivotTable Tools Analyze Tab*. At the bottom of the *Display Tab* choose the sort order using the radio buttons.



## Creating PivotTables, continued

### Creating a PivotTable

- ◆ Click into the range of data that you want to base the table on.
- ◆ Select the *Insert Tab* and click the **[PivotTable]** button to display the *Create PivotTable* dialog box.



- ◆ Choose the data you want to analyze by clicking the option button for either **Select a table or range** or **Use an external data source**. If you choose the table or range option, The **PivotTable** will be based on the Excel table or range that includes your selection.

If the range that appears is incorrect, you may type it in or select it with your mouse. Make sure that the column headings are included.

If you choose the **External Data Source** option, you can base your **PivotTable** on data outside your current workbook (such as in another workbook or perhaps an external database). If you select the **Use an External Data Source** option button, you will be able to display a drop-down list of existing connections in the *Connection Name:* field. A typical existing connection could be a Microsoft Query or a connection you previously made to an Access database for some other purpose.

#### Note

Ideally, source data for a **PivotTable** should be structured like a traditional Excel table or database. See the guidelines on page 3.

*continued on next page*

# Creating PivotTables, continued

**Note**  
 Double-clicking a cell in the **PivotTable** generates a sheet that shows the data details that contributed to that number.

- ◆ Select whether to locate your **PivotTable** in an **Existing Worksheet** or a **New Worksheet**. If you choose to locate it in an existing worksheet, you can specify the starting cell location for the upper left corner of the **PivotTable** by entering it directly into the *Location:* data field, as a cell reference, or by clicking the target cell with your mouse.

If you choose the **New Worksheet** option, your **PivotTable** will be located in cell A1 of a new worksheet that will be added to your workbook.

- ◆ Click the **[OK]** button to create your **PivotTable**.
- ◆ A **PivotTable Field List** will be placed in the same worksheet as your **PivotTable**.
- ◆ Add information to your **PivotTable** by placing check marks in the boxes next to the headings in the **PivotTable Field List**. The **PivotTable** will then be populated with the selected data.

In the example below, you could put checks next to the **Order Date** field heading, the **Product Name** field heading, and the **Extended Price** field heading to total the amount for each product by date.

	A	B	C	D	E	F	G	H	I	J
1	Company Name	Country	Salesperson	Order ID	Order Date	Required Date	Shipped Date	Product Name	Unit Price	Quantity
2146	Wolski Zajazd	Poland	Laura	10998	03-Apr-2007	17-Apr-2007	17-Apr-2007	Longlife Tofu	\$10.00	
2147	Wolski Zajazd	Poland	Laura	10998	03-Apr-2007	17-Apr-2007	17-Apr-2007	Rheinbrau Klosterbier	\$7.75	
2148	Wolski Zajazd	Poland	Margaret	11044	23-Apr-2007	21-May-2007	01-May-2007	Tarte au sucre	\$49.30	
2149	Wolski Zajazd	Poland	Michael	10611	25-Jul-2007	22-Aug-2007	01-Aug-2007	Chai	\$18.00	
2150	Wolski Zajazd	Poland	Michael	10611	25-Jul-2007	22-Aug-2007	01-Aug-2007	Chang	\$19.00	
2151	Wolski Zajazd	Poland	Michael	10611	25-Jul-2007	22-Aug-2007	01-Aug-2007	Camembert Pierrot	\$34.00	
2152	Wolski Zajazd	Poland	Nancy	10374	05-Dec-2007	02-Jan-2007	09-Dec-2007	Gorgonzola Telino	\$10.00	
2153	Wolski Zajazd	Poland	Nancy	10374	05-Dec-2007	02-Jan-2007	09-Dec-2007	Escargots de Bourgogne	\$10.60	
2154	Wolski Zajazd	Poland	Nancy	10792	23-Dec-2007	20-Jan-2007	31-Dec-2007	Chang	\$19.00	
2155	Wolski Zajazd	Poland	Nancy	10792	23-Dec-2007	20-Jan-2007	31-Dec-2007	Touitière	\$7.45	
2156	Wolski Zajazd	Poland	Nancy	10792	23-Dec-2007	20-Jan-2007	31-Dec-2007	Scottish Longbreads	\$12.50	
2157										
2158	Sum of Extended Price									
2159	Product Name		Order Date	Total						
2160	Alice Mutton		15-Jan-2007	\$62						
2161			26-Jan-2007	\$234						
2162			30-Jan-2007	\$4,602						
2163			05-Feb-2007	\$624						
2164			12-Feb-2007	\$312						
2165			16-Feb-2007	\$585						
2166			26-Feb-2007	\$468						
2167			27-Feb-2007	\$390						
2168			03-Mar-2007	\$585						
2169			13-Mar-2007	\$234						
2170			24-Mar-2007	\$234						
2171			29-Apr-2007	\$468						
2172			01-May-2007	\$3,978						
2173			08-May-2007	\$1,560						
2174			28-May-2007	\$312						
2175			10-Jun-2007	\$624						
2176			19-Jun-2007	\$702						
2177			22-Jul-2007	\$3,900						
2178			25-Jul-2007	\$936						
2179			13-Aug-2007	\$468						
2180			30-Aug-2007	\$468						

**Note:** To get this view, you will need to 'right-click' on the PivotTable and Select '**PivotTable Options**' from the list. Then click the '**Display**' tab and choose '**Classic PivotTable Layout (enables dragging of fields in the grid)**'. Click **OK**.

## Creating PivotTables, continued

### Showing More Than One Value Calculation

If you want to show both the sum and the average of the values in the **PivotTable** at the same time, do the following:

- ◆ Add a second instance of the field containing your values to the **Values Field** of the **PivotTable**.
- ◆ Click the arrow on the second instance and choose **Value Field Settings**.
- ◆ From the dialog box, choose the **Average** function.
- ◆ Click **[OK]**.

Now you have the values both being summed and averaged simultaneously. This can be revised in the *Field Settings* dialog box to any function or combination of functions needed.

The screenshot shows an Excel spreadsheet with a PivotTable. The PivotTable has two columns: 'Sum of Extended Price' and 'Average of Extended Price2'. The data is grouped by 'Alice Mutton'. Two dialog boxes are open: 'Value Field Settings' for 'Profit' (set to Average) and 'Value Field Settings' for 'Extended Price' (set to Average).

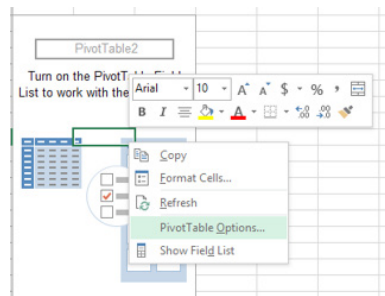
Row Labels	Sum of Extended Price	Average of Extended Price2
Alice Mutton	35482.2	958.9783784
15-Jan-2007	62.4	62.4
26-Jan-2007	234	234
30-Jan-2007	4602	1534
05-Feb-2007	624	624
12-Feb-2007	312	312
16-Feb-2007	585	585
26-Feb-2007	468	468
27-Feb-2007	390	390
03-Mar-2007	585	585
13-Mar-2007	585	585
24-Mar-2007	585	585
29-Apr-2007	585	585
01-May-2007	585	585
08-May-2007	585	585
28-May-2007	585	585
10-Jun-2007	585	585
19-Jun-2007	585	585
22-Jul-2007	585	585
26-Jul-2007	585	585

## Modifying the PivotTable View

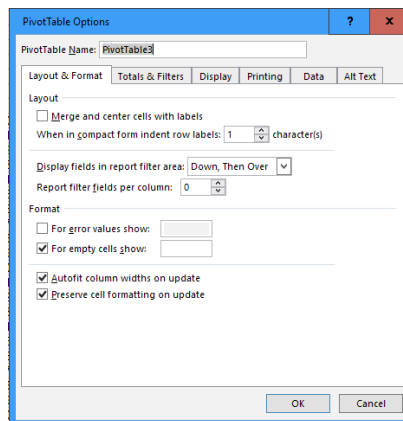
You can also create a **PivotTable** by creating an empty table frame, also known as the **Classic Layout**, and adding and arranging data in the table by dragging and dropping fields onto the frame.

### Using the Classic Layout

- ◆ Open the spreadsheet containing the data you want to work with.
- ◆ Select the range of data on which you want to base the **PivotTable**.
- ◆ Select the **Insert Tab** and click the **[PivotTable]** button to display the *PivotTable* dialog box.
- ◆ Select your choices in the *Create Pivot Table* dialog box. Make sure the *Data Range* is correct and choose a location for the table (**New Worksheet** or **Existing Worksheet**).
- ◆ Click the **[OK]** button when you are ready.
- ◆ Before adding data to the **PivotTable**, right-click on it and choose **PivotTable Options** from the shortcut menu.



This will display the *PivotTable Options* dialog box.

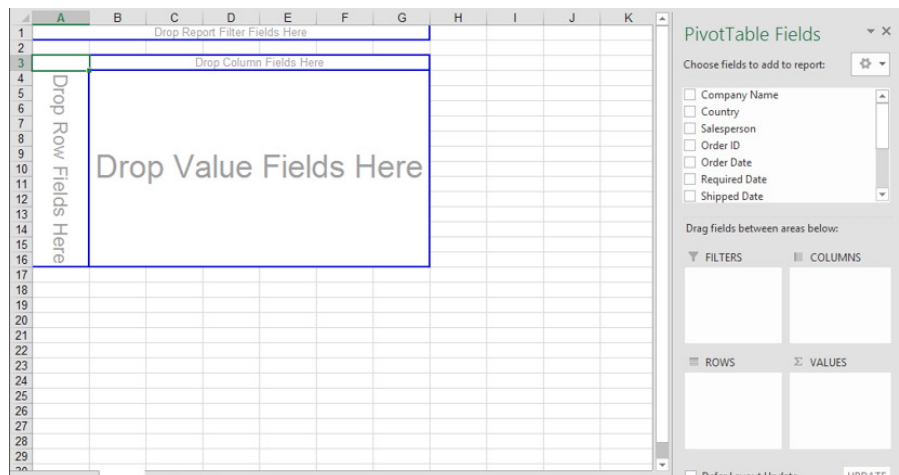


## Modifying the PivotTable View, continued

- ◆ In the *Options* box, choose the *Display Tab*.
- ◆ Click the checkbox before **Classic PivotTable layout (enables dragging of fields in the grid)**.
- ◆ Click [OK].

This will change the **PivotTable** into a classic **PivotTable** frame. If you are already working with a classic PivotTable frame, you can clear this checkbox to convert it to an Excel 2016 style **PivotTable**.

Below, you can see an empty **PivotTable frame** enhanced with blue borders. Beside it, to the right, you can see the **PivotTable Fields**.

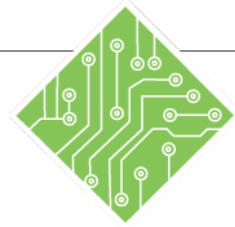


- ◆ From the **PivotTable Fields**, drag the **Field Names** to the appropriate area on your **PivotTable**.

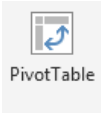
The order in which you drag them will determine which field will appear first, second, etc. You can re-order the fields by selecting and dragging them within the field area.

By default, fields that are dropped into the **Value Fields** area will sum if there are no blanks in the data. If any value areas in the original data are left blank, Excel considers this text, rather than a value, and the default calculation will be to count. You can change this option as you will learn later in this chapter.

## Action 1.1 - Creating a PivotTable and Arranging Data in the Classic Layout



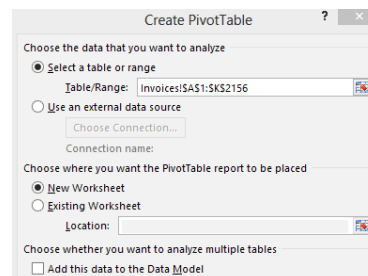
### Instructions:

1. Open the workbook named **Shipping.xlsx** from your exercise files folder.
2. Click anywhere in the data on the **Invoices** sheet.
3. Select the **Insert Tab** and click the **[PivotTable]** button. 
4. Verify that the **Select a table or range** option button is chosen and the correct range is entered in the **Table/Range** field.
5. Make sure that the **New Worksheet** option button is selected.
6. Click the **[OK]** button to create the **PivotTable**.
7. **Right-click** on the **PivotTable** graphic and choose **PivotTable Options** from the shortcut menu.
8. On the **Display** tab in the **PivotTable Options** dialog box, put a check in the **Classic PivotTable layout (enables dragging of fields in the grid)** checkbox.
9. Click **[OK]**. You should now see a new **PivotTable Frame** in the new worksheet.

### Results/ Comments:

Notice the first row is a set of column headings, with one heading for each column. (**The data set does not contain any empty cells.**)

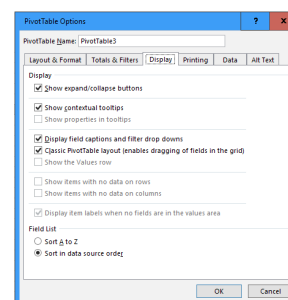
The **Create PivotTable** dialog box is displayed. The **Table/Range:** text box should show **Invoices!\$A\$1:\$K\$2156**.



You will see a **PivotTable Area** and a **Field List** appear in a new worksheet. Notice the column headings (fields) available in the **PivotTable Field List** that you can now add to the table.

To open the **PivotTable Options** dialog box. Do not click outside of the **PivotTable** or **PivotTable Frame**, or you will deactivate the **PivotTable** and the related **Ribbon** tabs will disappear.

Notice that **Country** went into the **Filters** area of the **PivotTable Field List Pane**.



## Action 1.1 - Creating a PivotTable and Arranging Data in the Classic Layout, continued



### Instructions:

11. Arrange the data as follows:

- Drag the **Country** field from the **PivotTable Field List** to the **Drop Report Filter Fields Here** area of the **PivotTable**.
- Drag the **Salesperson** field to the **Drop Rows Fields Here Area** of the **PivotTable**.
- Drag the **Product Name** field to the **Drop Columns Here Area** of the table.
- Drag the **Unit Price** field to the **Drop Value fields Here Area** of the table. Your spreadsheet should look like this:

### Results/ Comments:

**Salesperson** is also in the *Row* area of the **PivotTable Field List**.

**Product Name** is also in the *Column* area of the **PivotTable Field List**.

**Unit Price** is placed in the **Values** area of the **PivotTable Field List** and automatically sums.

Country	(All)				
Sum of Unit Price	Product Name				
Salesperson	Alice Mutton	Aniseed Syrup	Boston Crab Meat	Camembert Pierrot	Carnarvon Tigers
Andrew Fuller		257.4		36.8	204
Anne Dodsworth		39	20	36.8	102
Janet Leverling		171.6	20	176.6	326.4
Laura Callahan		148.2	10	69.9	88.4
Margaret Peacock		351	18	187.6	340
Michael Suyama			10	36.8	68
Nancy Davolio		78	28	80.9	353.6
Robert King		187.2	8	47.8	68
Steven Buchanan		117		33.1	88.4
<b>Grand Total</b>		<b>1349.4</b>	<b>114</b>	<b>706.3</b>	<b>1638.8</b>

12. Save your workbook as **MyPivotTable** in your exercise folder.

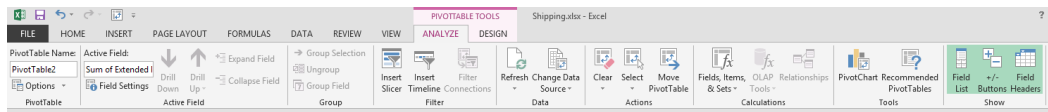
13. Leave the file open.

The **[F12]** key is the shortcut key for the **Save As** command.

# Formatting PivotTables

## Using the PivotTable Options Dialog Box

- Click on any cell in the **PivotTable** to display the *Analyze Tab* in the **Ribbon**.



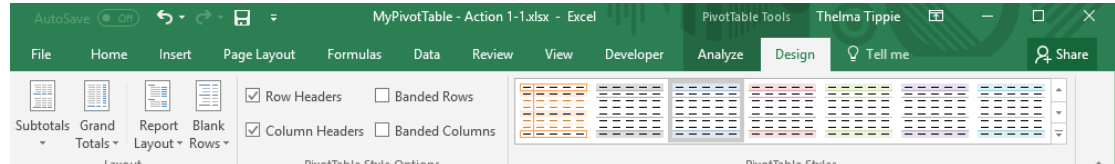
**Note**  
Remember to always click into the **PivotTable** to see the related contextual tabs on the *Ribbon*.

- On the left side of the *Analyze Tab*, in the **PivotTable** group, click the **[Options]** button to display the *PivotTable Options* dialog box.
- On the *Layout and Format* tab, make sure the **Preserve cell formatting on update** box is checked. This will ensure that any formatting you apply will be retained if the table is modified or refreshed.
- On the *Totals and Filters* tab, specify if **grand totals for rows** or **columns** will be shown.
- On the *Display* tab, select whether filter drop-downs, field captions, expand/collapse buttons, and contextual tool tips will be shown.
- On the *Printing* tab determine what optional elements should print.
- On the *Data* tab, specify **PivotTable Data** options, such as having the table refreshed when the workbook opens.
- Click **[OK]** when you are finished with the *PivotTable Options* dialog box.

## Formatting PivotTables, continued

### Using the Design Tab

- On the *Design Tab*, you can click on one of the preset styles in the **PivotTable Styles Gallery** to quickly apply preset formatting to the table.



- There are also checkboxes in the **PivotTable Style Options** group of the ribbon that will let you turn on or off banded columns or rows, row headers, or column headers.
- On the left side of the ribbon are controls that you can use to view or hide subtotals and grand totals and to specify the **PivotTable Report Layout**.

Here is a style with banded columns applied to an existing **PivotTable**.

Salesperson	Andrew Fuller	Anna Dodsworth	Janet Leverling	Laura Callahan	Margaret Peacock	Michael S.
	6162	624	3525.6	2847	9672	
		740	800	300	220	
	920	644	6972.2	975	5024.4	
	6324	1496	12036	2951.2	10159.2	
	6750	3250	4187.5	3312.5	8950	
	1620	630	2163.6	1072.8	4327.2	
	1235	494	1729	1254	5019.8	
	1440	180	1789.2	1350	1944	

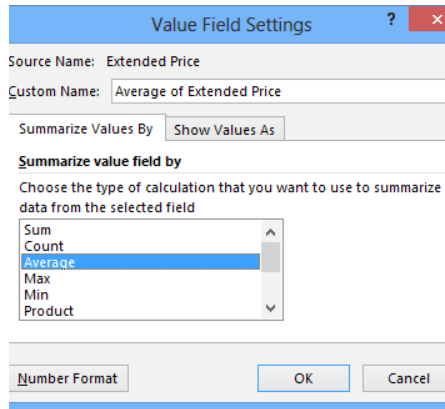
### Other Formatting Options

If you would like to apply specific formatting to a table that is not available as a style, you can always select a range of cells from the table and use the buttons on the *Home Tab* to format the selected range.

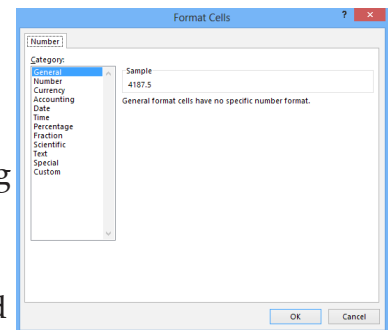
Another method is to select a range of cells from the table, right-click in the selected range, and choose **Format Cells** from the shortcut menu. You can then choose from a series of tabs in the *Format Cells* dialog box that will let you select number formats, alignment choices, font styles, borders, fill and protection options.

# Formatting PivotTables, continued

- ◆ To format the data values in the **PivotTable**, right-click a cell in the data area of the populated table and select the *Value Field Settings* option from the pop up menu.



- ◆ When you see the *Value Field Settings* dialog box, click the **[Number Format]** button to view the number formatting options.
- ◆ Here, you can select a number format from the list and click **[OK]** to return to the *Value Field Settings* dialog box.
- ◆ Click **[OK]** again to format all of the data in the selected field of the **PivotTable** with the chosen number format.



The image below shows a **PivotTable** with the accounting number format applied to the data area. Notice also that the names of Janet Leverling and Laura Callahan in the row area of the table have been formatted in bold by using the **[Bold]** button on the *Home Tab*.

1	Country	(All)			
2					
3	Sum of Unit Price	Product Name			
4	Salesperson	Alice Mutton	Aniseed Syrup	Boston Crab Meat	Grand Total
5	Andrew Fuller	\$ 257.40		\$ 36.80	\$ 294.20
6	Anne Dodsworth	\$ 39.00	\$ 20.00	\$ 36.80	\$ 95.80
7	<b>Janet Leverling</b>	\$ 171.60	\$ 20.00	\$ 176.60	\$ 368.20
8	<b>Laura Callahan</b>	\$ 148.20	\$ 10.00	\$ 69.90	\$ 228.10
9	Margaret Peacock	\$ 351.00	\$ 18.00	\$ 187.60	\$ 556.60
10	Michael Suyama		\$ 10.00	\$ 36.80	\$ 46.80
11	Nancy Davolio	\$ 78.00	\$ 28.00	\$ 80.90	\$ 186.90
12	Robert King	\$ 187.20	\$ 8.00	\$ 47.80	\$ 243.00

## Refreshing PivotTables

The data in a **PivotTable** is not linked directly to the source table or range. Instead, the **PivotTable** is based on a hidden copy of the source data that is kept in memory by Excel. This is called the **PivotTable Cache**. This means that changes to the original source list or database will not be automatically updated in the **PivotTable**. If you make changes in the source data, you must **Refresh** the **PivotTable** to update it.

### Refreshing a PivotTable

- ◆ Select the *Data Tab* or the *PivotTable Analyze Tab*
  - ◆ Click the **[Refresh]** button.
- OR-
- ◆ Right-click on a cell in the data area of the table to access the shortcut menu.
  - ◆ Select **Refresh**.

Note

**[Alt + F5]** refreshes the **PivotTable**.

Here is a range of data and a **PivotTable** that uses the data range as its source.

	C	H	I	J	K	L	M	N	O
1	Salesperson	Product Name	Unit Price	Quantity	Extended Price				
2	Nancy Davolio	Raclette Courdavault	\$55.00	15	\$825.00		Sum of Extended Price	Product Name	
3	Nancy Davolio	Original Frankfurter grüne Soße	\$13.00	2	\$26.00		Salesperson	Raclette Courdavault	Grand Total
4	Nancy Davolio	Grandma's Boysenberry Spread	\$25.00	16	\$400.00		Andrew Fuller		6644 6644
5	Nancy Davolio	Rössle Sauerkraut	\$45.60	2	\$91.20		Anne Dodsworth		14751 14751
6	Janet Leverling	Escargots de Bourgogne	\$13.25	40	\$530.00		Janet Leverling		5159 5159
7	Janet Leverling	Flötensost	\$21.50	20	\$430.00		Laura Callahan		6105 6105
8	Michael Suyama	Rössle Sauerkraut	\$45.60	15	\$684.00		Margaret Peacock		12386 12386
9	Michael Suyama	Chartreuse verte	\$18.00	21	\$378.00		Michael Suyama		7348 7348
10	Michael Suyama	Spegesild	\$12.00	2	\$24.00		Nancy Davolio		5412 5412
11	Margaret Peacock	Veggie-spread	\$43.90	20	\$878.00		Robert King		10571 10571
12	Margaret Peacock	Aniseed Syrup	\$10.00	6	\$60.00		Steven Buchanan		7920 7920
13	Margaret Peacock	Lakkalikööri	\$18.00	15	\$270.00		Grand Total		76296 76296

If you change the quantity for Nancy Davolio's first entry from 15 to 500 on the spreadsheet, you will notice no change in the PivotTable. (The data in cell J2 has been changed to 500 and the Extended Price has re-calculated to \$27,500.00 but the PivotTable has not changed.)

	C	H	I	J	K	L	M	N	O
1	Salesperson	Product Name	Unit Price	Quantity	Extended Price				
2	Nancy Davolio	Raclette Courdavault	\$55.00	500	\$27,500.00		Sum of Extended Price	Product Name	
3	Nancy Davolio	Original Frankfurter grüne Soße	\$13.00	2	\$26.00		Salesperson	Raclette Courdavault	Grand Total
4	Nancy Davolio	Grandma's Boysenberry Spread	\$25.00	16	\$400.00		Andrew Fuller		6644 6644
5	Nancy Davolio	Rössle Sauerkraut	\$45.60	2	\$91.20		Anne Dodsworth		14751 14751
6	Janet Leverling	Escargots de Bourgogne	\$13.25	40	\$530.00		Janet Leverling		5159 5159
7	Janet Leverling	Flötensost	\$21.50	20	\$430.00		Laura Callahan		6105 6105
8	Michael Suyama	Rössle Sauerkraut	\$45.60	15	\$684.00		Margaret Peacock		12386 12386
9	Michael Suyama	Chartreuse verte	\$18.00	21	\$378.00		Michael Suyama		7348 7348
10	Michael Suyama	Spegesild	\$12.00	2	\$24.00		Nancy Davolio		32087 32087
11	Margaret Peacock	Veggie-spread	\$43.90	20	\$878.00		Robert King		10571 10571
12	Margaret Peacock	Aniseed Syrup	\$10.00	6	\$60.00		Steven Buchanan		7920 7920
13	Margaret Peacock	Lakkalikööri	\$18.00	15	\$270.00		Grand Total		102971 102971



# Refreshing PivotTables, continued

Here is the same data and **PivotTable** after it has been refreshed. Notice that cell **N10** has now changed.

	C	H	I	J	K	L	M	N	O
1	Salesperson	Product Name	Unit Price	Quantity	Extended Price		Sum of Extended Price	Product Name	
2	Nancy Davolio	Raclette Courdavault	\$55.00	500	\$27,500.00				
3	Nancy Davolio	Original Frankfurter grüne Soße	\$13.00	2	\$26.00		Salesperson	Raclette Courdavault	Grand Total
4	Nancy Davolio	Grandma's Boysenberry Spread	\$25.00	16	\$400.00		Andrew Fuller		6644
5	Nancy Davolio	Rössle Sauerkraut	\$45.60	2	\$91.20		Anne Dodsworth		14751
6	Janet Leverling	Escargots de Bourgogne	\$13.25	40	\$530.00		Janet Leverling		5159
7	Janet Leverling	Flotemysost	\$21.50	20	\$430.00		Laura Callahan		6105
8	Michael Suyama	Rössle Sauerkraut	\$45.60	15	\$684.00		Margaret Peacock		12386
9	Michael Suyama	Chartreuse verte	\$18.00	21	\$378.00		Michael Suyama		7348
10	Michael Suyama	Spegesild	\$12.00	2	\$24.00		Nancy Davolio		32087
11	Margaret Peacock	Vegie-spread	\$43.90	20	\$878.00		Robert King		10571
12	Margaret Peacock	Aniseed Syrup	\$10.00	6	\$60.00		Steven Buchanan		7920
13	Margaret Peacock	Lakkalikööri	\$18.00	15	\$270.00		Grand Total		102971



## Action 1.2 - Formatting PivotTable Data



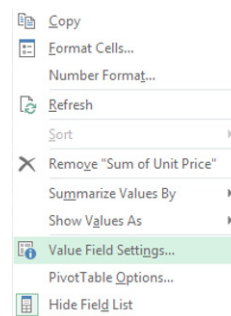
### Instructions:

1. You should still have **MyPivotTable.xlsx** open with the **PivotTable** showing from the previous exercise.
2. Right-click on the **Sum of Unit Price** heading in the upper left corner of the table.
3. Click the **Value Field Settings** option from the shortcut menu.
4. Click on the **[Number Format]** button, in the bottom left corner of the dialog box.
5. Choose the **Accounting** format option from the list on the left. Leave the defaults as shown in the figure to the right.
6. Click the **[OK]** button in the lower right of the *Format Cells* dialog box.

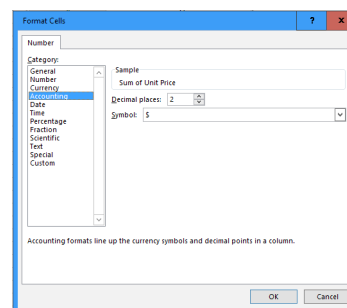
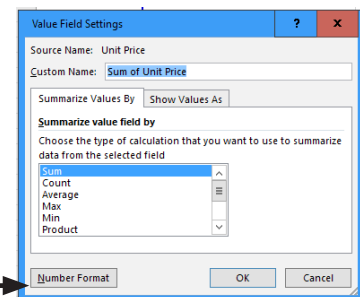
### Results/ Comments:

If not, open it from the **Student Data** folder.

To display the shortcut menu as shown below.

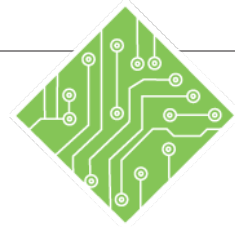


This will display the *Value Field Settings* dialog box.



You will be returned to the *Value Field Settings* dialog box.

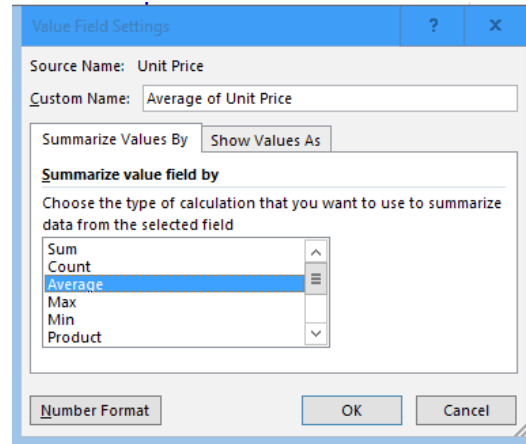
## Action 1.2 - Formatting PivotTable data, continued



### Instructions:

7. Select **Average** from the *Summarize value field by* list
8. Click [OK].
9. Resize the columns so that your **PivotTable** looks like the figure below:
10. Save your file.

### Results/ Comments:



A quick way to do this is to use the [Select] button on the *Analyze Tab*. Select the **Entire PivotTable**. Then use the [Format] button on the *Home Tab* to **Autofit Column Width**.

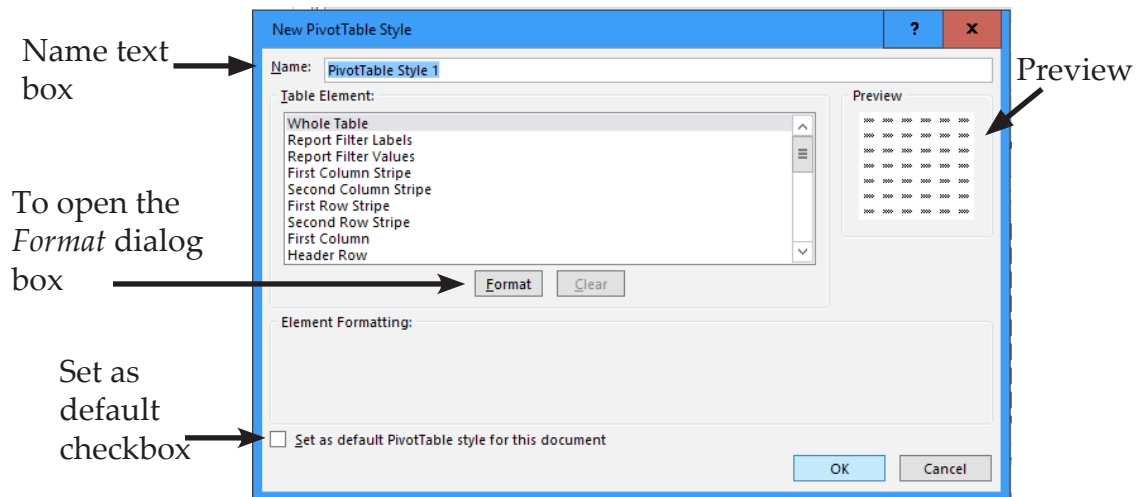
[Ctrl+S]

	A	B	C	D	E	F
1	Country	(All)				
2						
3	Average of Unit Price	Product Name				
4	Salesperson	Alice Mutton	Aniseed Syrup	Boston Crab Meat	Camembert Pierrot	Carnarvon Tigers
5	Andrew Fuller	\$ 36.77		\$ 18.40	\$ 34.00	\$ 62.50
6	Anne Dodsworth	\$ 39.00	\$ 10.00	\$ 18.40	\$ 34.00	\$ 62.50
7	Janet Leverling	\$ 34.32	\$ 10.00	\$ 17.66	\$ 32.64	\$ 59.38
8	Laura Callahan	\$ 37.05	\$ 10.00	\$ 17.48	\$ 29.47	\$ 58.33
9	Margaret Peacock	\$ 35.10	\$ 9.00	\$ 17.05	\$ 30.91	\$ 59.38
10	Michael Suyama		\$ 10.00	\$ 18.40	\$ 34.00	
11	Nancy Davolio	\$ 39.00	\$ 9.33	\$ 16.18	\$ 32.15	\$ 56.25
12	Robert King	\$ 37.44	\$ 8.00	\$ 15.93	\$ 34.00	\$ 62.50
13	Steven Buchanan	\$ 39.00		\$ 16.55	\$ 29.47	
14	<b>Grand Total</b>	<b>\$ 36.47</b>	<b>\$ 9.50</b>	<b>\$ 17.23</b>	<b>\$ 32.13</b>	<b>\$ 59.72</b>

## Creating Custom PivotTable Styles

### Creating a Custom PivotTable Style

- ◆ Click on any cell in the table to display the *Design Tab* on the **Ribbon**.
- ◆ In the **PivotTable Styles Gallery**, click on the **[More]** button.
- ◆ At the bottom of the **Styles** gallery, click on **New PivotTable Style**. This will open the *New PivotTable Style* dialog box.



#### Note

To rename the **PivotTable** itself, use the **PivotTable Name text box** in the *PivotTable Tools Analyze Tab*.

PivotTable Name:

PivotTable1

- ◆ In the *Name:* text box, type an appropriate name for your PivotTable style.
- ◆ Use the *Table Element:* list to select an element of the PivotTable, then click on the **[Format]** button to open the *Format Cells* dialog box.
- ◆ In the *Format Cells* dialog box, click on one of the tabs to change the *Font*, *Border*, or *Fill* for that element.
- ◆ Click the checkbox to **Set as default PivotTable quick style for this document** if you wish all **PivotTables** in the current workbook to have this style.

Notice that your changes will show in the **Preview** window of the *New PivotTable Style* dialog box.

- ◆ Once you have made all of your selections, click **[OK]** to close the dialog box.



# Creating Custom PivotTable Styles, continued

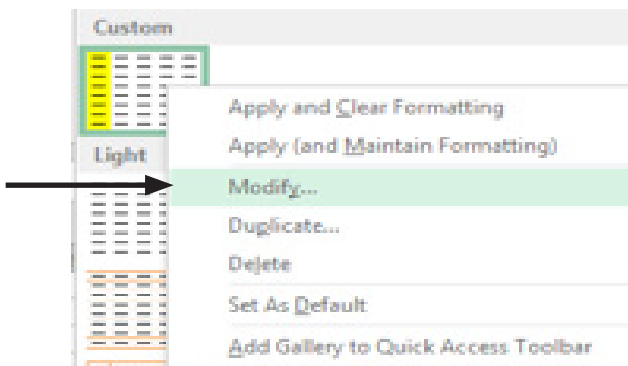
## Applying a Custom PivotTable Style

- ◆ Click on any cell in the **PivotTable**.
- ◆ Select your custom **PivotTable Style** from the **Custom** section at the top of the **PivotTable Styles Gallery**.

**Note**  
Once created, your custom **PivotTable** style will *not* be applied automatically. You must click on it in the gallery to apply it.

## Modifying a Custom PivotTable Style

- ◆ Click on any cell in the **PivotTable**.
- ◆ Right-click on your custom **PivotTable Style** in the **Custom** section of the **PivotTable Styles** gallery.
- ◆ Select **Modify**.



- ◆ When the *Modify PivotTable Style* dialog box opens, make the appropriate changes by, once again, selecting the *Table Element*: and then clicking on the **[Format]** button.
- ◆ Click **[OK]** when you have completed the modifications.

**Note**  
You can set any **PivotTable** quick style from the **PivotTable Styles Gallery** as the default style by right-clicking on it and selecting **Set As Default**.





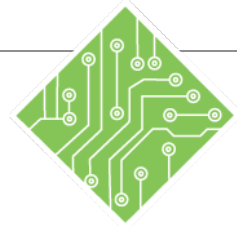
## Using Custom PivotTable Styles

### Using a PivotTable Style in Another Workbook

- ◆ Select the **PivotTable** in the originating workbook with the style you would like to use.
- ◆ Copy it.
- ◆ Paste it into the workbook where you would like to use the **PivotTable Style**.
- ◆ Click on the PivotTable and create a **New PivotTable Style** using the **New PivotTable Style** menu item from the **PivotTable Style Gallery**.
- ◆ Click the checkbox at the bottom of the *New PivotTable Quick Style* dialog box to **Set as default PivotTable quick style for this document**.
- ◆ Delete the **PivotTable** from which you copied the style.



## Action 1.3 - Creating a Custom PivotTable Style



### Instructions:

1. You should still have **MyPivotTable.xlsx** open.
2. Click anywhere in the **PivotTable**.
3. On the *PivotTable Tools Design* tab, click on the **[More]** button on the **PivotTable Styles** gallery.
4. Select **New PivotTable Style...** from the bottom of the gallery.
5. In the *New PivotTable Quick Style* dialog box, in the *Name:* text box, type **My New PivotTable Style**.
6. Select **Whole Table** from the *Table Element:* list.
7. Click on the **[Format]** button.
8. On the *Font* tab, click the dropdown arrow on *Color:* and select **Dark Blue, text 2** from the **Theme Colors** palette.
9. On the *Border* tab, select **Outline** from the *Presets*.
10. Click **[OK]**.
11. From the *Table Element:* list, select **Header Row**.
12. Click on the **[Format]** button.
13. On the *Font* tab, click on the down arrow for *Color:* and select white.

### Results/ Comments:

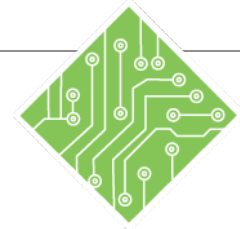
If not, open it from your Student Data Folder.



This will display the *New PivotTable Style* dialog box.

To name your new style.

Notice the **Preview** window in the *New PivotTable Style* dialog box changes.



**Instructions:**

14. On the *Fill* tab, select the **medium blue** color from the **Theme Colors** at the top of the **Color Palette**.
15. Click **[OK]**.
16. Click **[OK]** again.
17. On the *PivotTable Tools Design* tab, click the **[More]** button on the **PivotTable Styles** gallery.
18. Select **My New PivotTable Style** from the **Custom** section at the top of the gallery.
19. On the **PivotTable Styles** gallery, right-click on **My New PivotTable Style** and select **Modify**.
20. Select **Grand Total Row** from the *Table Element:* list.
21. Click the **[Format]** button.
22. On the *Font* tab, select **Bold Italic** from the *Font Style:* list.
23. Click **[OK]**.
24. Select **First Column**.
25. Click on the **[Format]** button.
26. On the *Fill* tab, select the second accent color under the orange **Theme Color**.
27. Click **[OK]**, then click **[OK]** again.

**Results/ Comments:**

Notice the **Preview** window in the *New PivotTable Style* dialog box changes.

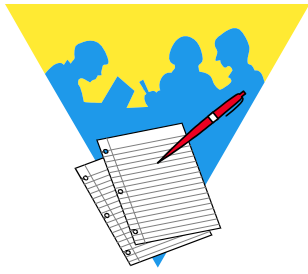
The new style is applied to the existing **PivotTable**.

This will open the *Modify PivotTable Style* dialog box.

This will bold and italicize the **Grand Totals** at the bottom of the **PivotTable**.

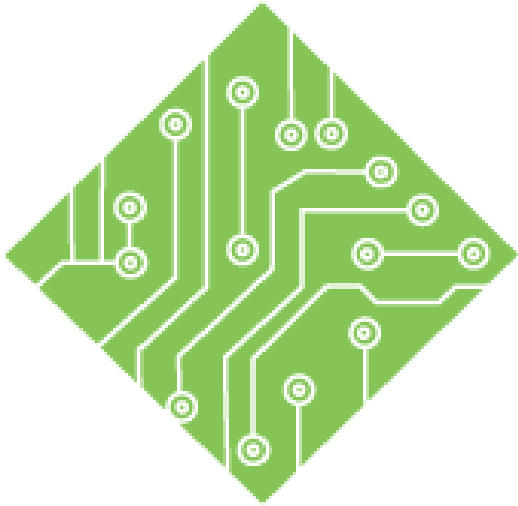
This will shade the first column of the **PivotTable**.

Your **PivotTable Style** modifications are applied to the **PivotTable**.



## Lesson Notes



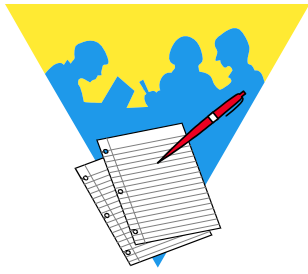


## **Lesson 2: Filtering & Modifying PivotTables Fields**

### **Lesson Overview**

You will cover the following concepts in this chapter:

- ◆ Filtering a PivotTable
- ◆ Grouping Data in a PivotTable
- ◆ Conditional Formatting in a PivotTable
- ◆ Using Slicers



## Lesson Notes



# Filtering a PivotTable

**Note**  
 A **Value** filter allows you to apply a filter to numerical data. A **Label** filter allows you to apply a filter to textual data referred to in row or column labels.

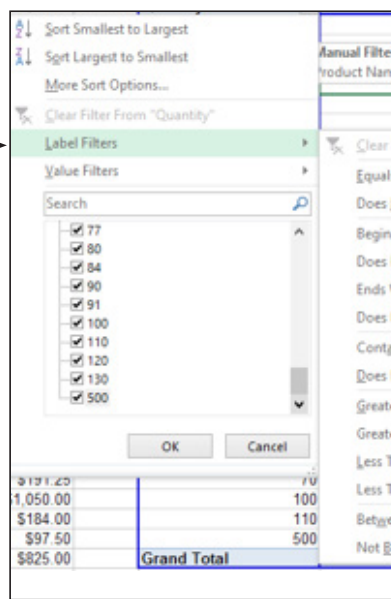
One of the main features of a **PivotTable** is that you have the ability to present the data in a dynamic format that allows you to show exactly what you need and change it when you need to. For example, if you have a **PivotTable** that shows **Sales by Region** for each **Salesperson**, you may want to show only specific **Salespersons** or specific **Regions**. **PivotTables** allow you the flexibility to show each **Region** and/or **Salesperson** and to change which **Salesperson** or which **Region** shows at any time.

## Filtering a PivotTable

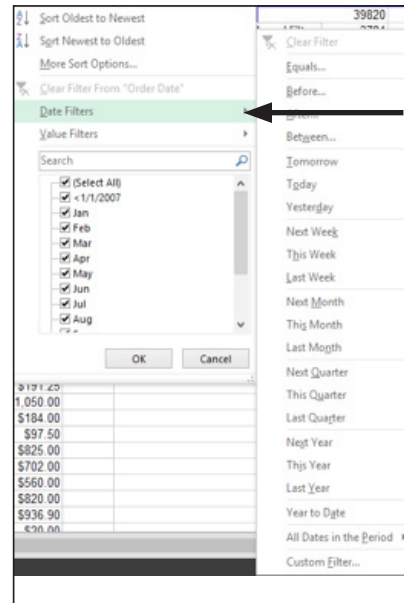
- Click on the drop-down arrow next to any field name in the **PivotTable**.

Excel will determine what data type the data in the column belongs to. If it is a *numerical* data type, you will see **Label** and **Value** filters. If it is a *date* data type, you will see **Date** and **Value** filters.

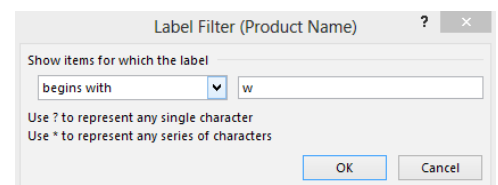
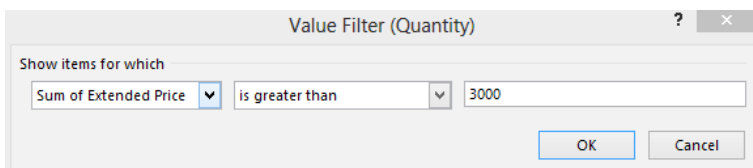
Filter menu for number data type



Filter menu for Date data type



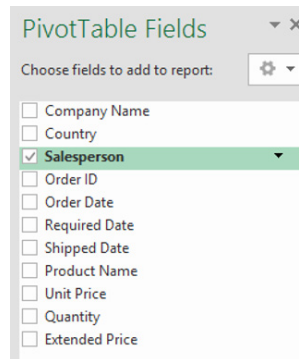
- Select the **Filter** type you would like to use.
- Complete the information in the *Filter* dialog box.



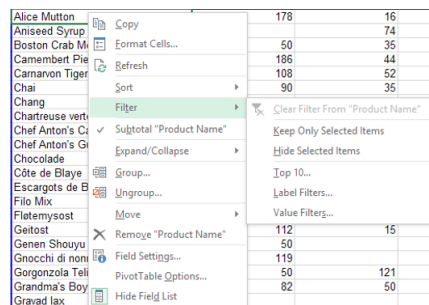
# Filtering a PivotTable, continued

- OR -

- Click on the drop-down arrow next to any field name in the **PivotTable Fields**.



- Select the **Filter** type you would like to use (**Value** or **Label**).
- Select the **Filter** subtype.



- Complete the information in the *Filter* dialog box.

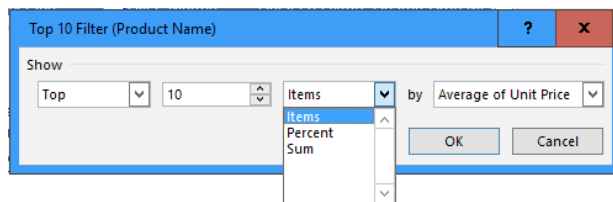
## Filtering a PivotTable, continued

### Using the Top or Bottom 10

Sometimes you would like to see the **Top 10** purchasers of your product or the **Top 10** salespeople in your organization. You can use the **Top 10** filter in the **Values Filters** to see these results.

#### To Filter the Top 10

- ◆ Click on the drop-down arrow next to any field name in the **PivotTable**.
- ◆ Trace over **Value Filters** from the drop-down list.
- ◆ Select **Top 10...** from the submenu. The following dialog box is displayed.



- ◆ In the *Top 10 Filter* dialog box, select whether or not you wish to show the **Top** or **Bottom 10** by clicking on the drop-down arrow.
- ◆ If needed, change the number of items being shown by using the arrows in the spin box to change the number or by selecting the number and typing it in.
- ◆ Finally, select whether you wish to see the **Top/Bottom 10 items** or **Top/Bottom 10 percent**.

Select **Sum** to display what contributed to the top number you selected. For example if you want to see which companies contributed to the top \$100,000 in sales, enter 100,000 in the number box and choose **Sum** from the drop-down.

# Filtering a PivotTable, continued

## Using Wildcards

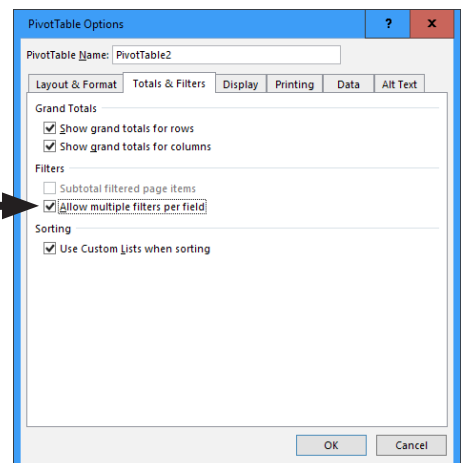
When you can only specify a portion of what you are filtering, you can use wildcards to replace the missing text. For example, if you wish to search for all names that begin with an M and end with a T, you can enter M\*T. The asterisk represents any number of characters in that position. The following wildcards may be used in your filters:

Character	Definition	Example
*	Used to represent any number of characters in that position, including zero characters.	M*T will return Matt, mint, malt, mutt, most.
?	Represents one character in that position.	M?T will return mat or met.
~	Searches for wildcard characters.	Computer~Workshop will return Computer*Workshop.

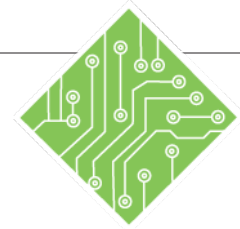
## Using Multiple Filters

Sometimes, you may want to apply multiple filters simultaneously. By default, Excel will remove a filter on a field when another filter is applied. To maintain your filters while you create additional filters:

- ◆ Right-click any cell in your PivotTable.
- ◆ Select *PivotTable Options*.
- ◆ Click the **Totals and Filters** tab in the dialog box.
- ◆ Click the checkbox for **Allow multiple filters per field**.



## Action 2.1 - Filtering a PivotTable

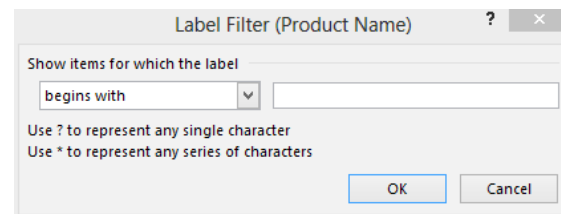


### Instructions:

1. You should still have **MyPivotTable.xlsx** open.
2. Click on the **Filter** button drop-down arrow next to **Product Name** in the **PivotTable**.
3. Choose **Label Filters** and then trace to **Begins with...**
4. Click into the text box and type **c**.
5. Click **[OK]**.
6. Right-click on any one of the **Product Names** in the **PivotTable**.
7. Trace to **Filter**, then click on **Value Filters...**
8. Verify that **Average of Unit Price** and **is greater than** appears in the *Show items for which* lists. If not, use the drop-down arrows to select them.
9. Type **40** in the text box.
10. Click **[OK]**.
11. Save the file, but do not close it.

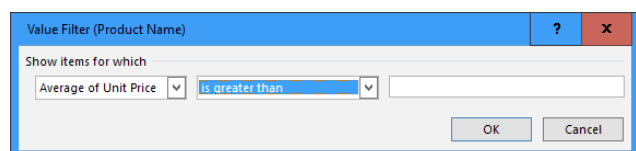
### Results/ Comments:

First, you will filter the **PivotTable** to show only those products that begin with a **"C"**.



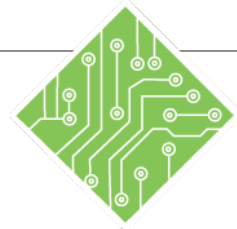
The **PivotTable** will refresh itself and show only those products that begin with a **"C"**.

Next, you will filter the **PivotTable** to show those products with **Average Unit Prices** greater than **\$40**.



The **PivotTable** will refresh itself and show only those products with **Average Unit Prices** greater than **\$40**.

## Action 2.2 - Filtering the Bottom 10 in a PivotTable

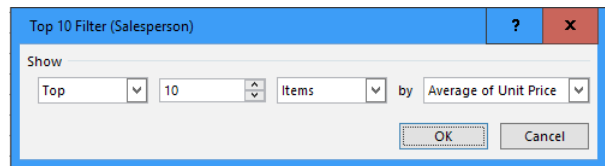
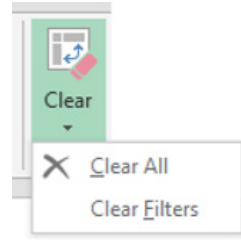


### Instructions:

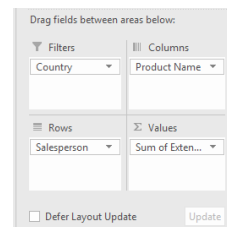
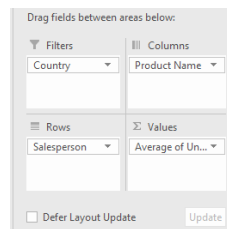
1. You should still have **MyPivotTable.xlsx** open.
2. Click the drop-down arrow on the **[Clear]** button in the *Analyze Tab*.
3. Select **Clear Filters**.
4. Trace over **Salesperson** in the **PivotTable Field List**.
5. Click on the down arrow.
6. Trace to **Value Filters** and then select **Top 10...** from the submenu.
7. Change **Top** to **Bottom**, using the drop-down arrow.
8. Change **10** to **5**.
9. Click **[OK]**.
10. Repeat steps 2 and 3 to clear the filter.
11. Drag **Average of Unit Price** out of the **Values** area in the **PivotTable Field List Task Pane**.
12. Drag **Extended Price** into the **Values** area in the the **PivotTable Field List Task Pane**.

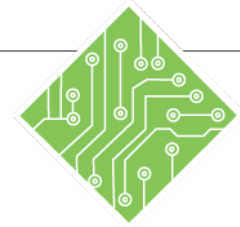
### Results/ Comments:

If not, open it from the **Student Data** folder.



This will show the **Bottom 5 Sales** performers.





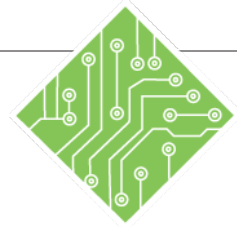
**Instructions:**

13. Change the **Value Field Settings** for the **Extended Price** to a **Currency** format.
  
14. Click on the **Filter** button for **Salesperson** in the **PivotTable**.
  
15. Trace to **Value Filters** and then select **Top 10...** from the submenu.
  
16. Change **10** to **500000** (**don't** click [OK] yet).
  
17. Change **Items** to **Sum**, using the drop-down arrow.
  
18. Click [OK].
  
19. Clear the filters again.
  
20. Save the file, but do not close it.

**Results/ Comments:**

- ◆ In the **Values** area of the **PivotTable Field List Task Pane**, click on the down arrow next to **Sum of Extended Price**.
- ◆ From the submenu, select **Value Field Settings**.
- ◆ Click on the **[Number Format]** button (bottom left corner of the dialog box).
- ◆ Under *Category*, choose **Currency**.
- ◆ Click [OK]. Click [OK] again.

This will show all of the the **Products** and **Salespeople** that contributed to the company's top \$500,000 in sales.



**Instructions:**

1. You should still have **MyPivotTable.xlsx** open.
2. Click on the **Filter** button for **Salesperson**.
3. Select **Label Filters** and then **Equals...** from the menu and submenu.
4. Type **A\*R** in the text box.
5. Click **[OK]**.
  
6. Clear the filter.
7. Save your file.

**Results/ Comments:**

If not, open it from the **Student Data** folder.

The filter is not case-sensitive.

Notice that the **PivotTable** is filtered to show **Andrew Fuller**, but not **Anne Dodsworth** because her name does not end with an **r**.

## Filtering a PivotTable, continued

### Using Multiple Report Filters

The **Report Filter** will give you a high level summary and can include multiple combinations of fields. To filter by more than one field, you can add multiple report filters to the **PivotTable Field List**, just as you can add multiple row or column fields.

- ◆ When filtering by more than one field, click and drag the field to the **Filters** section of the **PivotTable Fields** pane.
- ◆ Place them in the order you wish them to appear in the **PivotTable** or click and drag them to the correct position in the list.
- ◆ You can now filter by each field independently and combine filters.

Drag fields between areas below:

▼ FILTERS

Country ▼

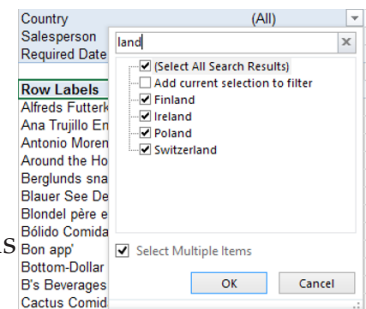
Salesperson ▼

Required Date ▼

Country	(All)	▼
Salesperson	(All)	▼
Required Date	(All)	▼
<b>Row Labels</b>	<b>Sum of Quantity</b>	
Alfreds Futterkiste		174
Ana Trujillo Emparedados y helados		63
Antonio Moreno Taquería		359
Around the Horn		650
Berglunds snabbköp		1001
Blauer See Delikatessen		140
Blondel père et fils		666
Bólido Comidas preparadas		190
Bon app'		980
Bottom-Dollar Markets		956

### Using the Search Box to Apply a Filter

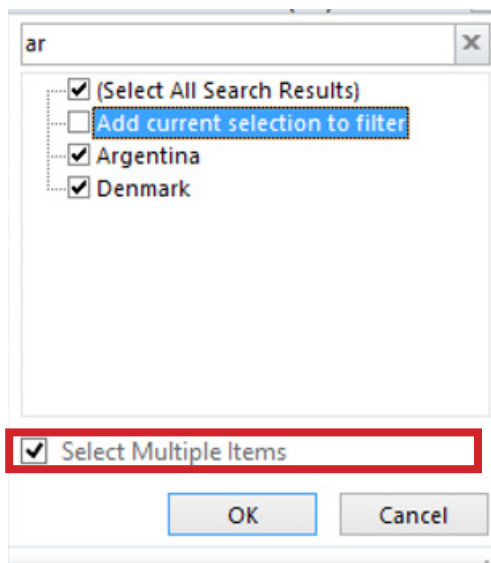
- ◆ First, from one of the Filter drop-down buttons, select the **Multiple Items** check box, which will activate the checkbox for each selection.
- ◆ Type in the search term. It is not necessary to use wildcards here.
- ◆ Click **[OK]** or press **[Enter]**.



## Filtering a PivotTable, continued

### Adding Criteria to an Existing Filter

- ◆ Click on the **[Filter]** button in the 'Filter Area' of the PivotTable (not in the PivotTable Fields).
- ◆ Type in the your search criteria. All matching items will be added to the bottom of the list.
- ◆ Click **[OK]** or press **[Enter]**. Your PivotTable is now displaying only those items that matched your search criteria.
- ◆ To add another search criteria, click on the desired **[Filter]** button again.
- ◆ Type in the next search criteria.
- ◆ Click on the **[Add current selection to filter]** checkbox to turn it on and make sure the *Select Multiple Items* is checked.



- ◆ Click **[OK]**.

The additional search results will be added to the existing results.

## Filtering a PivotTable, continued

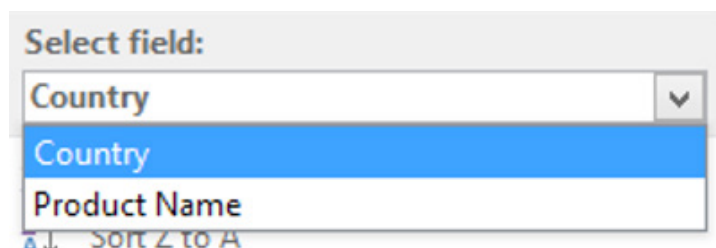
### Using Multiple Row Filters

Sometimes, you will want to filter by multiple fields within your rows. By adding multiple fields to the **Rows** section of your **PivotTable Field List**, you will be able to apply multiple filters at the same time.

#### Note

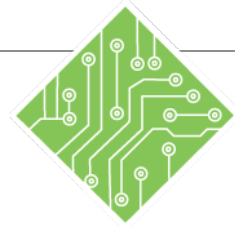
If you are have chosen, PivotTable Options, Display, and checked *Classic PivotTable layout* (enables dragging of fields in the grid), you simply choose which filter you want for each Row that is displayed. There is no **Select field:** choice when you click the **[Filter]** button.

- ◆ Drag a second or third field to the **Row** area in the **PivotTable Field List Task Pane**.
- ◆ Click on the **[Filter]** button next to **Row Labels** in the **PivotTable**.
- ◆ Click on the drop-down arrow next to the *Select field:* text box.



- ◆ Select the field on which you want to filter.
- ◆ Select the appropriate filter options.
- ◆ To apply the second filter, click on the **[Filter]** button again and click on the drop-down arrow next to the *Select field:* text box and choose the field on which you would like to apply the second filter.
- ◆ Repeat these steps as many times as needed.

## Action 2.4 - Multiple Report Filters



### Instructions:

1. You should still have **MyPivotTable.xlsx** open.
2. Drag **Company Name** and **Required Date** to the **Filters** area of the **PivotTable Field List Task Pane**.
3. Click the **Filter** button next to **Country**.
4. Select **Ireland**.
5. Click **[OK]**.
6. Click the **Filter** button next to **Required Date**.
7. Select the checkbox next to **Select Multiple Items**.
8. De-select the **All** checkbox.
9. Click the checkboxes for  
**27-APR-2007**  
**22-MAY-2007**
10. Click **[OK]**.
11. Click the **Filter** button next to **Company Name**.
12. Select **Hungry Owl All-Night Grocers**.
13. Click **[OK]**.
14. Clear the filters for all of the fields.

### Results/ Comments:

If not, open it from the **Student Data** folder.

This will add **Company Name** and **Required Date** to the top of the **PivotTable**.

Now you will only see **Prices** for products sold to Irish companies.

The **PivotTable** now shows only those items sold to Irish companies where the **Required Date** is one of the checkmarked dates.

The **PivotTable** should show only those **Products** sold to the Irish company named **Hungry Owl All-Night Grocers** and the **Salesperson** assigned to that company.

## Action 2.5 - Using the Search Box



### Instructions:

1. Click on the **Filter** button for the **Country** field in the **PivotTable**.
2. Click into the **Search** text box and type **land**.
3. Click the **Select Multiple Items** checkbox.
4. Make sure the **(Select All Search Results)** checkbox is selected.
5. Click **[OK]**.
6. Click on the **Filter** button for the **Country** field in the **PivotTable Report Filter**.
7. Click into the **Search** text box and type **ar**.
8. Click the checkbox to **Add current selection to filter**.
9. Click **[OK]**.
10. Save the file.

### Results/ Comments:

Notice the results shown in the **Filter** box.

Notice **Denmark** and **Argentina** appear in the results.

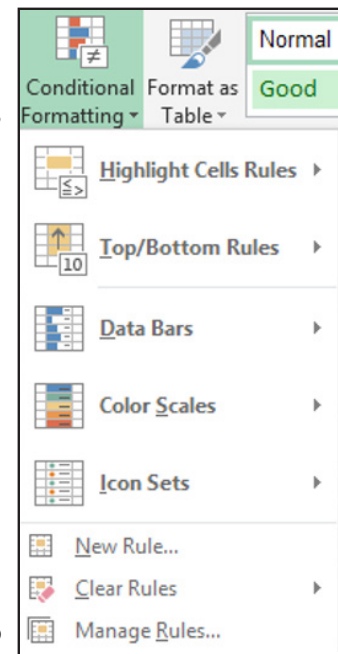
The PivotTable is updated to show only those products sold to companies in **Argentina, Denmark, Finland, Ireland, Poland** and **Switzerland**.

## Conditional Formatting in a PivotTable

Just like in a spreadsheet, you can apply different formatting to your **PivotTable** data based on the values the data assumes at any give time. This is called **conditional formatting**. It is a great way to emphasize data of particular interest. For example you can highlight in red any budget items that are greater than 20% over budget. The technique to apply **Conditional Formatting** is similar to the technique used in a spreadsheet.

### Using Conditional Formatting

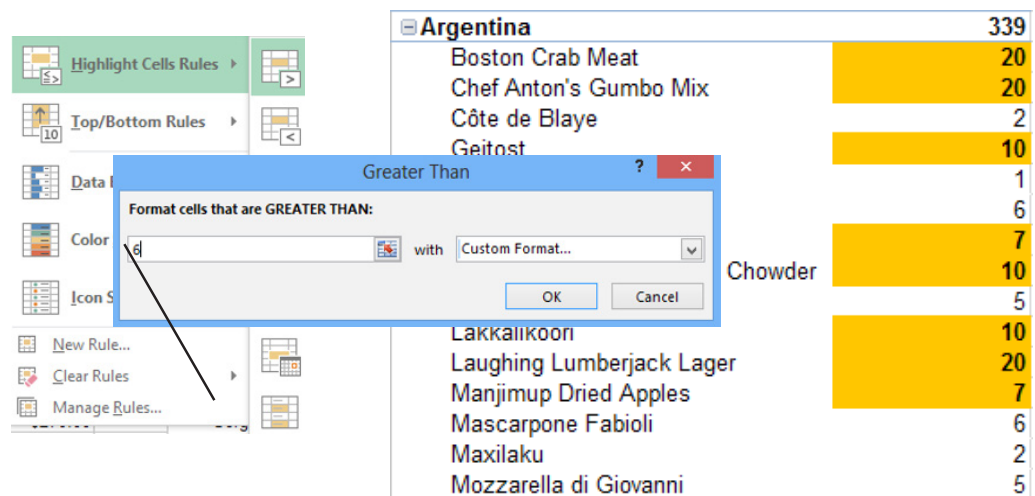
- ◆ Select a value within the field to which you want the formatting applied.
- ◆ Click on the [**Conditional Formatting**] button located on the *Home Tab*. A menu of conditional formatting options will be displayed.
- ◆ Choose one of the following:
  - ◆ **Highlight Cells Rules** — will highlight cells that are greater than, less than, between or equal to values that you specify.
  - ◆ **Top/Bottom Rules** — will allow you to highlight the highest or lowest numbers or percent in the selected cells.
  - ◆ **Data Bars** — will display colored bars that compare the value in the cell to the other cells in the range.
  - ◆ **Color Scales** — will use different shades of color to represent different values from low to high.
  - ◆ **Icon Sets** — will use sets of similar icons that will visually indicate a cell's value relative to a set threshold.



There are also options for creating a new rule, for clearing rules, and for managing rules.

## Conditional Formatting in a PivotTable, continued

- When you select a menu option, a submenu will appear with additional selections. For the **Highlight Cells Rules and Top/Bottom Rules** you will get an additional dialog box to enter a value and color choice.
- As you point to an option in the submenu, you will see a preview of the conditional formatting applied to the selected cell. For the **Highlight Cells and Top/Bottom Rules** options, you will not see the preview until you have selected the specific rule or submenu.
- To implement the conditional formatting, just click the submenu option of your choice. Shown below is an example of **Highlight Cells Rules**.



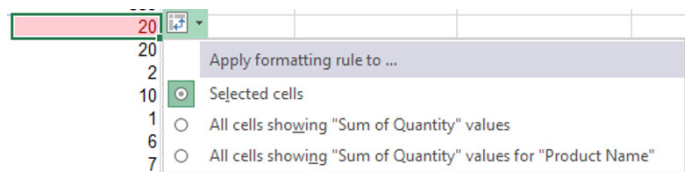
Highlight Cells Rules submenu

Highlight Cells Greater than 98%

### Note

Selecting the second option from the **Smart Tag** list will let you switch **Row** labels if needed because the formatting is applied to the values, not the field.

- Click on the down arrow on the **Smart Tag** to apply the conditional formatting to all of the items in the field.

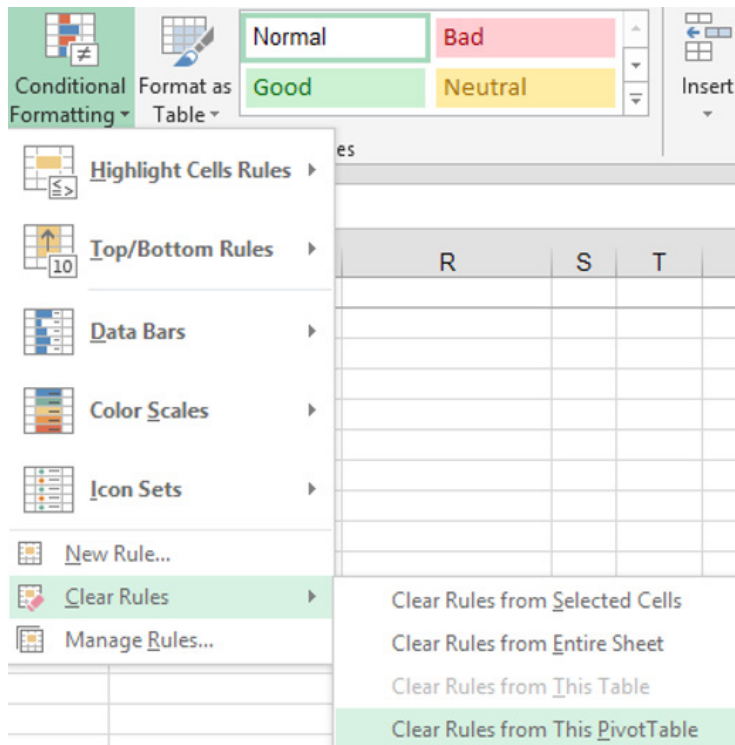


- You can apply multiple conditional formatting rules to a group of cells by simply re-selecting the group and adding another conditional format.

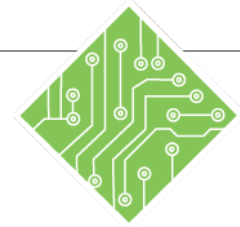
# Conditional Formatting, continued

## Clearing Conditional Formats

- ◆ To clear the formatting, select a cell within the field.
- ◆ Click on the [Conditional Formatting] button.
- ◆ Select **Clear Rules** from the menu.
- ◆ Then, select **Clear Rules from This PivotTable** from the submenu.



## Action 2.6 - Applying Conditional Formatting to a PivotTable



### Instructions:

1. Clear the filters in the **PivotTable**.
2. Select cell **B7**.
3. On the *Home Tab*, in the **Styles** group, click on the [**Conditional Formatting**] button.
4. Trace to **Highlight Cells Rules**, and then select **Greater Than...** from the submenu.
5. Type **3000** in the text box and click [**OK**].
6. Click on the **Smart Tag** that appears next to cell **B7**.
7. Select the third option button.
8. Re-select cell **B7** if necessary.
9. On the *Home Tab*, in the **Styles** group, click on the [**Conditional Formatting**] button.
10. Trace to **Icon Sets**, and then select the first set of directional icons with the arrows from the submenu.
11. Click on the **Smart Tag** that appears next to cell **B7**.

### Results/ Comments:

This indicates that we want to highlight any cells showing numbers greater than 3000.

All cells showing “**Sum of Extended Price**” values for “**Salesperson**” and “**Product Name**”. This option highlights the data and excludes the **Grand Total**.

Next, you want to show values less than **\$500** with a red down arrow.

Don't skip this step. The **Smart Tag** may not appear later and you will have to edit the rule to include the range of data.

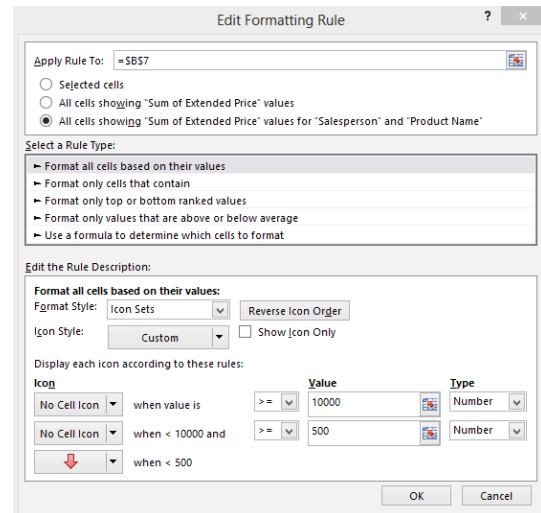
## Action 2.6 - Applying Conditional Formatting to a PivotTable, continued



### Instructions:

12. Select the third option button.
13. Click the **[Conditional Formatting]** button again, then select **Manage Rules...**
14. Click on the **Icon Set** rule, then on the **[Edit Rule...]** button.
15. Change *Type* to **Number** for both of the top icons.
16. For the first Icon, in the *when value is* >= text box, type: **10000**.
17. For the second Icon, in the *when value is* >= text box, type: **500**.
18. Change *Icon* to **No Cell Icon** using the drop-down arrows for the top two items.
19. Click **[OK]**
20. Click **[OK]** again.

### Results/ Comments:



This will only show red icons when <500.

Notice that Anne Dodsworth's data for Alice Mutton is less than \$3,000, so the figure is not shaded in light red and does not have red text.

Notice also, that Laura Callahan's total for Alice Mutton is greater than \$500, but less than \$3,000, so it is not shaded in light red and does not have red text.

Neither figure has a red down arrow.

Notice that several Salespersons have Red Arrows for selling less than \$500.00 or the product Aniseed Syrup.



**Instructions:**

21. On the **Invoices** sheet, change the following cells:

Cell location	Original Value	New Value
J173	16	160
J2115	20	2
J1013	15	1
J394	35	3

22. On **Sheet1**, click on the **PivotTable**.

23. On the **Analyze Tab**, click on the **[Refresh]** button.

24. Save the file.

**Results/ Comments:**

Use the **Name Box** to quickly go to the cell locations.

Notice the formatting changes in cells **B8** and **B10** of the **PivotTable**.

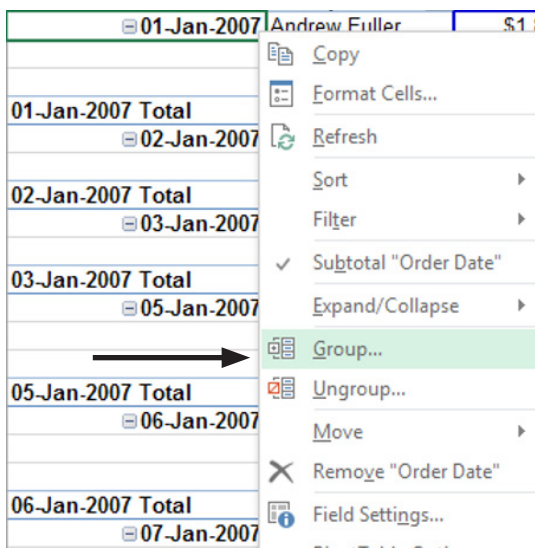
## Grouping Data in a PivotTable

When your **PivotTable** data is in its smallest value, you frequently end up with detailed information that would be better represented by being grouped. For example, if one of the fields in your data table is **Date**, you can group these dates by **Month**, **Quarter**, or **Year**.

### Grouping Data in a PivotTable

- ◆ Select the fields in your **PivotTable**. Use your **[Ctrl]** or **[Shift]** keys to select multiple fields.
- ◆ Right-click on the field and choose **Group** from the shortcut menu.

**Note**  
Right-clicking on any value in a field will reveal a shortcut menu with options to **Group** and **Filter**.



	A	B	C
1			
2			
3	Sum of Extended Price		
4	Order Date	Salesperson	Total
5	01-Jan	Andrew Fuller	\$7,844
6		Anne Dodsworth	\$6,836
7		Janet Leverling	\$35,311
8		Laura Callahan	\$18,794
9		Margaret Peacock	\$46,649
10		Michael Suyama	\$3,476
11		Nancy Davolio	\$16,044
12		Robert King	\$20,313
13		Steven Buchanan	\$12,281
14	Jan Total		\$167,548
15	02-Feb	Andrew Fuller	\$27,641
16		Anne Dodsworth	\$19,326
17		Janet Leverling	\$32,122
18		Laura Callahan	\$7,870
19		Margaret Peacock	\$24,855
20		Michael Suyama	\$3,305
21		Nancy Davolio	\$14,092
22		Robert King	\$11,522
23		Steven Buchanan	\$5,872
24	Feb Total		\$146,604
25	03-Mar	Andrew Fuller	\$17,256
26		Anne Dodsworth	\$9,337
27		Janet Leverling	\$29,364
28		Laura Callahan	\$25,692
29		Margaret Peacock	\$14,480
30		Michael Suyama	\$6,464
31		Nancy Davolio	\$30,341
32		Robert King	\$10,998
33		Steven Buchanan	\$5,279
34	Mar Total		\$149,212

PivotTable with Grouped Date Field

	A	B	C
1			
2			
3	Sum of Extended Price		
4	Order Date	Salesperson	Total
5	01-Jan-2007	Andrew Fuller	\$1,847
6		Nancy Davolio	\$6,932
7		Robert King	\$140
8	01-Jan-2007 Total		\$8,919
9	02-Jan-2007	Laura Callahan	\$3,566
10		Steven Buchanan	\$1,852
11	02-Jan-2007 Total		\$5,418
12	03-Jan-2007	Andrew Fuller	\$1,675
13		Margaret Peacock	\$1,006
14	03-Jan-2007 Total		\$2,681
15	05-Jan-2007	Andrew Fuller	\$40
16		Janet Leverling	\$2,070
17		Nancy Davolio	\$648
18	05-Jan-2007 Total		\$2,758
19	06-Jan-2007	Janet Leverling	\$11,491
20		Margaret Peacock	\$8,891
21		Nancy Davolio	\$400
22	06-Jan-2007 Total		\$20,782
23	07-Jan-2007	Andrew Fuller	\$1,671
24		Janet Leverling	\$1,140
25		Robert King	\$2,851
26	07-Jan-2007 Total		\$5,662
27	08-Jan-2007	Laura Callahan	\$1,622
28		Michael Suyama	\$238
29		Nancy Davolio	\$678
30	08-Jan-2007 Total		\$2,538
31	09-Jan-2007	Janet Leverling	\$319
32		Laura Callahan	\$251
33		Nancy Davolio	\$1,031
34		Steven Buchanan	\$3,108
35	09-Jan-2007 Total		\$4,708

PivotTable with Ungrouped Date Field

## Action 2.7 - Grouping Data in a PivotTable



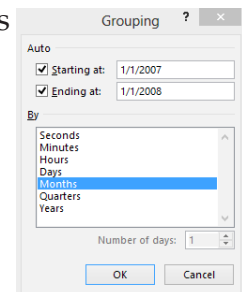
### Instructions:

1. You should still have your **PivotTable** active.
2. Move **Salesperson** to the **Columns** area in the **PivotTable Field List Task Pane**.
3. Move **Shipped Date** to the **Rows** area in the **PivotTable Field List Task Pane**.
4. Make sure **Country** is still in the **Filters** area of the **PivotTable Field List Task Pane**.
5. Drag **Extended Price** out of the **Values** area and replace it with **Unit Price**.
7. Click on the **Shipped Date** field in the **PivotTable**.
8. On the **PivotTable Tools Analyze Tab**, in the **Group** group, click on the **[Group Selection]** button. (You can also *Right-Click* on the **Shipped Date** field in the PivotTable.)
9. **Months** is selected in the **Grouping** dialog box.
10. Click **[OK]**.

### Results/ Comments:

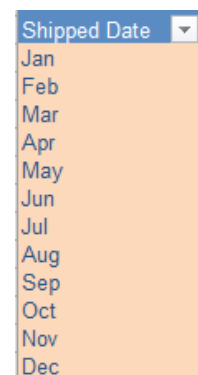
If not, select your **PivotTable**.

The **Grouping** dialog box is opened.



Do not click on **Months**. Clicking on **Months** will de-select it.

The row headings in the PivotTable are now grouped by month.

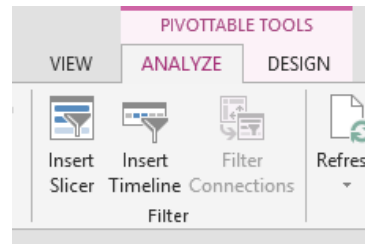


## Using the Slicer

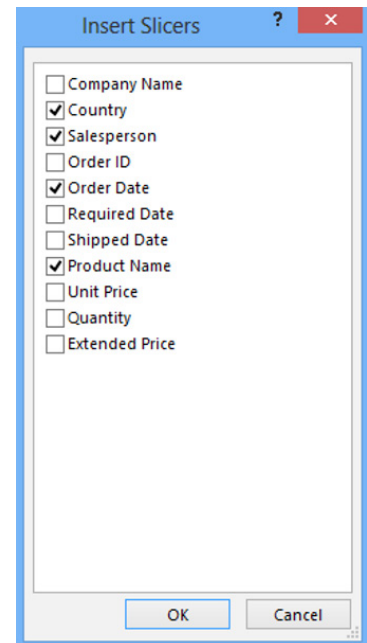
**Slicers** enable you to depict the datasheet fields more comprehensively. The real benefit of **Slicers** can be seen on a **Dashboard** with **PivotTables** and **PivotCharts**. Although **PivotTables** allow you to filter the datasheet, a **Slicer** allows you to compare and evaluate the data from different perspectives quickly, easily and visually. This section will explain how you can use **Slicers** with **PivotTables** and **PivotCharts**.

### Generating Slicers

- ◆ Open your document that contains a datasheet and create a **PivotTable**.
- ◆ Click a cell within the **PivotTable**.
- ◆ Navigate to the *Analyze Tab*.



- ◆ Click the **[Insert Slicer]** button in the **Filter** group.
- ◆ The *Insert Slicers* dialog box will be displayed, containing the fields from the **PivotTable**.
- ◆ Select the Fields from the list that you want to display or manipulate in your **PivotTable**.
- ◆ Click **[OK]**.



You will see a **Slicer** box containing each field you checked. The *Slicer Tools Options Tab* will also be available on the ribbon. This tab will allow you to change the title, format, size and position of the **Slicers**.

## Using the Slicer continued

### Note

To make multiple selections, hold down your [Ctrl] key while clicking on the field.

## Using Slicers

To display information that pertains only to a specific item or combination of items, click on that option in one of the available **Slicers**. The **PivotTable** will automatically show only the information related to the selected item(s). If you have a **PivotChart** created based on the same **PivotTable**, the **PivotChart** will also display the selection(s).

By using **Slicers**, you can filter down your data into more detail. **Its real usage can be seen when you are dealing with large data sheets.**

Country	Order Date
Argentina	01-Jan-2007
Austria	02-Jan-2007
Belgium	03-Jan-2007
Brazil	05-Jan-2007
Canada	06-Jan-2007
Denmark	07-Jan-2007
Finland	08-Jan-2007
France	09-Jan-2007

Salesperson	Product Name
Andrew Fuller	Alice Mutton
Anne Dodsworth	Aniseed Syrup
Janet Leverling	Boston Crab Meat
Laura Callahan	Camembert Pierrot
Margaret Peacock	Carnarvon Tigers
Michael Suyama	Chai
Nancy Davolio	Chang
Robert King	Chateau Champagne

## Using a Filter Versus Using a Slicer

Is it better to use a **Filter** or a **Slicer**? Prior to 2010, **Slicers** were not available for use in a **PivotTable**. Slicers make it easier to *see* the current filtering state when you filter on multiple items. This makes it easy to understand what is exactly being shown in a filtered **PivotTable**. Additionally, **Slicers** have some additional functionality, like the ability to use one **Slicer** for multiple tables. This is explored further in the Excel Dashboard class.

## Clearing a Slicer Filter

- Click on the **[Clear Filter]**  button in the top right corner of the **Slicer**.

## Closing or Deleting a Slicer

- Click on the **Slicer** to select it.
- Press the **[Delete]** key.
- OR -
- Right-click on the **Slicer**.
- Select **Remove <Slicer Name>** from the shortcut list.

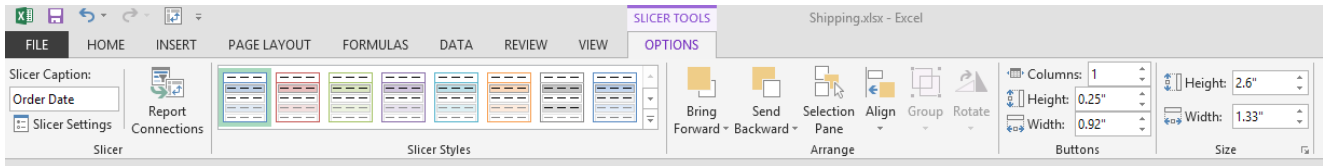
### Note

To select all of the **Slicers**, select one of them and press **[Ctrl + A]**.

# Formatting a Slicer

## Using the Ribbon

- ◆ Select the **Slicer** you would like to format.
- ◆ When the *Slicer Tools Options Tab* appears, use the tools to change the appearance of the **Slicer**.



- ◆ In the **Slicer** group, you can change the **Slicer Caption**, or click on the **[Slicer Settings]** button to open the dialog box. You can also connect one **Slicer** to multiple **PivotTables** using the **[Report Connections]** button.
- ◆ Choose a **Slicer** style from the **Slicer Styles Gallery** by selecting an option from the gallery.

Use the **[More]** button  to expand the gallery and view all of the styles. Notice, the **Live Preview** option does not work in this gallery.

- ◆ The **Arrange** group contains tools to layer the **Slicers** and objects on your spreadsheet, as well as to align the **Slicers**.
- ◆ The **Buttons** group allows you to set the size of the buttons in the **Slicer** and how the buttons are displayed.
- ◆ The **Size** group allows you to change the size of the **Slicer frame**. The height and width can be changed using the spin buttons in the **Height:** and **Width:** text boxes on the **Ribbon**, or by using the sizing handles on the **Slicer** itself.

By changing the number of columns, as well as the height and width of the **Slicer**, you can position the **Slicer** in a smaller space.

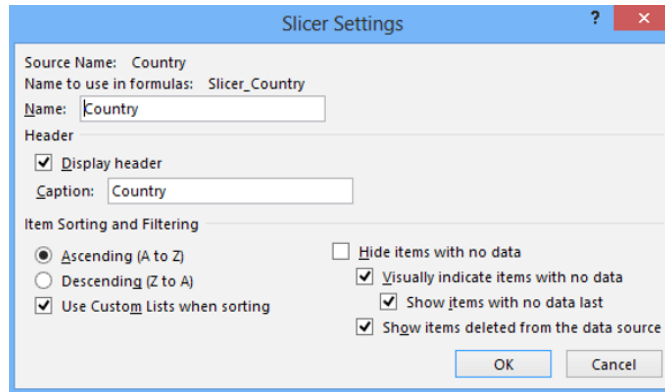
See Appendix A for additional **Slicer** formatting options.

**Note**  
Be careful when changing the height and width of the **Slicer** buttons. Use the **Height** and **Width** settings in the **Button** group.

## Formatting a Slicer, continued

### Using the Slicer Settings Dialog Box

The following options are available in the *Slicer Settings* dialog box which you can display by clicking the **[Slicer Settings]** button or right-clicking on the **Title Bar** for the *Slicer* you want to change.



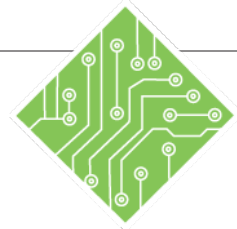
#### Note

**Show items with no data last** cascades underneath **Visually indicate items with no data** because it is dependent on whether **Visually indicate items with no data** is checked or not.

- ◆ *Name*: This is to identify the object on the spreadsheet. The default name is usually displayed, but can be changed to a more appropriate title.
- ◆ The **Display Header** checkbox will turn the Header on the **Slicer** off and on. You may wish to turn the header off when it is unnecessary or you are trying to fit the **Slicer** into a small area.
- ◆ The *Item Sorting and Filtering* section is to determine how you wish the values in the **Slicers** to appear.
- ◆ **Visually indicate items with no data** means that even if there is no data, the button for that category/item will still appear in the **Slicer**. You may see this when you connect your **Slicer** to multiple **PivotTables**. The button will simply be grayed out if there is no data associated with it.
- ◆ **Show items with no data last**, will put that button at the bottom of the **Slicer**. The buttons will be rearranged to show those with data first, going from left-to-right, top-to-bottom.
- ◆ Similarly, **Show items deleted from the data source** will still show a button in the **Slicer** for items that have been deleted, as long as items deleted from the data source are being retained in the *PivotTable Options*.

For additional information on **PivotTables** and **Slicers**, try the Excel Dashboard class.

## Action 2.8 - Using and Formatting the Slicer



### Instructions:

1. You should still have **MyPivotTable.xlsx** open.
2. On **Sheet1**, click into the **PivotTable** to select it.
3. Remove **Product Name** from the **Columns** area.
4. Drag another instance of the **Unit Price** field into the **Values** area of the **Field List Task Pane**.
5. Click the drop-down arrow of one of the two instances of **Unit Price** in the **Field List Task Pane** and choose **Value Field Settings**
6. Choose **Average** from the *Summarize value field by list*.
7. Click the **[Number Format]** button.
8. Select **Accounting** from the index on the left.
9. Change the number of *Decimal places*: to **0**.
10. Click **[OK]**.
11. Click **[OK]** again.
12. On the **Analyze Tab**, click the **[Insert Slicer]** button.

### Results/ Comments:

If not, open it.

This adds a second instance of the same field so that you are able to calculate using a different function.

This opens the *Field Settings* dialog box.

The *Insert Slicer* dialog box opens.

## Action 2.8 - Using and Formatting the Slicer, continued



### Instructions:

13. Place check marks next to **Company Name**, **Country**, and **Product Name**.
14. Click **[OK]**. Move the Slicers below the PivotTable.
15. Select the **Product Name Slicer**.
16. Select **Slicer Style Dark 6** (the last option) from the **Slicer Styles Gallery** on the **Slicer Tools Options Tab**.
17. Pass your mouse pointer over the different values in the **Product Name Slicer** and notice the format change of the buttons passed over.
18. Make sure the *Product Name Slicer* is selected. Click Aniseed Syrup in the **Slicer** to filter the data. Notice the Values change in the PivotTable.
19. Select the **Company Name Slicer**. Right click and choose **Slicer Settings....**
20. Click the **Descending** option button to sort the values on the **Slicer** in descending order.
21. Click **[OK]**.
22. Save your file.

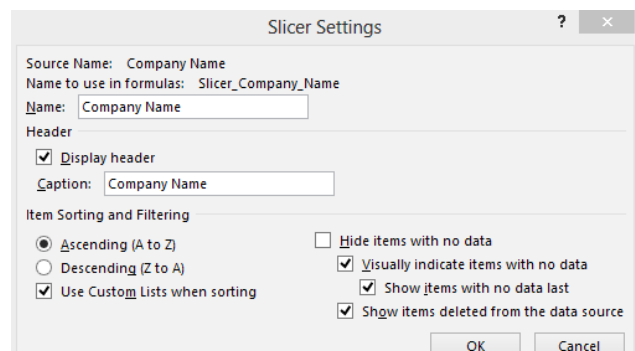
### Results/ Comments:

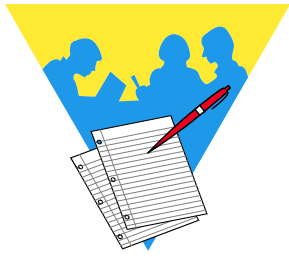
To choose the fields to 'slice'.

A *Slicer* window for each field is opened on the sheet with the **PivotTable**. Notice you can open **Slicers** for fields that do not appear on the **PivotTable**.

Notice the new contextual tool tab.

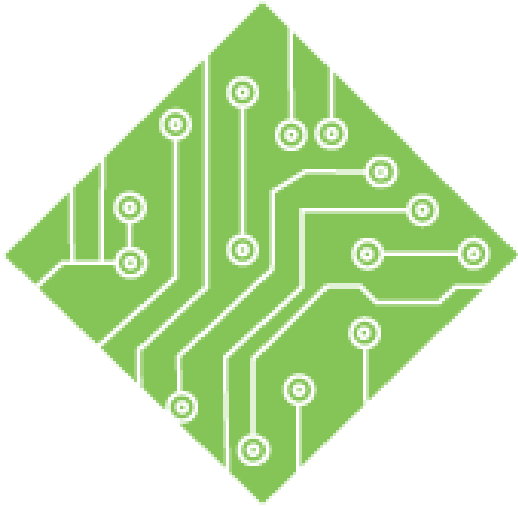
Use the **[Ctrl]** key to select multiple values in each **Slicer**.





## Tips and Notes



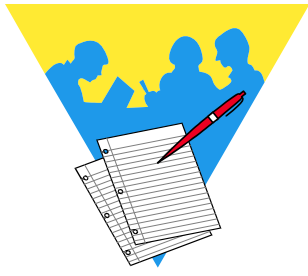


## Lesson 3: Creating and Modifying PivotCharts

### Lesson Overview

You will cover the following concepts in this chapter:

- ◆ Creating PivotCharts
- ◆ Modifying PivotCharts
- ◆ Using the Slicer with the PivotChart



## Lesson Notes



## PivotCharts

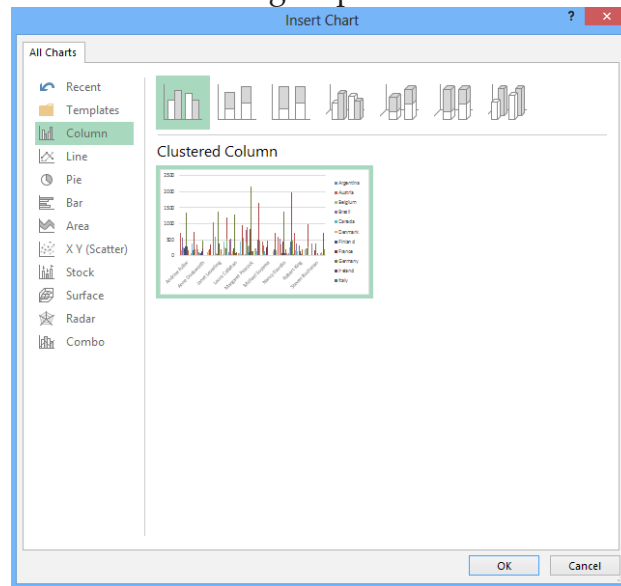
In Excel you can create a **PivotChart** from scratch, or create a **PivotChart** based on an existing **PivotTable**.

### Note

When you create a **PivotChart** from scratch, a corresponding **PivotTable** is automatically generated.

### Creating a Chart Based on an Existing PivotTable

- ◆ Select a cell in the **PivotTable**. The *PivotTable Tools Tab* is displayed.
- ◆ With the *Analyze Tab* active, click the **[PivotChart]** button in the **Tools** group.

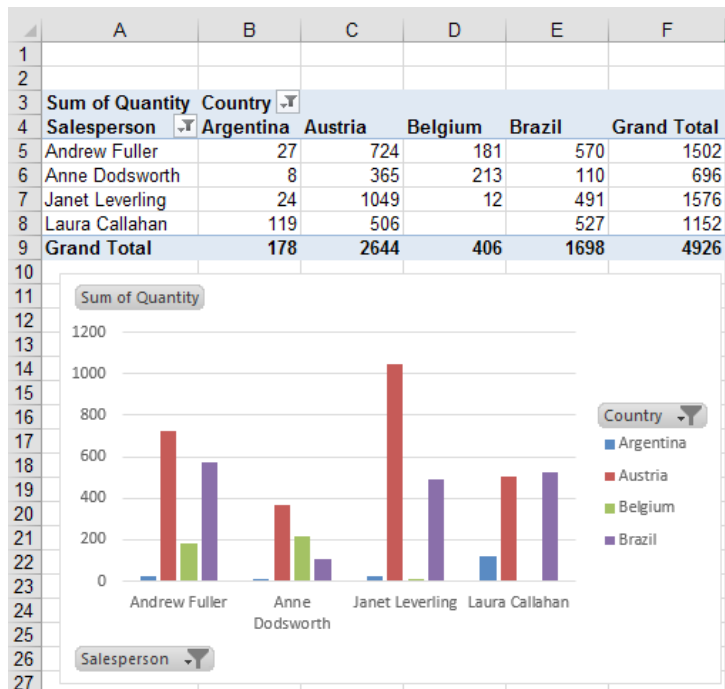


- ◆ Choose the type of chart most suited to your data and click **[OK]**.

Notice the addition of the *PivotChart Tools Tabs*.



## PivotCharts, continued



In the image above, a basic column chart has been created from an existing **PivotTable**. This particular chart shows quantities sold by salespersons broken down over countries.

Any changes made to the source data or rearrangement of field values in the **PivotTable** will be automatically reflected in the **PivotChart**. Refreshing will update both the **PivotTable** and the **PivotChart**. This makes the **PivotChart** every bit as malleable as the **PivotTable** upon which it is based.

### Changing the Chart Style

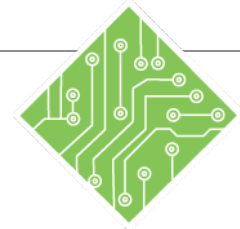
If you don't like the chart type chosen, you can select any other chart type from the *Change Chart Type* dialog box *except* XY (Scatter), Bubble, or Stock charts to display the data in a **PivotTable**.

- ◆ Click on the **PivotChart**.
- ◆ Make sure the *PivotChart Tools Tab* is displayed and click the *Design Tab*.
- ◆ Click the [**Change Chart Type**] button in the **Type** group.
- ◆ Choose the chart type you want and click [**OK**].

Keep in mind that not all chart types are equally suited for displaying your **PivotTable** data. Pick the chart type that most clearly illustrates the point you want to communicate.



## Action 3.1 - Creating a PivotChart



### Instructions:

1. You should still have **MyPivotTable.xlsx** open.
2. Click on the **Invoices** sheet.
3. Click anywhere in the data on the **Invoices** sheet.
4. Select the **Insert Tab** and click the **[PivotTable]** button.
5. Verify that **Select a table or range** option button is chosen and the correct range is entered in the **Table/Range** field.
6. Make sure that the **New Worksheet** option button is selected.
7. Click the **[OK]** button to create the **PivotTable**.
8. Place **Shipped Date** in the **Filters**, **Salesperson** in the **Columns**, **Country** in the **Rows**, and **Quantity** in the **Values** field.
9. On the **Analyze Tab** click the **[PivotChart]** button.
10. Choose the **Clustered Column type** and click **[OK]**.
11. Notice the **PivotChart Tools** tabs added to the **Ribbon**.

### Results/ Comments:

If not, open it from the **Student Data** folder.

You will create a new **PivotTable** first.

Invoices!\$A\$1:\$K\$2156

The *Insert Chart* dialog box opens.

A chart is added to the same sheet as the **PivotTable** sheet.

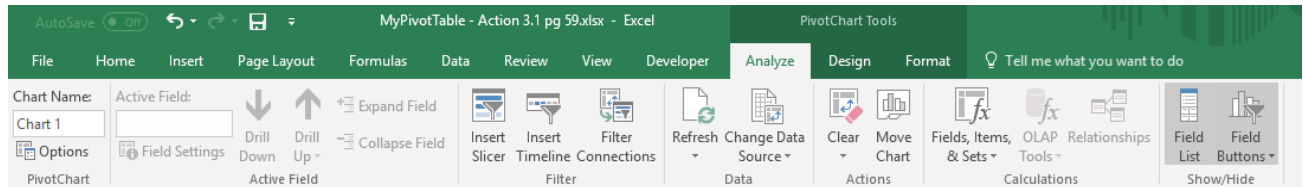
Three new tabs are added: *Analyze, Design, and Format*.



# Formatting PivotCharts

When you click into the PivotChart you have created, you will notice that several contextual tabs appear: The *Analyze*, *Design*, and *Format* ribbons.

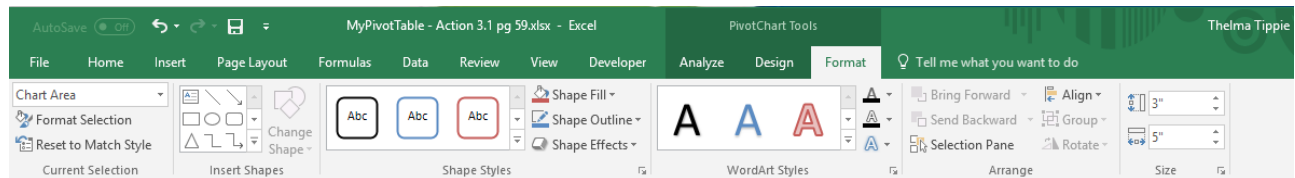
## The Analyze Ribbon



**Note**  
The [Insert Slicer] button is only available when the PivotChart and PivotTable are in the same worksheet.

The *Analyze Tab*, contains many of the tools that you need to affect the data that is actually displayed on your **PivotChart**. For example, you can use this **Ribbon** to insert a **Slicer** connected to your **PivotChart**. In the **Active Field** group, you can expand and collapse fields you have selected on the **PivotChart**.

## The Format Ribbon



This **Ribbon** is used to change the appearance of any of the elements in the **PivotChart**.

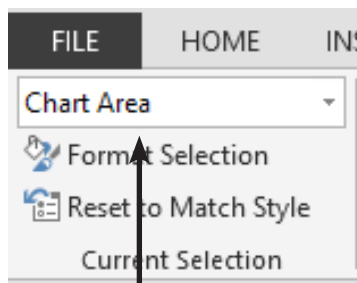


Chart Elements box

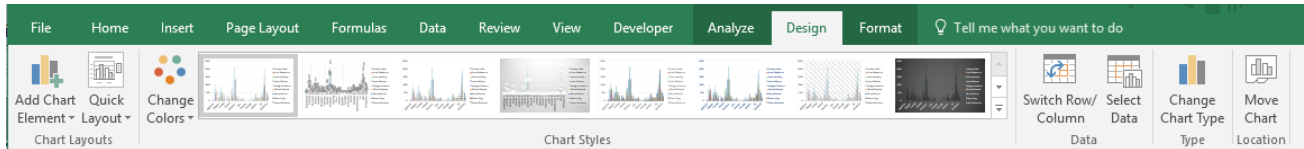
- ❖ Click on the drop-down arrow in the **Chart Elements** box. Select an item from the drop-down list.
- OR -
- ❖ Select the element in the **PivotChart**. Notice the name in the **Chart Elements** box changes to reflect the selection.
- ❖ Use the tools on the **Ribbon** to change the appearance of the selected item.



## Formatting PivotCharts, continued

### The Design Ribbon

This **Ribbon** is for quickly adding chart elements, selecting a chart style, changing the chart type and moving the chart to a different worksheet.



- ◆ The **Chart Layouts Group** lets you add, remove and change these elements of the **PivotChart** by clicking the down arrow on the **[Add Chart Element]** button. Each choice has a sub-menu that also has a 'More...' choice that will display a **Format Panel** for that object. Not this is where you can add a *Trendline* to your **PivotChart**.

This group also has a button for **[Quick Layout]** with pre-determined elements already displayed

- ◆ The **Chart Styles Group** has tools to format the background area of the **PivotChart**. Each chart type, will have it's own set of styles available in the *Styles Gallery*. The **[ChangeColors]** button changes the color of the **Data Series** area.
- ◆ The **Data Group** lets you Switch Rows and Columns in the **PivotChart** and select a specific *Data Source* using the **[Select Data]** button.
- ◆ The **Type Group** is a quick way to change the type of **PivotChart** displayed.
- ◆ The **Location Group** allows you to move the Chart to a New Sheet or as an object in a specified sheet in your workbook.

You can also change and add elements to your **PivotChart** from the following choices on the **Insert Ribbon**.

- ◆ Add pictures & shapes using the **Illustrations Group**;
- ◆ Insert a chart or change the chart type from the **Charts Group**;
- ◆ Add a Slicer or Timeline from the **Filters Group**;
- ◆ Use the **Text Group** to add a Text Box or Header & Footer.

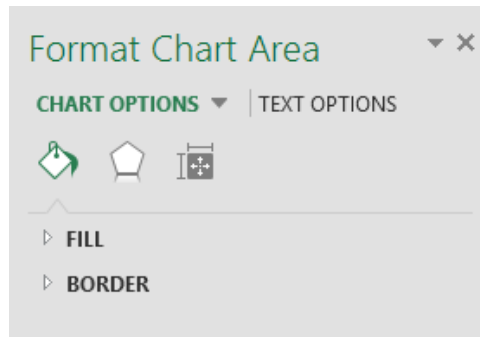


## Formatting PivotCharts, continued

### Using the Format Shape Dialog Box

An alternative to using the tools on the *Format Ribbon* is to use the *Format Task Pane*. To open the Task Pane, click on the **[Format Selection]** button on the *Format Tab* of the **Format Ribbon**. The options in the *Format Selection Task Pane* will change based on the element that is selected in the **PivotChart**. You can use the words at the top, or the icons below those, or the index below the icons to select the different elements you wish to affect.

**Note**  
Clicking into the **PivotChart** and pressing **[Ctrl + 1]** will also open the *Format Selection* dialog box.



*Format Task Pane*

Keep in mind that while this Task Pane is open, other elements in the **PivotChart** can be affected when selected. You may keep the Task Pane open, click on the element you wish to change, and make changes to multiple chart elements before closing the Task Pane.



## Action 3.2 - Modifying a PivotChart



### Instructions:

1. On the *Design Tab*, click the [**Move Chart**] button.
2. Check the **New Sheet** option button and click [**OK**].
3. On the *Design Tab* click the [**Change Chart Type**] button.
4. Choose the first **Bar** chart option and click [**OK**].
5. On the *Design Tab* click the [**Add Chart Element**] button and trace to **Chart Title** and then select *Above Chart*.
6. With the **Chart Title** text box active, type **Sales** and press the [**Enter**] key.
7. On the *Format Tab* choose a WordArt style from the **WordArt Styles gallery**.
8. Right-click the **Chart Title** text box. Choose **Font** on the menu and change the font size to **40 pts**.
9. On the *Analyze Tab*, in the **Show/Hide** group, click the [**Field Buttons**] drop-down arrow.
10. Uncheck all except the **Show Report Filter Field Buttons**.

### Results/ Comments:

Your **PivotChart** is now on a new sheet named **Chart1**.

The *Change Chart Type* dialog box opens.

The new **PivotChart** type replaces the current **PivotChart**.

A chart title text box appears above the chart.

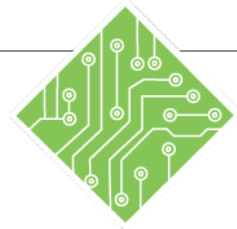
Notice you do not need to click into the **Chart Title** text box. As you type, the title will appear in the **Formula Bar**. It appears in the Chart Title text box when you press [**Enter**].

Make sure the **Chart Title** text box is still selected.

The text is now also big enough to read easily.

This allows you to choose which of the field filter buttons are visible and which fields users can filter by.

You are now able to filter this data only by **Shipped Date**.



**Instructions:**

11. Click on the **Shipped Date** filter button in the **PivotChart** and select **Mar**.
12. Click **[OK]**.
13. Click on the **Shipped Date** filter button again. Select the **Select Multiple Items** checkbox.
14. Select the **Mar** and **Apr** checkboxes.
15. Click **[OK]**.

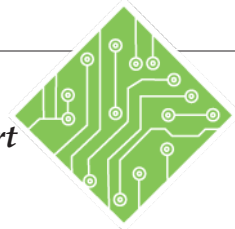
**Results/ Comments:**

Notice how the **PivotChart** changes to reflect only those sales in **March**.

If needed, deselect the **All** checkbox.

Notice again how the chart changes to reflect the new selection.

Notice also that although a **Shipped Date** month has been selected, the month does not appear on the **PivotChart** by default. **Slicers** on the **PivotTable** would alleviate this problem.

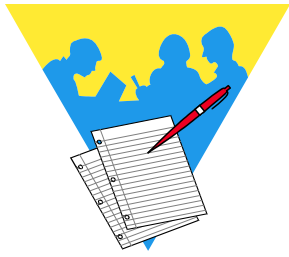


**Instructions:**

1. Click on the **[Move Chart]** button in the *Design Tab*.
2. Select the **Object in:** option button.
3. Use the drop-down arrow to select **Sheet1**.
4. Click **[OK]**.
5. Move the **PivotChart** so that it does not overlap the **PivotTable**.
6. Click into the **PivotChart** on **Sheet1**.
7. Select the **[Insert Slicer]** button from the *Analyze Tab*.
8. Click on the **Product Name** and **Shipped Date** checkboxes.
9. Click **[OK]**.
10. Move the **Slicer** so that it does not overlap the **PivotChart** or the **PivotTable**.
11. Select a **Product** from the **Product Name Slicer** and observe the changes in both the **PivotTable** and the **PivotChart**.
12. Save and close the file.

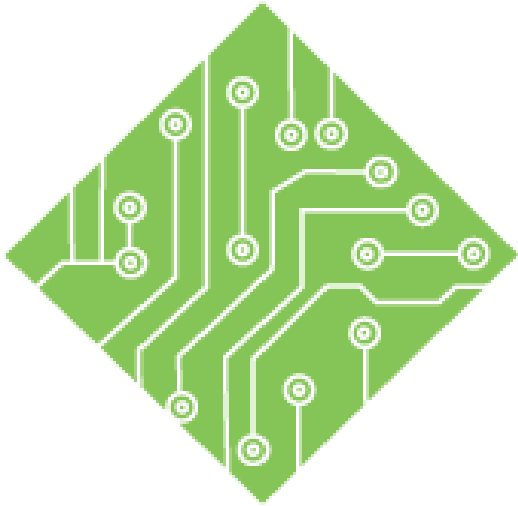
**Results/ Comments:**

Now, we will move the **PivotChart** back to **Sheet1** in order to insert a **Slicer** that will affect both the **PivotTable** and the **PivotChart**.



## Tips and Notes



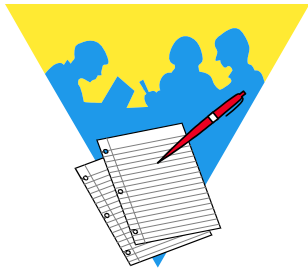


## Lesson 4: Advanced Features of PivotTables

### Lesson Overview

You will cover the following concepts in this chapter:

- ◆ Consolidating Multiple Workbooks, and Ranges
- ◆ Using Page Fields in a PivotTable Report
- ◆ Using Calculated Fields and Calculated Items in a PivotTable Report



## Lesson Notes



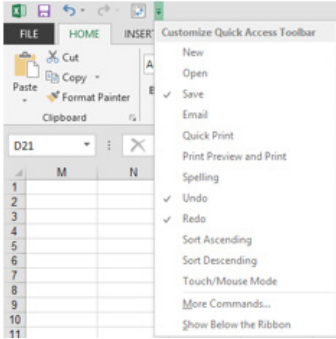
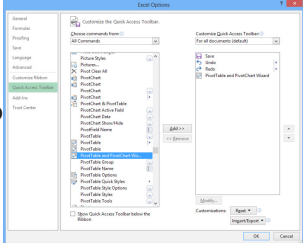

## Consolidating Multiple Workbooks & Ranges

Frequently, the goal of a **PivotTable** is to consolidate information into a format that can be manipulated in various combinations without modifying the original data source.

With a **PivotTable**, we can select different options, filter for specific criteria, and apply conditional parameters to identify trends or to display patterns or relationships that might not otherwise be obvious when reviewing a traditional spreadsheet.

One of the ways that you can consolidate multiple workbooks or data ranges on different worksheets into one **PivotTable** is to utilize the **PivotTable and PivotCharts Wizard**.

### Installing the PivotTable & PivotCharts Wizard

- ◆ On your **Quick Access Toolbar (QAT)**, located at the upper-left corner of your Excel screen, select the **[Customize]** button and select the **More Commands** option.
- 
- ◆ From the *Customize the Quick Access Toolbar* page of the *Excel Options* dialog box, under the *Choose commands from:* drop-down, select **All Commands**.
- 
- ◆ Scroll down and select the **[PivotTable and PivotChart Wizard]** icon, then select **[Add]** to add it to the right-hand column.
  - ◆ Click the **[OK]** button
  - ◆ The **PivotTable and PivotChart Wizard** icon will appear on your QAT and return you back to your Excel worksheet.
- 



## Consolidating Multiple Workbooks & Ranges, continued

Once you have the PivotTable and PivotCharts Wizard installed on the QAT, you need to decide how you are going to consolidate your data from each separate worksheet range into a PivotTable report on a master worksheet. Selected ranges can be in the same workbook as the master worksheet or in a different workbook. When you are consolidating the data, remember that you are assembling this data so you can easily update and aggregate it regularly or as needed.

Your resulting consolidated **PivotTable Report** can have the following fields in the **PivotTable Field List**, which you will add to the **PivotTable Report: Row, Column and Value**. In addition, your report can have up to four page filter fields called **Page1, Page2, Page3, and Page4**.

### Considerations for Setting Up Your Source Data

- ◆ Your data ranges should be set up in a cross-tabular format with matching column names for items that you want to summarize together.
- ◆ You should not include any total rows or total columns from the source data when you are specifying the data range for the report.
- ◆ Consolidations can use **Page Fields** that contain items representing one or more of the data source ranges.

For example, when representing multiple items, such as departments for a budget, a **Page Field** can include one item to show the data for each department, plus an item to show the combined data.

- ◆ Consolidations can use **Named Ranges** which perform better for data that is likely to change the next time you perform a consolidation action on the worksheet or workbook.

This would include changes such as data within the rows or the number of rows that make up the **Named Range**.

- ◆ Consolidations can also use formulas such as a **3D Reference**, or the **[Consolidate]** command located on the *Data Tab* in the **Data Tools** group.



## Consolidating Multiple Workbooks & Ranges, continued

### What Type of Consolidation do I want?

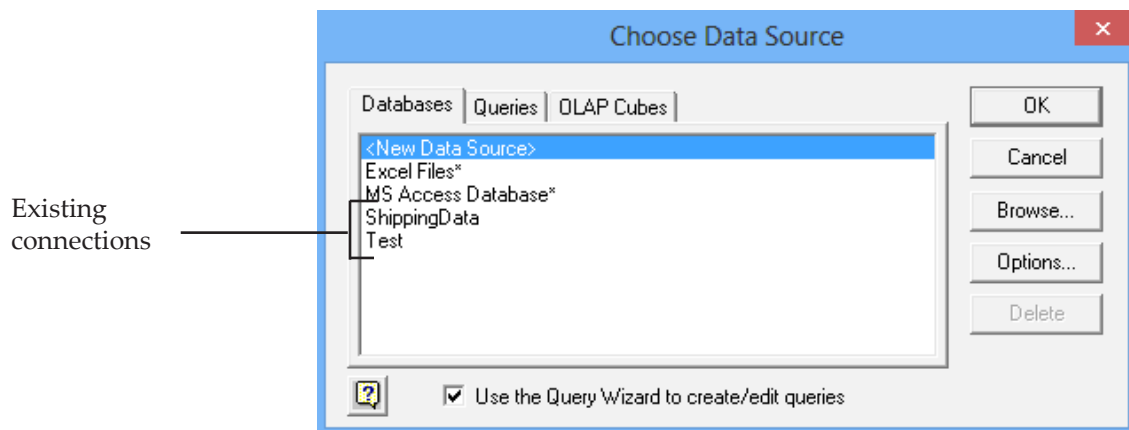
In **Step 1** of the **PivotTable and PivotChart Wizard**, there are several selections to determine the type of consolidation you wish to produce.

#### Microsoft Excel List or Database

Choose this option when the source data is on an Excel spreadsheet. Excel recognizes data that is contiguous, with no row or column separators, as a list or database. So, as long as the data does not have blank rows or columns, Excel can use it for consolidation.

#### External Data Source

Choose this option when the data source is not in the active workbook and is not necessarily Excel data. If the source data is from an Access table or other file type, Excel will develop the consolidation from this data. The following dialog box will display in **Step 2** of the **Wizard** when the **[Get Data...]** button is selected.



This dialog box will also display existing connections that have been created as queries using the *Data Tab*.

#### Multiple Consolidation Ranges

When your source data is Excel data on different spreadsheets or in different files, you should select this option. This will generate the dialog box that allows you to select data from different locations.

#### Another PivotTable Report or PivotChart Report

Select this option if the source data is in an existing **PivotTable Report** or **PivotChart**. This will consolidate data that is generated when the **PivotTable** or **PivotChart** is refreshed.

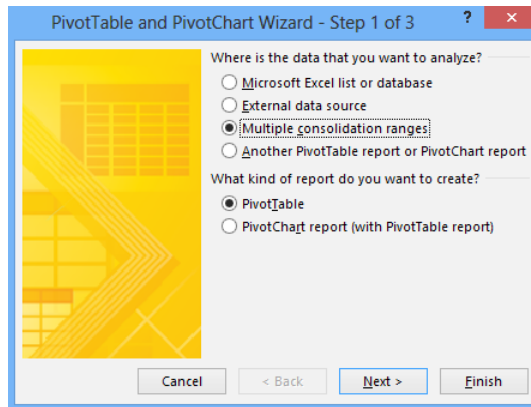


## Consolidating Multiple Workbooks and Ranges, continued

### Consolidating Data Without Using Page Fields

To combine data from all your ranges and create a consolidation that does not contain **Page Fields** do the following:

- ◆ Click in a blank cell that is not currently part of a **PivotTable** Report.
- ◆ Start the **PivotTable and PivotChart Wizard**.
- ◆ On Step 1 of the **PivotTable and PivotChart Wizard**, click **Multiple Consolidation Ranges**, then click **[Next]**.

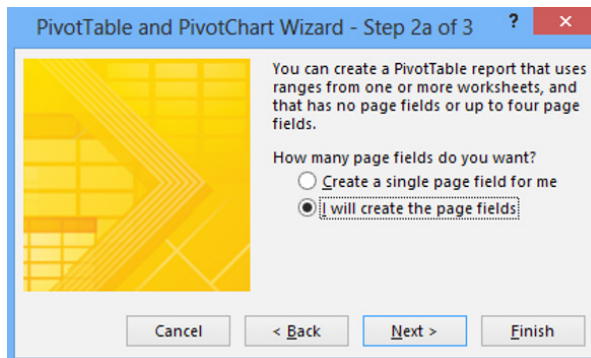


- ◆ On Step 2a of the **PivotTable and PivotChart Wizard**, click **I will create the page fields**, then click **[Next]**.



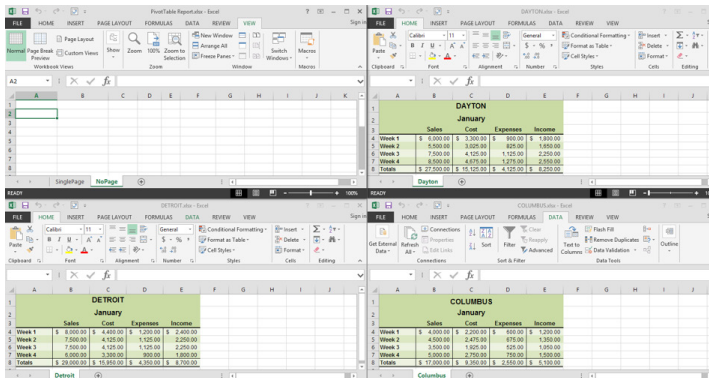
**Note**

If the cell ranges that you want to add are located in other workbooks, open those workbooks first to make accessing the cell range easier.

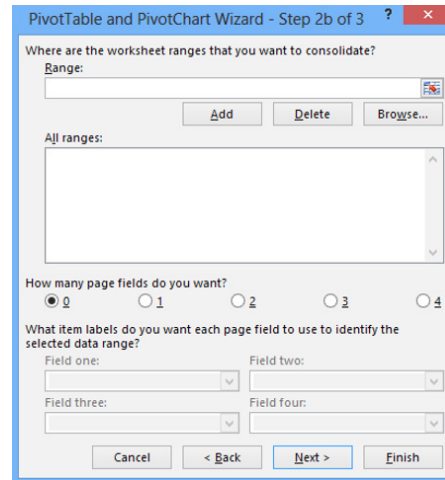


# Consolidating Multiple Workbooks and Ranges, continued

- On Step 2b of the **PivotTable and PivotChart Wizard**, for each range of cells you want to select, click on the **[Collapse Dialog Box]** button, select the cell range on the worksheet, close the **[Selection Tool]**, and then click **[Add]**.

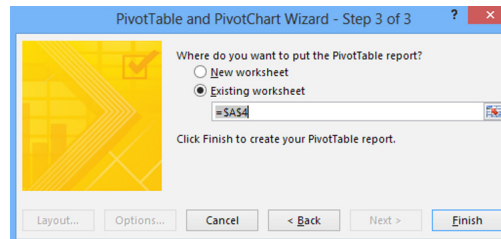


Sheets to be consolidated being viewed in Tiled format.



Collapse Dialog Box button

- Under *How many page fields do you want?*, click **0**, and then click **[Next]**.
- On Step 3 of the **PivotTable and PivotChart Wizard**, select a location for the **PivotTable Report** and then click **[Finish]**.



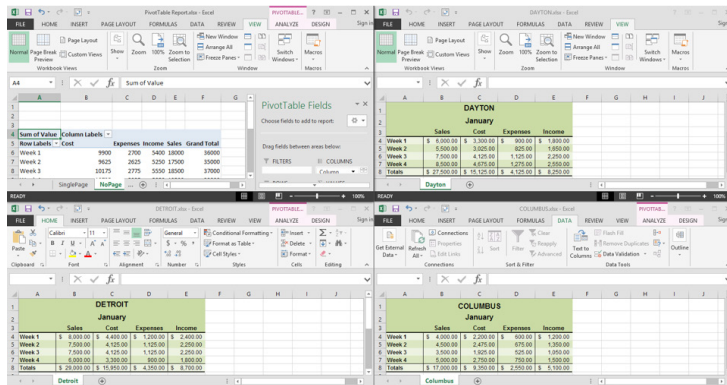
- When the **PivotTable and PivotChart Wizard** closes it will return you to your master worksheet and display the consolidation of the data ranges that you selected.

# Consolidating Multiple Workbooks and Ranges, continued

- ◆ The master worksheet will contain the **PivotTable Report** and display the **PivotTable Field List** on the right-hand side of the worksheet.

Click on the [Maximize] icon on the top of the page to make your new consolidation a full-size window.

Select a cell inside the **PivotTable**, then right-click and select **PivotTable Options** to go to the *Display* tab and check the **Classic PivotTable layout (enables dragging of fields in the grid)** option to turn on the **Classic PivotTable Layout**.



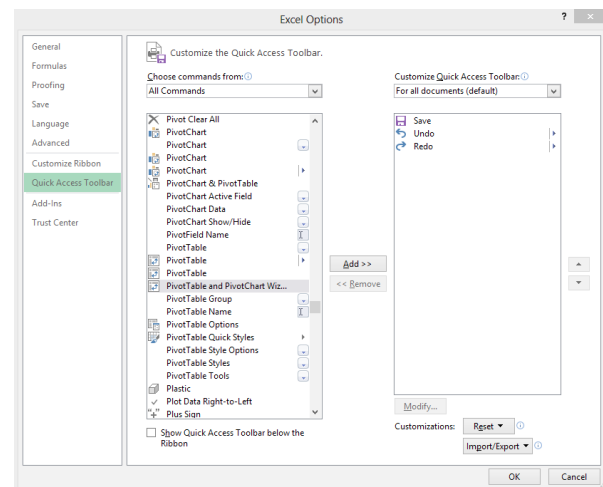
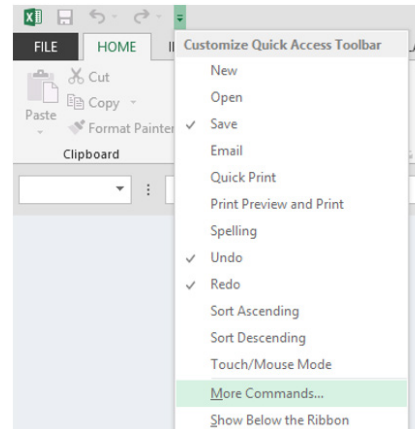
## Action 4.1 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard



### Instructions:

1. On your **Quick Access Toolbar** at the top left of your Excel workbook, click on the **[Customize]** button and select **[More Commands]**.
2. In the *Excel Options* dialog box, under *Choose commands from:*, select the drop-down and select **All Commands**.
3. Scroll down and select the **PivotTable and PivotChart Wizard** icon, then select **[Add]** to add it to the right-hand column.
4. Click the **[OK]** button and the **PivotTable and PivotChart Wizard** icon will appear on your **QAT** and return you to your Excel worksheet.
5. Open the workbooks named **PivotTable Report.xlsx**, **Detroit.xlsx**, **Dayton.xlsx**, and **Columbus.xlsx** from your exercise files folder.
6. From your *View Tab*, select the **[Arrange All]** button in the **Window** group.
7. In the *Arrange Windows* dialog box, select the **Tiled** option button and click **[OK]**.
8. Click on cell **A2** on the **NoPage** sheet in the tile containing the **PivotTableReport.xlsx** workbook.
9. Launch the **PivotTable and PivotChart Wizard** from the **QAT** in the **PivotTable Report.xlsx** workbook.

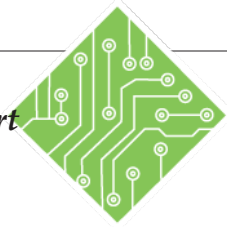
### Results/ Comments:



Your workbooks will now be arranged in a tiled format so you can see all four files at one time.

This is where we are going to put the **PivotTable Report Frame** when we consolidate the data.

## Action 4.1 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard, continued



### Instructions:

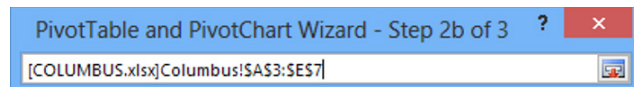
10. In **Step 1** of the *Wizard*, select the **[Multiple consolidation ranges]** option button, then click **[Next]**.
11. For **Step 2a** of the *Wizard*, select the **I will create the page fields** option button, then click **[Next]**.
12. Click into the *Range:* box, then click the **[Columbus.xlsx]** workbook to activate it.
13. Select the range **A3:E7**.
14. In the *PivotTable and PivotChart Wizard* dialog box, under the *Range* box, select **[Add]** to add the selected range from the **Columbus.xlsx** spreadsheet to the *All Ranges* box.
15. Repeat the steps above to Add the same range from the **Dayton.xlsx** and **Detroit.xlsx** workbooks.
16. Once you have all three workbooks added in the *All Ranges* box, select **[0]** option button under *How many page fields do you want?*.
17. Click **[Next]** to continue.
18. On **Step 3** of the *Wizard*, select the **Existing worksheet** option button.
19. Click **[Finish]** to complete the consolidation wizard.

### Results/ Comments:

You are selecting this option because you are using multiple workbooks or worksheets to construct your consolidation.

Selecting this option allows you to control the number of **Page Fields**.

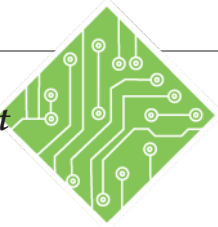
In **Step 2b** of the *Wizard*, you will be selecting the ranges you want to consolidate.



Notice that the range selected is defined as **[Columbus.xlsx]Columbus!\$A\$3:\$E\$7**. These are *absolute cell references* to the **Columbus.xlsx** workbook.

The order in which you select the ranges does not matter since Excel will sort the ranges alphabetically.

## Action 4.1 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard, continued



### Instructions:

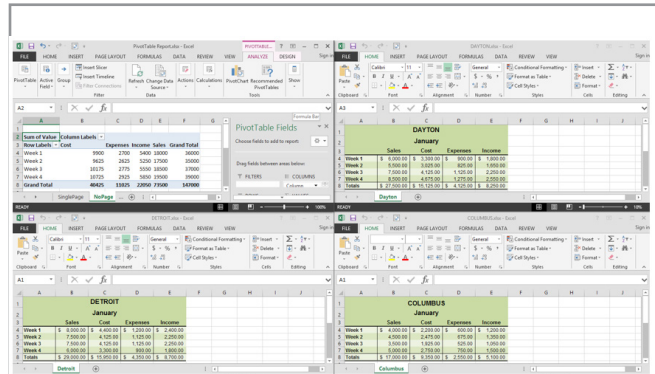
20. When the **Wizard** completes, you will be returned to the **Tiled** view and **PivotTable Report.xlsx** will be active.

21. Maximize the workbook to see the report fields. Click on the filter buttons and change what is displayed.

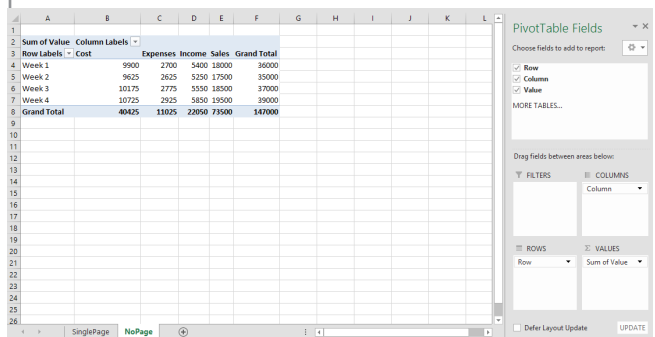
22. Press **[F12]** and save your file as **My PivotTable Report.xlsx**.

23. Leave your files open and in **Tiled** view.

### Results/ Comments:



Completed consolidated sheet and workbooks in Tiled View.



Completed consolidated sheet in Maximized Window View.



## Using a Generated Page Field

There are other options in the **PivotTable and PivotChart Wizard** which will change the type and way that your data will be displayed when consolidated.

One is to include a **Page Field** which will allow you to filter the resulting **PivotTable**. Essentially, a **Page Field** is a **Report Filter** for the **PivotTable** that is generated by the wizard.

In our example consolidation of **Columbus, Dayton and Detroit** for the fields of **Sales, Cost, Expenses and Income**, we consolidated into a **PivotTable Report** to show all three of the cities' weeks as rows with the fields as column headings.

If you compare them on the surface, they are identical, except for the additional heading of **Page1** and **(All)** with a drop-down in the adjacent column. The addition of this **Page1 Field** gives you the opportunity to filter your data by a new selection called **Item**, which represents the cities in your **PivotTable Report**.

4	Page1	(All)					
5	Sum of Value	Column Labels					
6	Row Labels	Cost	Expenses	Income	Sales	Grand Total	
7	Week 1	9900	2700	5400	18000	36000	
8	Week 2	9625	2625	5250	17500	35000	
9	Week 3	10175	2775	5550	18500	37000	
10	Week 4	10725	2925	5850	19500	39000	
11	Grand Total	40425	11025	22050	73500	147000	

PivotTable Report with Page1 Field

	A	B	C	D	E	F
4	Sum of Value	Column Labels				
5	Row Labels	Cost	Expenses	Income	Sales	Grand Total
6	Week 1	9900	2700	5400	18000	36000
7	Week 2	9625	2625	5250	17500	35000
8	Week 3	10175	2775	5550	18500	37000
9	Week 4	10725	2925	5850	19500	39000
10	Grand Total	40425	11025	22050	73500	147000

PivotTable Report without Page1 Field

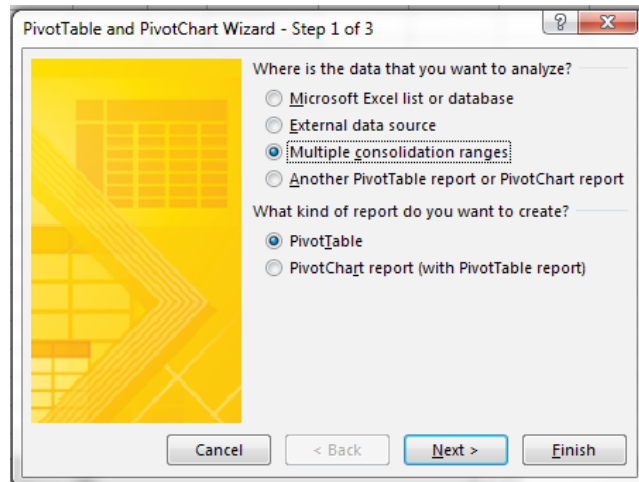


## Using a Generated Page Field, continued

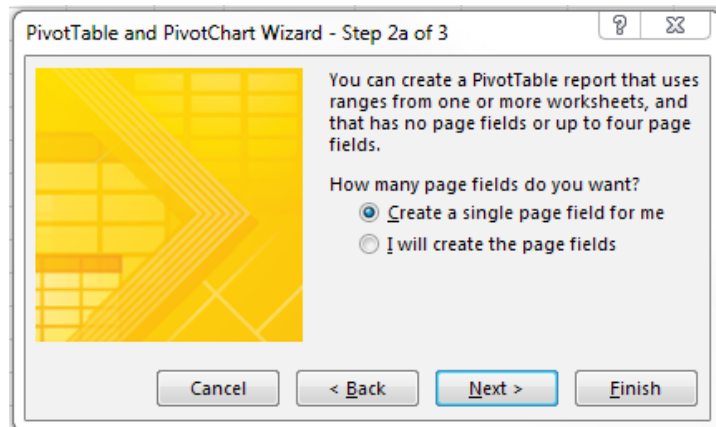
### Using a Single Generated Page Field to Consolidate Data

To combine data from all your ranges and create a consolidation that contains a single *Page Field* do the following:

- ◆ Click in a blank cell that is not currently part of a **PivotTable** Report.
- ◆ Start the **PivotTable and PivotChart Wizard**.
- ◆ On **Step 1** of the **PivotTable and PivotChart Wizard**, click **Multiple consolidation ranges**, then click [Next].



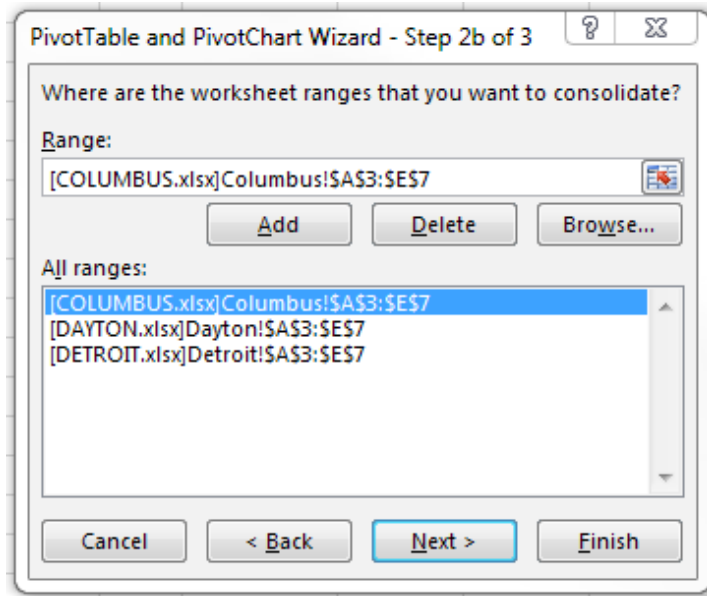
- ◆ On **Step 2a** of the **PivotTable and PivotChart Wizard**, click **Create a single page field for me**, then click [Next].



# Using a Generated Page Field, continued

**Note** If the cell ranges that you want to add are located in other workbooks, open those workbooks first to make accessing the cell ranges easier.

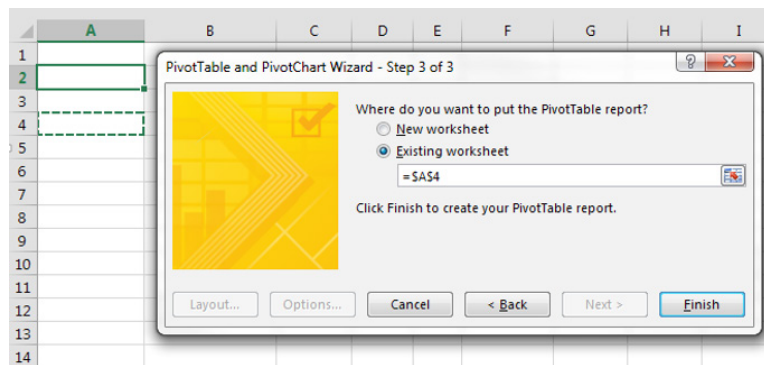
- On **Step 2b** of the **PivotTable and PivotChart Wizard**, for each range of cells you want to select, click on the **[Collapse Dialog Box]** button, or click into the *Range* text box and select the cell range on the worksheet. Then click **[Add]**.



- When all the ranges have been added, select **[Next]**.

To edit any ranges that you have added, select the range in the *All ranges:* list and click the **[Delete]** button. Then, you can add the the correct range.

- On **Step 3** of the **PivotTable and PivotChart Wizard**, select **New Worksheet** or use the **[Collapse Dialog Box]** button to place your **PivotTable Report** in an **Existing Worksheet**, then click **[Finish]**.



## Using a Generated Page Field, continued

- When the **PivotTable and PivotChart Wizard** closes you will return to your master worksheet which displays the consolidation of the data ranges that you selected.
- The master worksheet will contain the **PivotTable Report** and display the **PivotTable Field List** on the right-hand side of the worksheet.

What you will notice is the additional **Page1 Field** at the top of your **PivotTable Report**.

Page field →

Sum of Value	Column Labels	Expenses	Income	Sales	Grand Total
Row Labels	Cost				
Week 1	9900	2700	5400	18000	36000
Week 2	9625	2625	5250	17500	35000
Week 3	10175	2775	5550	18500	37000
Week 4	7425	2025	4050	13500	27000
<b>Grand Total</b>	<b>37125</b>	<b>10125</b>	<b>20250</b>	<b>67500</b>	<b>135000</b>

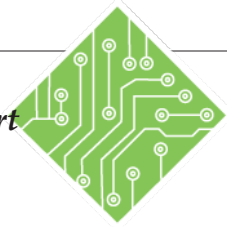
**Note**  
**Page Fields** are always displayed in alphabetical order even though they are assigned the names Item1, Item2, etc.

- Click on the **(All)** drop-down and you will see **Item1**, **Item2**, and **Item3** which represent **Columbus**, **Dayton**, and **Detroit**.

Sum of Value	Column Labels	Expenses	Income	Sales	Grand Total
Row Labels	Cost				
Week 1	2200	600	1200	4000	8000
Week 2	2475	675	1350	4500	9000
Week 3	1925	525	1050	3500	7000
Week 4	2750	750	1500	5000	10000
<b>Grand Total</b>	<b>9350</b>	<b>2550</b>	<b>5100</b>	<b>17000</b>	<b>34000</b>

Filtered for Item1 and displaying information for Columbus.

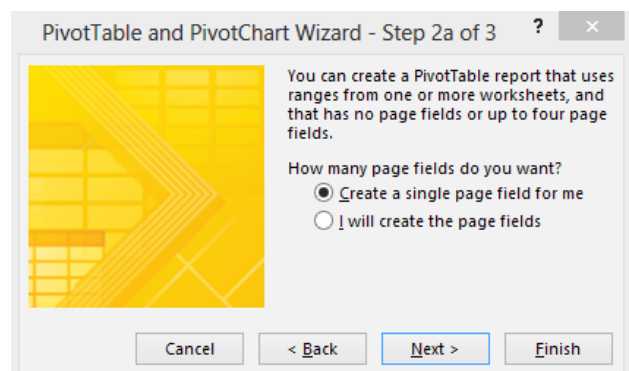
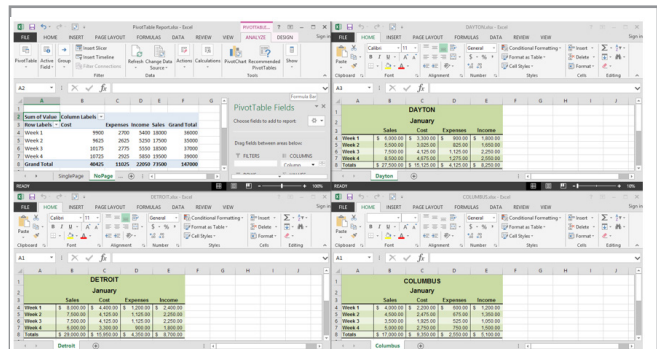
## Action 4.2 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard and Adding Page Fields



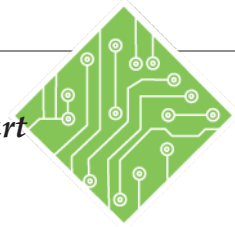
### Instructions:

1. Your file **My PivotTable Report.xlsx** should still be open.  
  
The **Columbus.xlsx**, **Dayton.xlsx** and **Detroit.xlsx** files should be open and all four workbooks should still be displayed in a **Tiled** view.
2. Click on cell **A2** in the **SinglePage** worksheet, of the **MyPivotTable Report** file, to activate it.
3. Select and launch the [**PivotTable and PivotChart Wizard**] from the **QAT**.
4. In **Step 1** of the **PivotTable and PivotChart Wizard**, select the **Multiple consolidation ranges** option button. Make sure the **PivotTable** option button is selected, then select [**Next**].
5. In **Step 2a** of the **PivotTable and PivotChart Wizard**, select the **Create a single page field for me** option button. Select [**Next**].
6. In **Step 2b** of the **PivotTable and PivotChart Wizard**, select the range **A3:E7** in the **Columbus.xlsx** workbook.
7. Select [**Add**] to add the range to the *All Ranges* area.

### Results/ Comments:



## Action 4.2 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard and Adding Page Fields, continued



### Instructions:

- Repeat the steps above to add the fields from **Dayton.xlsx** and **Detroit.xlsx**.
- When you have all three workbooks added, click **[Next]**.
- In **Step 3** of the **PivotTable and PivotChart Wizard**, select where you will be placing your **PivotTable Report**. Cell text box should be set to **\$A\$4**.
- Click **[Finish]** to create your **PivotTable Report**.
- In cell **B2**, select the **(All)** drop-down and select **Item1**. Click **[OK]**.
- Click on the filter button and change to **Item2** and then **Item3** to see how the display changes.

### Results/ Comments:

Sum of Value	Column Labels				
Row Labels	Cost	Expenses	Income	Sales	Grand Total
Week 1	9900	2700	5400	18000	36000
Week 2	9625	2625	5250	17500	35000
Week 3	10175	2775	5550	18500	37000
Week 4	10725	2925	5850	19500	39000
<b>Grand Total</b>	<b>40425</b>	<b>11025</b>	<b>22050</b>	<b>73500</b>	<b>147000</b>

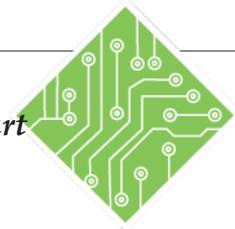
You are now viewing the results for **Columbus.xlsx**. Notice that the **PivotTable Report** changes to display **Item1** and a **[Filtered]** button appears next to **Item1** in the heading.

### Is it easy to tell which City is being displayed?

No, the cities are only referred to as **Item1**, **Item2** and **Item3** in the list and not by the individual city's name.

This is the default display and you cannot modify it in the **Page1** settings.

*Action 4.2 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard and Adding Page Fields, continued*



**Instructions:**

14. Select the **Page1 Field** from the **PivotTable Field List Report Filter** area and drag it into the **Rows** area.
15. Select the *Home Tab*, from the **Editing** group, from the **[Find & Select]** drop-down, select **[Replace...]**.
16. In the *Find what:* text box enter **Item1** and in the *Replace with:* box, type **Columbus**, then select **[Replace All]**.
17. Repeat this step replacing **Item2** with **Dayton**, and **Item3** with **Detroit**.
18. Close the *Find and Replace* dialog box.
19. Move the **Page1** field back to the **Filters** area.
20. Click on the filter button for **Page1**
21. Save **My PivotTable Report.xlsx** and close the file.
22. Close the **Columbus.xlsx**, **Dayton.xlsx** and **Detroit.xlsx** files and when prompted, select **[Don't Save]**.

**Results/ Comments:**

This adds each Item number under the Week with a breakdown for **Item1**, **Item2**, and **Item3**.

Since you cannot change **Item1**, **Item 2** and **Item3** to the actual city names, in the **Page1** setup, we will use the **[Replace]** button.

This opens up the *Find and Replace* dialog box.

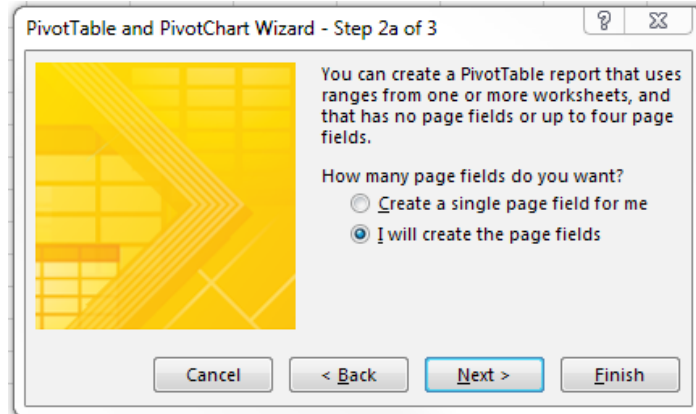
Observe the Page1 field values now:

3						
4	Sum of Value	Column Labels				
5	Row Labels	Cost	Expenses	Income	Sales	Grand Total
6	Week 1	9900	2700	5400	18000	36000
7	Columbus	2200	600	1200	4000	8000
8	Dayton	3300	900	1800	6000	12000
9	Detroit	4400	1200	2400	8000	16000
10	Week 2	9625	2625	5250	17500	35000
11	Columbus	2475	675	1350	4500	9000
12	Dayton	3025	825	1650	5500	11000
13	Detroit	4125	1125	2250	7500	15000
14	Week 3	10175	2775	5550	18500	37000
15	Columbus	1925	525	1050	3500	7000
16	Dayton	4125	1125	2250	7500	15000
17	Detroit	4125	1125	2250	7500	15000
18	Week 4	10725	2925	5850	19500	39000
19	Columbus	2750	750	1500	5000	10000
20	Dayton	4675	1275	2550	8500	17000
21	Detroit	3300	900	1800	6000	12000
22	Grand Total	40425	11025	22050	73500	147000
23						

## Creating Your Own Page Field

You may wish to create your own Page Field to filter the PivotTable Report based on the fields you choose. To do this, make your specific selections in Steps 2a and 2b.

- ◆ On **Step 2a** of the **PivotTable and PivotChart Wizard**, click **I will create the page fields**, then click **[Next]**.



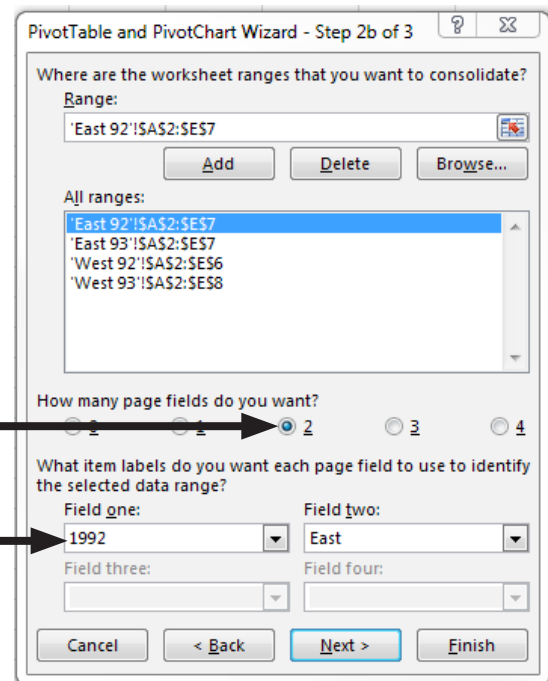
- ◆ On **Step 2b** of the **PivotTable and PivotChart Wizard**, select the cell range on the worksheet. Then click **[Add]**.
- ◆ Before clicking next, select how many page fields you wish to create.
- ◆ Then, click on the ranges in the *Range* text box individually and type or select the **Page Field** the range belongs in.

### Note

Once you have created a **Page Field** in **Step 2b** of the **PivotTable and PivotChart Wizard**, it will appear in the drop-down list.

Number of page fields

Page field title





## Creating Your Own Page Field, continued

- ◆ When all the ranges and **Page Fields** have been added, select **[Next]**.
- ◆ Continue with the remaining steps of the **PivotTable and PivotChart Wizard**.



## Action 4.3 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard and Adding Your Own Page Fields

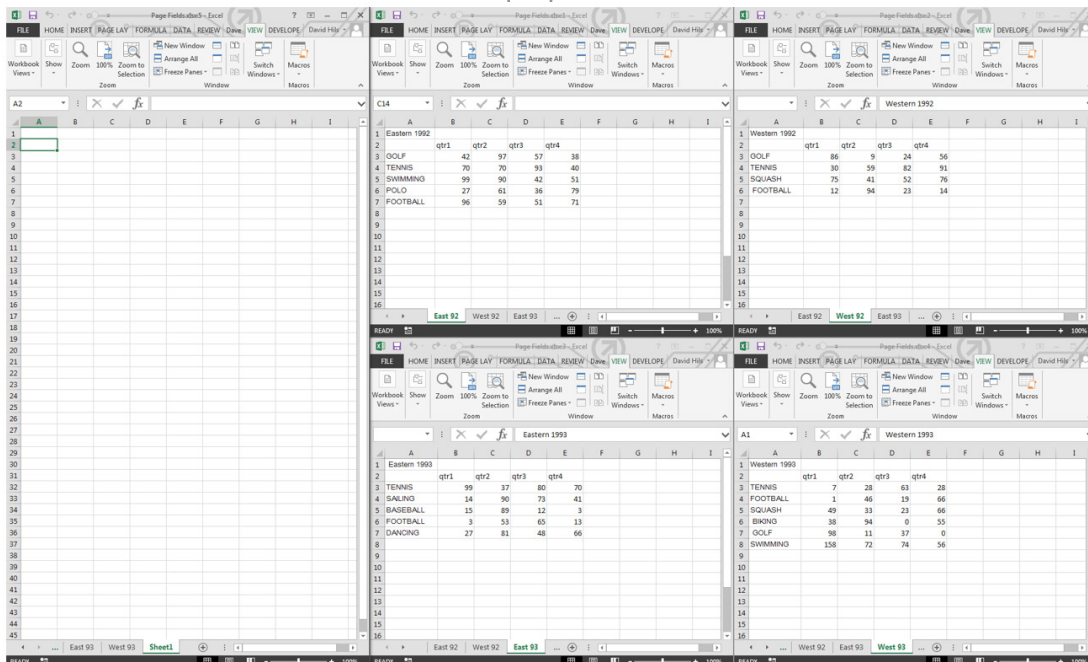
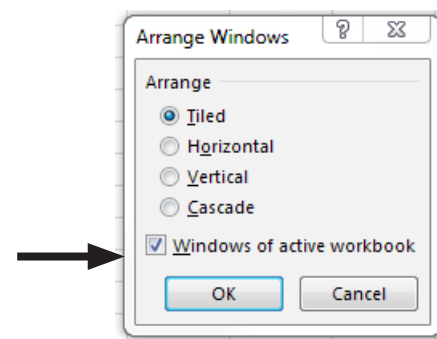


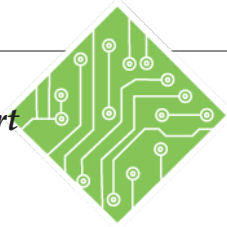
### Instructions:

1. Open **Page Fields.xlsx** from the exercise files folder.
2. Click on the **View Tab** and click on the **[New Window]** button 4 times.
3. Click on the **[Arrange All]** button on the **View Tab**. Select **Tiled** and Click on the checkbox for **Windows of Active Workbook**.
4. Click **[OK]**.
5. Click into each window to activate it and select the appropriate sheet that you wish to see on top.

### Results/ Comments:

This will create 4 new windows of the same file. Notice the **Title Bar** shows the window number after the filename.





**Instructions:**

6. Click on cell **A2** of **Sheet1**, in the **Page Fields** file, to activate it.
7. Select and launch the [**PivotTable and PivotChart Wizard**] from the **QAT**.
8. In **Step 1** of the **PivotTable and PivotChart Wizard**, select the **Multiple consolidation ranges** option button. Make sure the **PivotTable** option button is selected, then select [**Next**].
9. In **Step 2a** of the **PivotTable and PivotChart Wizard**, select the **I will create the page fields** option button. Select [**Next**].
10. In **Step 2b** of the **PivotTable and PivotChart Wizard**, select the range **A2:E7** in the window that shows the **East92** worksheet.
11. Select [**Add**] to add the range to the *All Ranges* area.
12. Repeat steps 10 and 11 to add the fields from the **West92**, **East93**, and **West93** worksheets.
13. When you have all four worksheet ranges added, select **2** under *How many page fields do you want?*
14. Select '**East92**!\$A\$2:\$E\$7 in the *All ranges:* textbox.
15. Type **1992** in the *Field one:* text box.
16. Type **East** in the *Field two:* text box.

**Results/ Comments:**

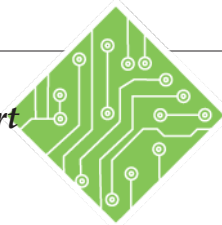
Notice the ranges are not all the same size.

You will select each data range and assign it to the filter fields.

This will create the field filter **1992**.

This will create the field filter **East**.

## Action 4.3 - Creating a PivotTable Using the PivotTable and PivotChart Consolidation Wizard and Adding Your Own Page Fields, continued



### Instructions:

17. Select '**East93**!\$A\$2:\$E\$7 in the *All ranges*: text box.
18. Type **1993** in the *Field one*: text box.
19. Click the down-arrow in the *Field two*: text box and select **East**.
20. Select '**West92**!\$A\$2:\$E\$6 in the *All ranges*: text box.
21. Click the down arrow in *Field one*: and select **1992**.
22. Click into the text box in *Field two*: and type **West**.
23. Select '**West93**!\$A\$2:\$E\$8. Click the down-arrow on *Field one*: and select **1993**. Click the down-arrow on *Field two*: and select **West**.
24. Click [**Next**].
25. In **Step 3** of the **PivotTable and PivotChart Wizard**, select where you will be placing your **PivotTable Report**.
26. Click [**Finish**] to create your **PivotTable Report**.
27. Maximize the window that is showing **Sheet1**.

### Results/ Comments:

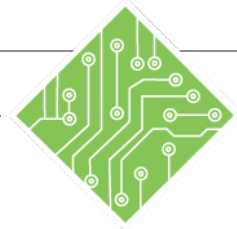
This will create the filter field **1993**.

Since this field has already been created, you can select it from the list.

This will create the filter field **West**.

You may need to click on cell **A2** in **Sheet1** again.

	A	B	C	D	E	F
1	Page1	(All)				
2	Page2	(All)				
3						
4	Sum of Value	Column Labels				
5	Row Labels	qtr1	qtr2	qtr3	qtr4	Grand Total
6	BIKING	38	94	0	55	187
7	FOOTBALL	12	94	23	14	143
8	GOLF	98	11	37	0	146
9	BASEBALL	15	89	12	3	119
10	DANCING	27	81	48	66	222
11	FOOTBALL	100	158	135	150	543
12	GOLF	128	106	81	94	409
13	POLO	27	61	36	79	203
14	SAILING	14	90	73	41	218
15	SQUASH	75	41	52	76	244
16	SQUASH	49	33	23	66	171
17	SWIMMING	257	162	116	107	642
18	TENNIS	107	157	238	159	661
19	TENNIS	88	27	88	78	281



**Instructions:**

28. In cell **B1**, select the **(All)** drop-down and select **1992**. Click **[OK]**.
29. Click on the filter button in cell **B2** and select **East**. Click **[OK]**.
30. Save as My Page Fields.xlsx and close the file.

**Results/ Comments:**

The **PivotTable** is filtered and shows figures from both regions for **1992**.

Now the **PivotTable** shows only data from the **East92** sheet.

## Using Calculated Fields and Items

You can use summary functions in value fields from an underlying data source in PivotTable Reports. If they do not provide the results that you want or need, you can create your own Formulas using Calculated Fields and Calculated Items.

The difference between a Calculated Field and a Calculated Item is that a Calculated Field will add an additional row or column to your PivotTable, which then becomes a row or column from which other calculations can be created. A Calculated Item, on the other hand, creates a calculation within a field.

For example, you might use a summary function to add up January, February, and March to return a First Quarter Total. You could then use First Quarter Total as a Calculated Field in a formula.

An example of a Calculated Item would be if you want to sum only those occurrences on certain days of the week.

When you are working with Calculated Fields, it is important to remember the summary functions that are available for source data (with the exception of On Line Analytical Processing or OLAP data).

Function	Summarizes
<b>SUM</b>	Sum of the values. Default function for numeric data.
<b>COUNT</b>	Counts the number of data values.
<b>AVERAGE</b>	The average of the values.
<b>MAX</b>	The largest value.
<b>MIN</b>	The smallest value.
<b>PRODUCT</b>	The product of the values.
<b>COUNT NUMBERS</b>	Counts the number of data values that are numerical.
<b>StDEV</b>	Estimate of the standard deviation of a population, where the sample is a subset of the entire population.
<b>StDEVP</b>	Standard deviation of a population, where the population is all of the data to be summarized.
<b>VAR</b>	Estimate of the variance of a population, where the sample is a subset of the entire population.
<b>VARP</b>	The variance of a population, where the population is all of the data to be summarized.

## Using Calculated Fields and Items, continued

In addition to these summary functions, there are other functions available for **Custom Calculations** in **Value Fields**. The list below shows some of the available options from the **Show Values As** calculations list.

Function	Result
<b>Difference From</b>	Displays values as the difference from the value of the Base Item in the Base Field.
<b>% Of</b>	Displays values as a percentage of the value of the Base Item in the Base Field.
<b>% Difference From</b>	Displays values as the percentage difference from the value of the Base Item in the Base Field
<b>Running Total In</b>	Displays the value for successive items in the Base Field as a running total.
<b>% of Row</b>	Displays the value in each row or category as a percentage of the total for the row or category.
<b>% of Column</b>	Displays all of the values in each column or series as a percentage of the total for the column or series
<b>% of Total</b>	Displays values as a percentage of the Grand Total of all of the values or data points in the report.
<b>Index</b>	Calculates values as follows: $\frac{((\text{Value in Cell}) \times (\text{Grand Total of Grant Totals}))}{((\text{Grand Row Total}) \times (\text{Grand Column Total}))}$

If **Summary Functions** and **Custom Calculations** do not provide the desired results, you can create your own **Formulas** in **Calculated Fields** and **Calculated Items**.

For data that comes from an *external data source* or from *worksheet data*, Excel uses the **Sum** function to calculate **Value Fields** that contain numeric data, and the **Count** function to calculate **Value Fields** that contain text.

You can choose a different summary function like **Average**, **Max** or **Min** to further analyze or customize the data.

## Using Calculated Fields and Items, continued

When you use **Formulas** in a **PivotTable Report**, you must be aware of syntax rules and formula behaviors.

- ◆ You can use operators and expressions as you do in other worksheet formulas.
- ◆ You can use constants and refer to data from the report, however you cannot use cell references or defined names.
- ◆ Formulas for **Calculated Fields** operate on the sum of the underlying data for any fields in the formula. Therefore, you cannot sort a **Calculated Field**.
- ◆ Formulas cannot refer to totals.
- ◆ You can include the **Field Name** in a reference to an **Item** but the **Item Name** must be in square [ ] brackets.
- ◆ If you refer to an **Item** by its position in your **PivotTable Report** as it is currently sorted and displayed, the **Item** referred to can change whenever the position of the **Item** changes or is displayed or hidden. Hidden **Items** will not be counted in an index.
- ◆ You cannot add **Calculated Items** to **PivotTable** data that contains **Averages**.
- ◆ You cannot add **Calculated Items** to data that has been **Grouped**.

### Creating a Formula in a PivotTable Report

- ◆ Decide whether you are creating a Calculated Field or a Calculated Item within a field.

Use a Calculated Field when you want to use the data from another field in your formula.

Use a Calculated Item when you want something calculated *within* a field.

## Using Calculated Fields and Items, continued

### Note

Once a **Calculated Field** is created, it is added to the **Field List** and can be used in other calculations.

### Adding a Calculated Field

- ◆ Click in the **PivotTable Report**.
- ◆ On the *Analyze Tab*, in the **Calculations** group, click on **[Fields, Items, & Sets]**, then select **Calculated Field**
- ◆ In the *Name* box, type a **Name** for the **Field**.
- ◆ In the *Formula* box, enter the **Formula** for the **Field**.
- ◆ To use data from another **Field** in the **Formula**, click the **Field** in the *Fields* box, then click **[Insert Field]**, click **[Add]**.

### Adding a Calculated Item to a Field

- ◆ If the **Items** in the **Field** are grouped, select the *Analyze Tab*, in the **Group** group select **[Ungroup]**.
- ◆ Select the **Field** where you want to place the **Calculated Item**.
- ◆ On the *Analysis Tab*, in the **Calculations** group, click on **[Fields, Items, & Sets]**, then select **Calculated Item**.
- ◆ In the *Name* box, type a **Name** for the **Calculated Item**.
- ◆ In the *Formula* box, enter the **Formula** for the **Item**.
- ◆ To use data from an **Item** in the **Formula**, click the **Item** in the *Items* list, then click **[Insert Item]**. The item must be from the same field as the **Calculated Item**.
- ◆ Click **[Add]**. You can regroup the items if you ungrouped them previously.
- ◆ For **Calculated Items**, different **Formulas** can be entered cell by cell.

### Changing a Formula

- ◆ Click the cell that you want to change the *Formula* in.  
If you are changing several **Formulas**, click on the first cell to be changed, hold down the **[Ctrl]** key, click on the next cells to be changed,
- ◆ In the **Formula Bar**, make the changes to your **Formula**.

## Using Calculated Fields and Items, continued

### Note

To temporarily remove a **Calculated Field** from the **PivotTable**, deselect the checkbox in the **Field List Task Pane**.

### Note

To apply filter buttons to the heading of a **Calculated Item** or **Field**, press **[Ctrl + Shift + L]**.

## Changing the Order

If you are not getting the results that you expected, you can change the *order* in which the calculations are performed for your **Multiple Calculated Items**.

- ◆ Click on a cell inside your PivotTable Report.
- ◆ On the *Analyze Tab*, in the **Calculations** group, click on **[Fields, Items, & Sets]**, then select **Solve Order**
- ◆ Select a **Formula**, click on the **[Move Up]** or **[Move Down]** button to change the **Formula** calculation order.

## Displaying Formulas

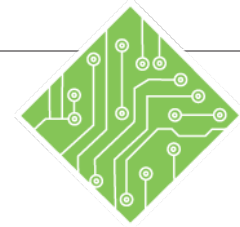
To display or view all the **Formulas** that you are using in your **PivotTable Report** do the following:

- ◆ On the *Analyze Tab*, in the **Calculations** group, click on **[Fields, Items, & Sets]**, then select **List Formulas**.

This is also a quick way to edit **Formulas** for **Calculated Fields** or **Calculated Items**. Select the **Formula** you want to edit from the list and perform the edit.

- ◆ On the *Analyze Tab*, in the **Calculations** group, click on **[Fields, Items, & Sets]**, then select **Calculated Item**.
- ◆ In the *Name* box, select the **Calculated Item** using the drop-down arrow, and in the *Formula* box, edit the formula, click **[Modify]**.
- ◆ To delete a **Formula**, select **[Delete]**.

## Action 4.4 - Creating a Calculated Field in a PivotTable Report



### Instructions:

1. Open the workbook named PivotTable Calculated.xlsx.
2. Save the workbook as **My PivotTable Calculated.xlsx**.
3. Create a **PivotTable Report** for the data presented in the range **A1:C10**.

### Results/ Comments:

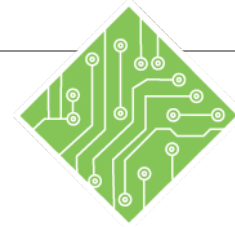
#### Your Scenario:

You will be working with this **Sales** information after your **PivotTable Report** has been created to present it to the *Sales Manager*.

He would like to see your **PivotTable Report** formatted so the **Row Headings** read as *Region*, the **Column Headings** show each individual *Month*, and a *Grand Total* for each *Region* and a *Grand Total* for each *Month*. Format the **Sales** figures with the **Currency** format. Edit cell F2 to read "Month" and E3 to read "Region". Your initial **PivotTable Report** should resemble something like the one below after you have created it and made the requested changes:

	A	B	C	D	E	F	G	H	I
1	<b>Region</b>	<b>Month</b>	<b>Sales</b>						
2	South	May	\$ 8,677.00		Sum of Sales Month <input type="button" value="v"/>				
3	South	Apr	\$ 450.00		Region <input type="button" value="v"/>	Mar	Apr	May	Grand Total
4	North	Apr	\$ 1,500.00		East	\$2,741.00	\$9,136.00	\$5,416.00	\$17,293.00
5	South	May	\$ 3,802.00		North		\$10,791.00		\$10,791.00
6	East	Mar	\$ 2,741.00		South		\$450.00	\$12,479.00	\$12,929.00
7	North	Apr	\$ 9,291.00		West			\$5,477.00	\$5,477.00
8	West	May	\$ 5,477.00		<b>Grand Total</b>	<b>\$2,741.00</b>	<b>\$20,377.00</b>	<b>\$23,372.00</b>	<b>\$46,490.00</b>
9	East	May	\$ 5,416.00						
10	East	Apr	\$ 9,136.00						
11	<b>Total</b>		<b>\$ 46,490.00</b>						

*Action 4.4 - Creating a Calculated Field in a PivotTable Report, continued*



**Instructions:**

**Results/ Comments:**

You have completed the **PivotTable Report** as requested and shown it to the *Sales Manager* and he has decided that he would like to see a custom calculated field to forecast a 10% increase for each *Region*. You will do this by creating a **Calculated Item**.

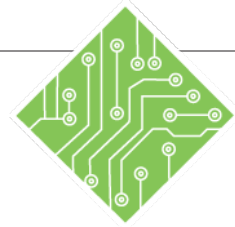
4. Click on a **cell** inside the **PivotTable Report**. On the *PivotTable Tools Tab*, select the *Design Tab*. In the **Layout** group, select the **[Grand Totals]** drop-down and select **off for Rows and Columns**.
5. Click on the **May** column heading.
6. On the *PivotTable Tools Tab*, select the *Analyze Tab*. In the **Calculations** group, select the **[Fields, Items & Sets]** drop-down and select **Calculated Item**. The *Insert Calculated Item* dialog box will open.
7. In the *Name:* box, enter **Forecast**.
8. In the *Formula:* box, enter the formula to calculate the **Sum** for **March, April and May** and then multiply it by 110%.
9. Type **=Sum(** and then click on **Mar**, then click on the **[Insert Item]** button, then type **,**. Click on **April** and click on the **[Insert Item]** button, then type **,**. Do the same for **May**. Then type **)\*1.1**.

To insert the **Calculated Items** and **Calculated Fields** needed to complete the request, we will need to turn off the **Grand Totals** that are currently being displayed.

Region	Mar	Apr	May
East	\$2,741.00	\$9,136.00	\$5,416.00
North		\$10,791.00	
South		\$450.00	\$12,479.00
West			\$5,477.00

**=Sum(Mar, Apr, May)\*1.1**

## Action 4.4 - Creating a Calculated Field in a PivotTable Report, continued



### Instructions:

- When you have all three **Months** in the *Formula:* box, click on **[OK]**.

### Results/ Comments:

This places a column titled Forecast to the right and puts a forecasted total for each of the regions.

Sum of Sales	Column Labels			
Row Labels	Mar	Apr	May	Forecast
East	\$2,741.00	\$9,136.00	\$5,416.00	\$19,022.30
North		\$10,791.00		\$1,079.10
South		\$450.00	\$12,479.00	\$1,292.90
West			\$5,477.00	\$547.70

### Your Next Scenario:

The *Sales Manager* likes what you have done so far, but now he needs to figure out how much of a **Bonus** he needs to pay each **Region** based on their **Monthly Sales Total**.

The standard **Bonus** that is paid is 3% of the *Monthly Sales Total* if the *Sales Total* is *Greater Than \$5,000* in that *Month*.

You need to calculate the **Bonus** amount for each month and display that in your **PivotTable Report**. To do this, you are going to need to create a **Calculated Field** with a formula.

- Click on a cell inside the **PivotTable Report**.
- On the *PivotTable Tools Tab*, select the *Analyze Tab*. In the the **Calculations** group, select the **[Fields, Items & Sets]** drop-down and select **Calculated Field**.
- In the *Name:* box enter **Bonus**. Clear the *Formula:* box and enter in the formula to calculate the **Bonus** based on the scenario's criteria.

The *Insert Calculated Field* dialog box will open.

The scenario indicated that to be eligible for a bonus that month, the sales have to be greater than \$5,000. The standard bonus amount is 3% of the monthly sales amount. An **IF** function will need to be entered into the formula.

*Action 4.4 - Creating a Calculated Field in a PivotTable Report, continued*

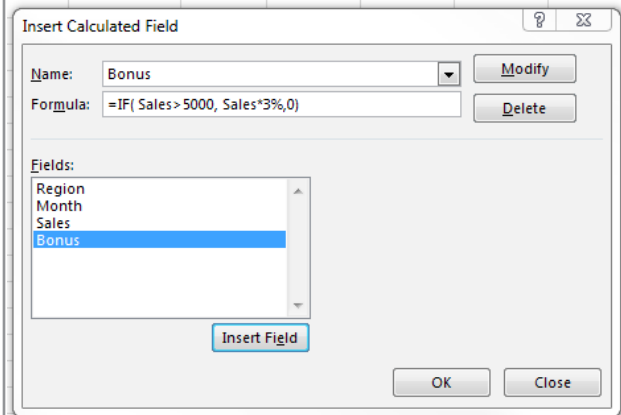


**Instructions:**

14. To insert **Sales** into your formula, select **Sales** from the *Fields:* text box. Then select **[Insert Field]**.
15. Enter in the remainder of the formula  
  
Click **[Add]** to add the **Formula**.
16. Click **[OK]** to return to the **PivotTable Report** and view the new column.

**Results/ Comments:**

**=IF(Sales >5000,Sales\*3%,0)**



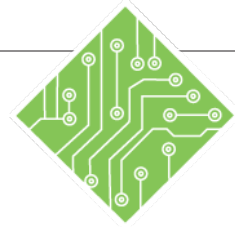
Your **PivotTable Report** will now have a column called **Sum of Bonus** displayed next to the **Sum of Sales** column, with each individual month labeled above it.

Region	Month		Apr		May		Forecast	
	Mar		Sum of Sales	Sum of Bonus	Sum of Sales	Sum of Bonus	Sum of Sales	Sum of Bonus
East	\$2,741.00	\$ -	\$9,136.00	\$ 274.08	\$5,416.00	\$ 162.48	\$19,022.30	\$ 570.67
North		\$ -	\$10,791.00	\$ 323.73		\$ -	\$11,870.10	\$ 356.10
South		\$ -	\$450.00	\$ -	\$12,479.00	\$ 374.37	\$14,221.90	\$ 426.66
West		\$ -		\$ -	\$5,477.00	\$ 164.31	\$6,024.70	\$ 180.74

While all the requested fields and calculations are on your report, this probably is not what your *Sales Manager* is looking for as a final product.

We will need to re-arrange our columns so our data is presented in a more logically grouped format.

*Action 4.4 - Creating a Calculated Field in a PivotTable Report, continued*



**Instructions:**

17. Drag the *Values* field from the **Columns** area to the **Rows** area.
18. On the *Design Tab*, click on the drop-down arrow on the **[Grand Totals]** button.
19. Select **On for columns only**.

Your **PivotTable Report** should look like the figure at right when you have completed all of the steps.

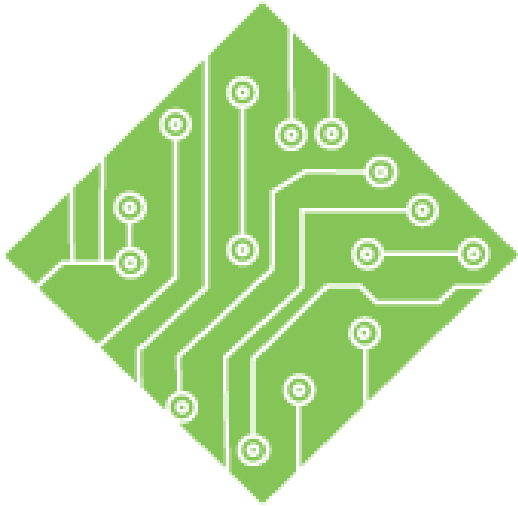
20. Take a look at your **PivotTable Report**.

- Does it meet all the criteria that the *Sales Manager* requested in the two *Scenarios*?
- Is it accurately reflecting the data? Have you selected a field or two and done a manual check to see if the formula is returning the correct answer?

21. Save **My PivotTable Calculated.xlsx** and close the file.

**Results/ Comments:**

	Month			
Region	Mar	Apr	May	Forecast
<b>East</b>				
Sum of Sales	\$2,741.00	\$9,136.00	\$5,416.00	\$19,022.30
Sum of Bonus	\$ -	\$ 274.08	\$ 162.48	\$ 570.67
<b>North</b>				
Sum of Sales		\$10,791.00		\$11,870.10
Sum of Bonus	\$ -	\$ 323.73	\$ -	\$ 356.10
<b>South</b>				
Sum of Sales		\$450.00	\$12,479.00	\$14,221.90
Sum of Bonus	\$ -	\$ -	\$ 374.37	\$ 426.66
<b>West</b>				
Sum of Sales			\$5,477.00	\$6,024.70
Sum of Bonus	\$ -	\$ -	\$ 164.31	\$ 180.74
<b>Total Sum of Sales</b>	<b>\$2,741.00</b>	<b>\$20,377.00</b>	<b>\$23,372.00</b>	<b>\$51,139.00</b>
<b>Total Sum of Bonus</b>	<b>\$ -</b>	<b>\$ 611.31</b>	<b>\$ 701.16</b>	<b>\$1,534.17</b>

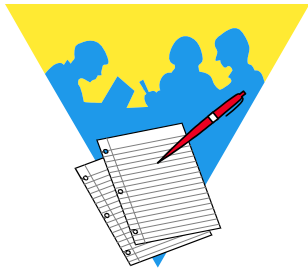


# Lesson 5: Creating PivotTables from External Data

## Lesson Overview

You will cover the following concepts in this chapter:

- ◆ Importing External Data into a PivotTable Using the PivotTable Tool.
- ◆ Importing Access Database Objects into a PivotTable
- ◆ Creating a PivotTable Using the Microsoft Query Connection
- ◆ Understanding Object Database Connections (ODBC)



## Lesson Notes



## Importing Data from External Data Sources

### Note

A *driver* is software that helps programs communicate with each other without knowing the precise details of the program being accessed.

It is often the case that the data you need for your Excel **PivotTable** is stored in a database application. Database applications are great for managing, maintaining, and retrieving large amounts of data. Database programs also provide features for defining relationships between data entities, for developing queries to extract information, and for securing sensitive information. For these reasons and more, organizations often make extensive use of databases.

Excel allows you to import data from a number of external sources. Moreover, the imported data can be linked to the source, so that any changes to the underlying source data tables can be refreshed and updated in your Excel worksheets.

The Microsoft Office suite provides drivers that will allow Excel to connect to a wide array of data sources.

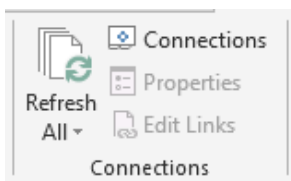
Some of the data sources that you can connect to with Excel are:

- ◆ Microsoft SQL Server
- ◆ SQL Server Analysis Services Cube
- ◆ Microsoft Access and Microsoft FoxPro
- ◆ ODBC DSN
- ◆ OLAP Services and OLAP cubes
- ◆ dBase
- ◆ Oracle
- ◆ Paradox

In this lesson, we will discuss three different methods of importing external data into a **PivotTable**.

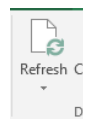
- ◆ Using the **Insert PivotTable** tool
- ◆ Using the **From Access Object** tool
- ◆ Using the **Microsoft Query Connection**

The advantages of each are discussed in their respective sections.



Connections to external data in the current workbook can be viewed and refreshed with the **[Connections]** button in the **Connections Group** on the *Data Tab*.

In a **PivotTable** or **PivotChart**, external connections can be refreshed using the **[Refresh]** button on the *Analyze Tab*.



# Importing External Data Using the PivotTable Tool

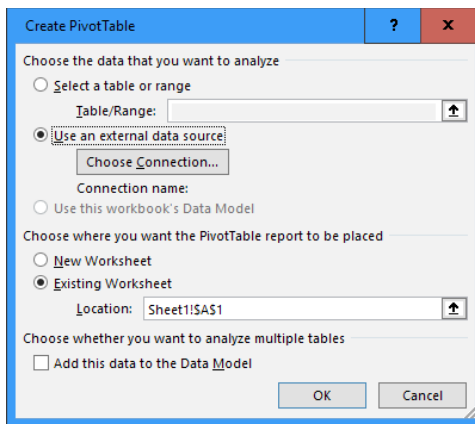
## Creating a PivotTable from External Data Using the PivotTable Tool

The advantage of creating the **External Data Connection** from the **PivotTable** tool is efficiency. By using the *Create PivotTable* dialog box, you can create the connection and the **PivotTable** simultaneously.

- ◆ Select the *Insert Tab* and click the down arrow on the **[PivotTable]** button.

The *Create PivotTable* dialog box will be displayed.

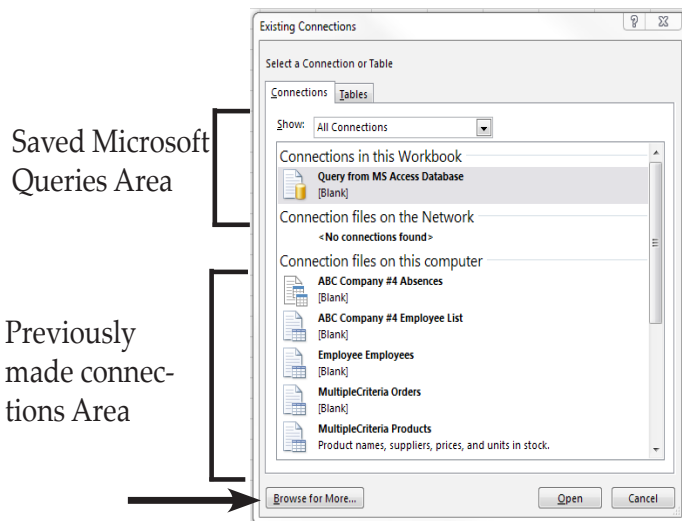
- ◆ Click the **Use an External Data Source** option button.



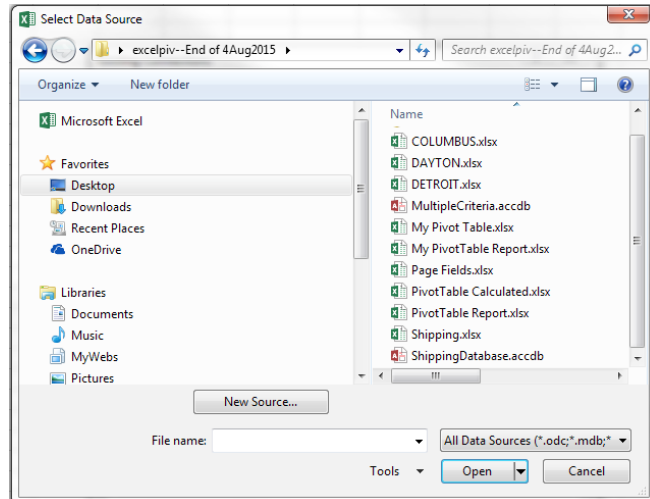
- ◆ Click the **[Choose Connection...]** button.
- ◆ When the *Existing Connections* dialog box appears, select an item from the list and click **[Open]**.

- OR -

- ◆ Select **[Browse for More...]** to select a database not yet connected.



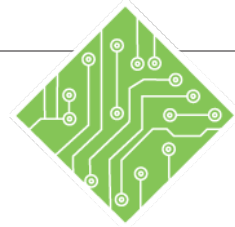
## Importing External Data Using the PivotTable Tool, continued



- ◆ Once you have selected the database, click **[Open]**.
- ◆ Depending on the external data source you have chosen, you may be asked for login credentials (a username and password) or other verifying information. If so, enter the appropriate information in the fields provided and click **[OK]**.
- ◆ You will be returned to the *Create PivotTable* dialog box to continue making your selections.
- ◆ When you click **[OK]**, the **PivotTable** will be created. You will see the **PivotTable** area and **PivotTable Field List Task Pane** as before, but now the field headings in the **PivotTable Field List** are from the external data source that you have selected.
- ◆ Once you build a **PivotTable** using external data, you can refresh the table by clicking the **Refresh** button on the *Data Tab*. You may also use the **[Refresh]** button on the *PivotTable Tools Analyze Tab* or the *PivotChart Analyze Tab*. This will update the **PivotTable** with any changes made to pertinent data in the source database.

The connection you have created will be listed in the *Existing Connections* dialog box located on the *Data Tab* in the **Connections Group** for future use.

## Action 5.1 - Creating a PivotTable from External Data Using the PivotTable Tool



### Instructions:

1. Open a blank workbook.
2. Select the *Insert Tab*.
3. From the **Tables** group, select the **[PivotTable]** button.
4. Select the **Use an external data source** option button.
5. Click **[Choose Connection...]**.
6. Click the **[Browse for More...]** button.
7. From the exercise files folder, select the **MultipleCriteria.accdb** file.
8. Click **[Open]**.
9. From the list of available tables in the *Select Table* dialog box, choose the **Products** table.
10. Click **[OK]**, then click **[OK]** again to close the *Create PivotTable* dialog box.
11. Drag **CategoryID** to the **Rows** area.
12. Drag **SupplierID** to the **Columns** area.
13. Click on the checkbox for **UnitsInStock**.
14. Save the file in your **Student Folder** with the name **Products PivotTable** and close the file.

### Results/ Comments:

This will open an **Explorer** window to allow you to browse for the database file.

This will open the *Select Table* dialog box which lists all of the tables and queries available to import.

This will create a **PivotTable** frame and show a **PivotTable Field List** with fields from the **Products** table.

## Creating a PivotTable from an Access Object

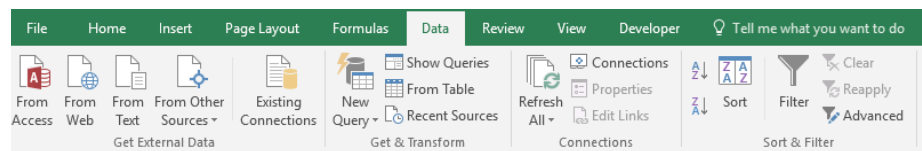
**PivotTables** can also be created from Access database objects using the *Data Ribbon*. Just like a linked spreadsheet, the data in the **PivotTable** is also linked to the data in the Access database.

The advantage to using this method is that Excel only looks for Access data, making it easier to browse for the source file.

The disadvantage to using this method is that this method does not add the connection to the existing connections for future use.

### Using the Data Ribbon

- ◆ Display Excel's *Data Ribbon*.



- ◆ In the **Get External Data** group, click the **[From Access]** button.
- ◆ The *Select Data Source* dialog box will be displayed.
- ◆ Select the Access database that will serve as the source of the data.

#### Note

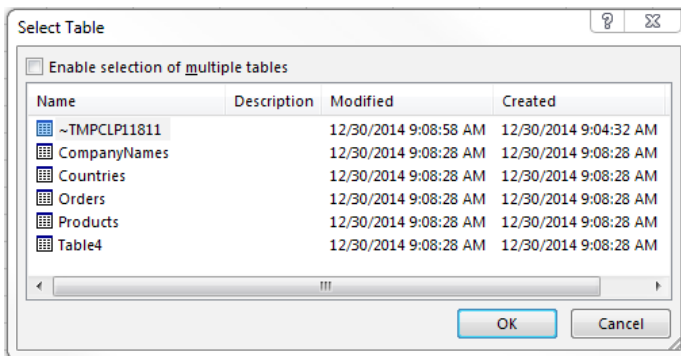
It is a good idea to run advanced queries in the database program and then connect to the resulting query or table.



- ◆ Click the **[Open]** button.

# Creating a PivotTable from an Access Object, continued

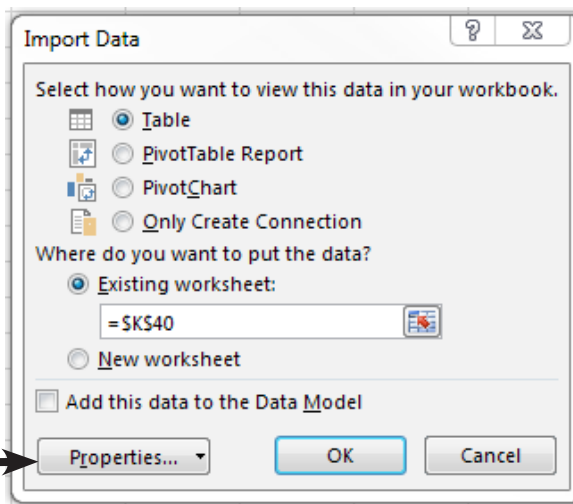
- ◆ If the Access database being used has multiple tables or queries, the *Select Table* dialog box will be displayed.



**Note**

If the Access database has only one table, the *Select Table* dialog box will not appear.

- ◆ Choose the table or query that contains your source data.
- ◆ Click the **[OK]** button.
- ◆ The next step is to use the *Import Data* dialog box to select how you want to view the imported data in Excel.



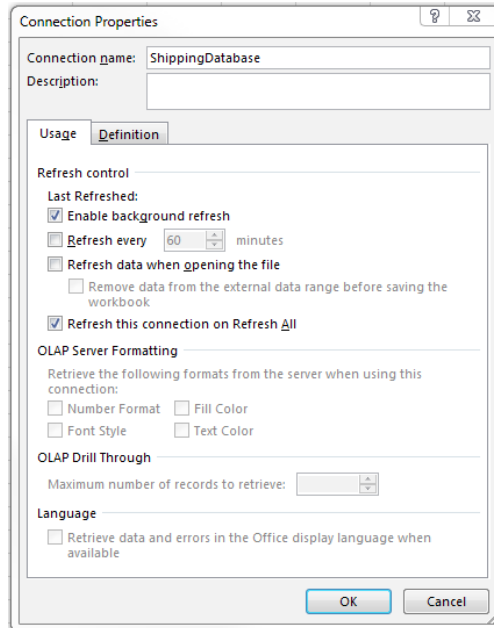
**Note**

If you miss this step, you can also access the **[Properties]** button from the **Connections** group on the *Data Tab*

- ◆ Click the **[Properties]** button in the *Import Data* dialog box to see the *Connection Properties* dialog box.

**Continued on next page**

## Creating a PivotTable from an Access Object, continued



- ◆ In this box you can enable or disable settings for connections to external data sources, and use, reuse or switch connection files.
- ◆ The *Usage* tab is used to control the way that the connection information is used in the workbook.
  - ◆ If you put a check by **Refresh data when opening the file**, the table data will be refreshed from the database when you open the Excel workbook.
  - ◆ You can also specify how much time should pass between refreshes with the **Refresh every** check box.
- ◆ The *Definition* tab controls how the connection information is defined and the source of the connection information.
  - ◆ When everything is set the way you want, click **[OK]** to implement the changes and return to the *Import Data* dialog box.
  - ◆ When you have selected the **PivotTable Report** or **PivotChart option** button in the *Import Data* dialog box, click the **[OK]** button.

**Continued on next page**

# Creating a PivotTable from an Access Object, continued

Here is the original data from the Access database.

Salesperson	Product Name	Country	Quantity
Nancy Davolio	Geitost	Italy	20
Nancy Davolio	Tarte au sucre	Italy	10
Nancy Davolio	Jack's New England Clam Chowder	Italy	20
Nancy Davolio	Teatime Chocolate Biscuits	Italy	5
Nancy Davolio	Zaanse koeken	Italy	5
Nancy Davolio	Chef Anton's Cajun Seasoning	Italy	5
Nancy Davolio	Guaraná Fantástica	Italy	12
Nancy Davolio	Raclette Courdavault	Italy	6

Here is a **PivotTable** report based on imported data from the database.

Salesperson	Country	Product Name	Sum of Quantity		
Nancy Davolio	Italy	Chef Anton's Cajun Seasoning	5		
		Geitost	20		
		Guaraná Fantástica	12		
		Jack's New England Clam Chowder	20		
		Raclette Courdavault	6		
		Tarte au sucre	10		
		Teatime Chocolate Biscuits	5		
		Zaanse koeken	5		
		Italy Total			83
		Nancy Davolio Total			83

- ◆ If you right click on the table you created in Excel, and click the *Refresh option* from the pop up menu that appears, the data in your Excel table will be updated with any changes made to the source data in the database.

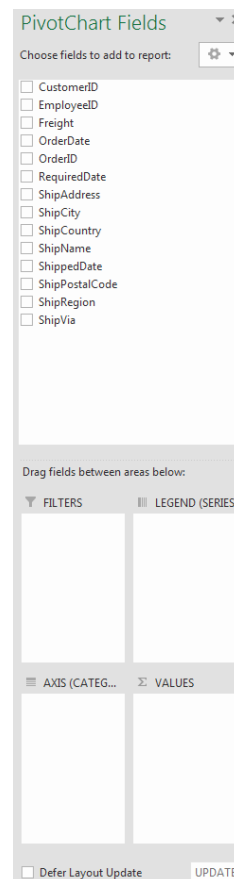
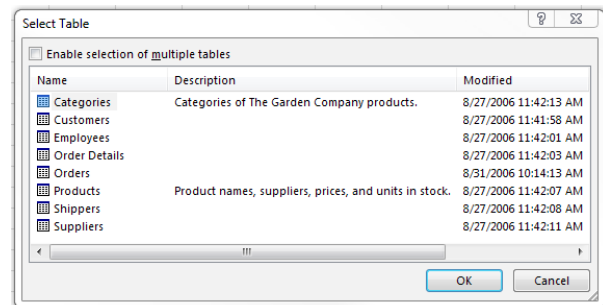
## Action 5.2 - Creating a PivotTable and PivotChart from Access Data



### Instructions:

1. Open a blank workbook.
2. Select the *Data Tab*.
3. From the **Get External Data** group, select the **[From Access]** button.
4. Select the *MultipleCriteria.accdb* database from your exercise files folder, click **[Open]**.
5. In the *Select Table* dialog box, select **Orders** and click **[OK]**.
6. In the *Import Data* dialog box, select **[PivotChart]**.
7. In the *Where do you want to put the data?* area, make sure **Existing Worksheet** is selected and the range in the text box is **[\$A\$1]**.
8. Click **[OK]**.
9. The **PivotChart** and **PivotTable** frames will appear on the worksheet and the **PivotChart Fields** will appear on the right-side of the worksheet.
10. Click on the **PivotChart** frame.
11. In the **PivotChart Fields Task Pane** select **ShipCountry** and drag to **Axis (Categories)**.

### Results/ Comments:





**Instructions:**

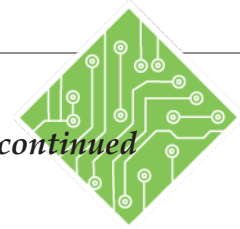
12. Then drag **ShipRegion** and **ShipPostalCode** from the **PivotChart Fields Task Pane** into the **Axis (Categories)** under **ShipCountry**.
13. Drag **Freight** into the **Values** area.
14. In the **Values** area, click on the drop-down arrow next to **Sum of Freight** and select **Value Field Settings...**
15. Select the **[Number Format]** button.
16. When the *Format Cells* dialog box opens, select **Accounting** to format the field.
17. Click **[OK]** to close the *Format Cells* dialog box, and then click **[OK]** again to close the *Value Field Settings* dialog box.
18. In the **PivotChart Fields Task Pane**, drag the **ShipPostalCode** out of the **Axis fields (Categories)** box.
19. In the *PivotChartTools*, click the **Design Tab**. In the **Chart Layouts** group, select **[AddChartElement]** and trace to **Data Table** and then select **No Legend Key**.

**Results/ Comments:**

This will start to populate the **PivotChart** and the **PivotTable** with the items that you have selected and you will begin to see how the data is going to display.

Notice that the PivotChart which is displayed does not display very useful information at this point. We will make changes to display the information we need.

Notice that the **PivotTable** changes to show totals by **Country** and **Region** and a **Grand Total** is at the bottom of the **PivotTable**.



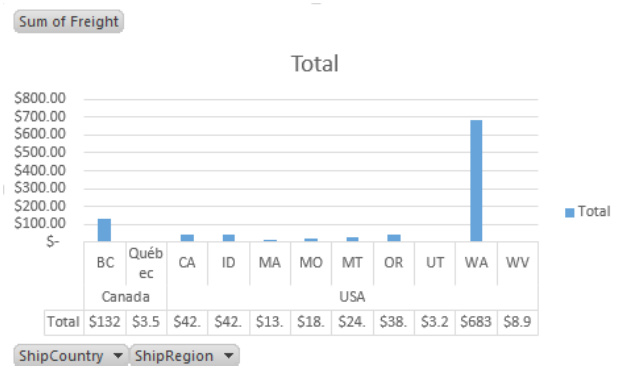
**Instructions:**

The resulting PivotTable and PivotChart should look like this:

	A	B
1	Row Labels	Sum of Freight
2	Canada	\$ 136.10
3	BC	\$ 132.60
4	Québec	\$ 3.50
5	USA	\$ 875.50
6	CA	\$ 42.60
7	ID	\$ 42.40
8	MA	\$ 13.25
9	MO	\$ 18.00
10	MT	\$ 24.50
11	OR	\$ 38.85
12	UT	\$ 3.25
13	WA	\$ 683.70
14	WV	\$ 8.95
15	<b>Grand Total</b>	<b>\$ 1,011.60</b>

- Save the file as **My PivotChart.xlsx** and close the file.

**Results/ Comments:**

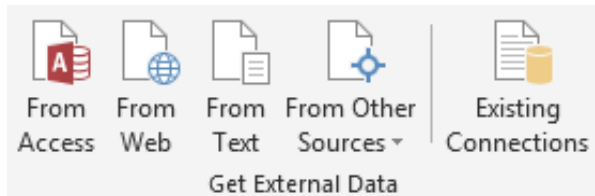


A table containing the amounts for each region appears below the horizontal axis.

# Importing Data Using Microsoft Query Connection

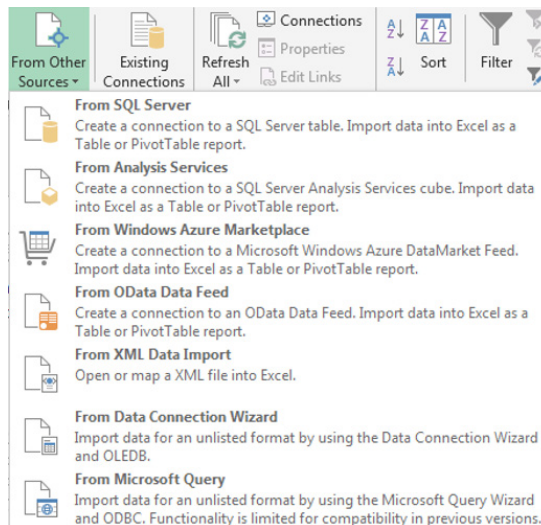
The **Microsoft Query Connection** allows you to import data from any Microsoft Application *while filtering the data*. The advantage of using this method is that the data that is imported fits a specific criteria and you do not end up with data you cannot use or that has to be deleted. In addition, any connection established using this method is added to the **Existing Connections** list and can be used in future data retrieval.

- ◆ Select the *Data Tab*.
- ◆ From the **Get External Data** group, click the **[From Other Sources]** drop-down arrow.



- ◆ A menu is displayed with a number of options for connecting to an external data source.

The bottom option in this menu, Microsoft Query, is a powerful tool that will allow you to create a connection and build a query. A *query* is a way to extract specific information from a database.



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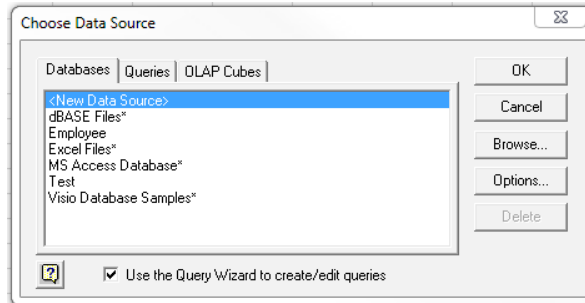
## Importing Data Using Microsoft Query Connection, continued

### Note

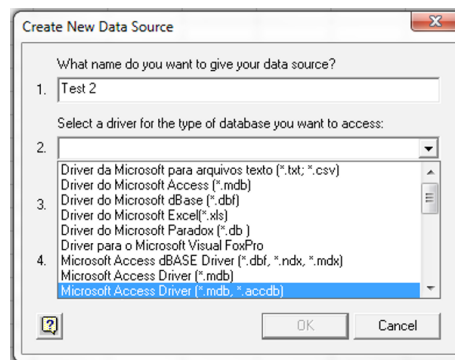
*ODBC stands for Open Database Connectivity.*

This is a utility used to define a connection between a computer and a database. The *ODBC* connection contains information needed to allow a computer user to access the information stored in a database that is not located on the local computer.

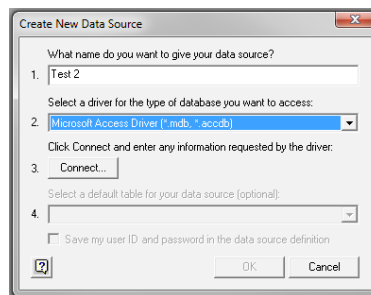
- ◆ Once you have selected **From Microsoft Query** from the **[Other Sources]** button, you will see the following dialog box. *You will be creating an ODBC connection to the database.*
- ◆ The **<New data source>** option should already be selected.



- ◆ Click **[OK]**,
- ◆ The *Create New Data Source* dialog box displays.
- ◆ Type a name for your data source.
- ◆ Click the drop-down to select a driver type for the new data source.



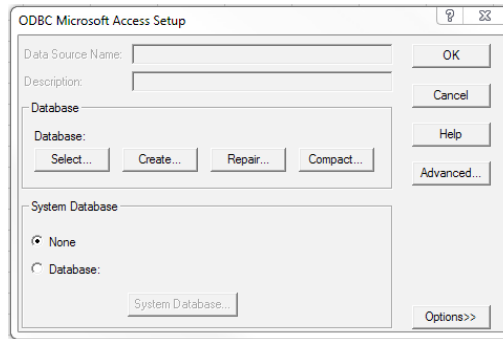
- ◆ Click the **[Connect]** button to establish a connection.



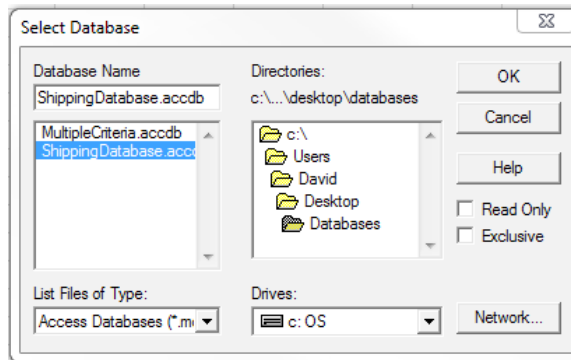
**Continued on next page**

# Importing Data Using Microsoft Query Connection, continued

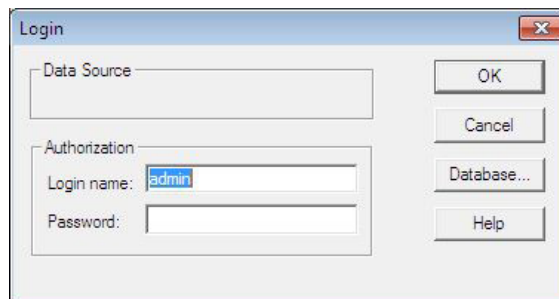
- Click on the [Select] button



- Browse to the location of the database and select the database you want to connect to. Click [OK].



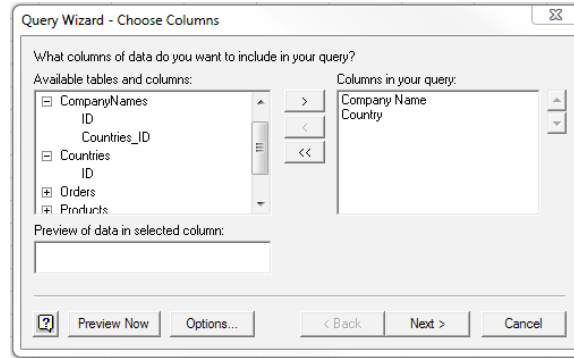
- You may be asked at this point to provide login credentials for the data source. Enter your login credentials and click [OK].



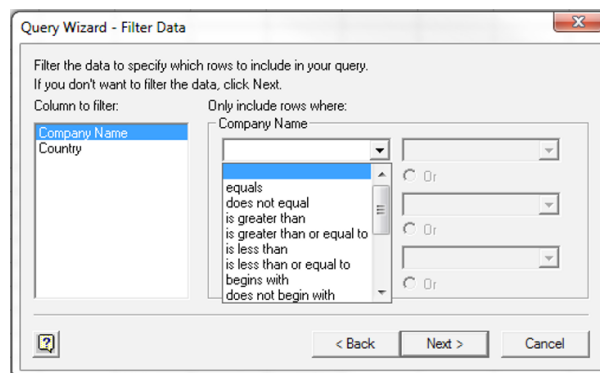
- Once this named connection is created, the *Query Wizard-Choose Columns* dialog box will open to allow you to choose the tables and the columns of information that you can include in your query.

**Continued on next page**

## Importing Data Using Microsoft Query Connection, continued



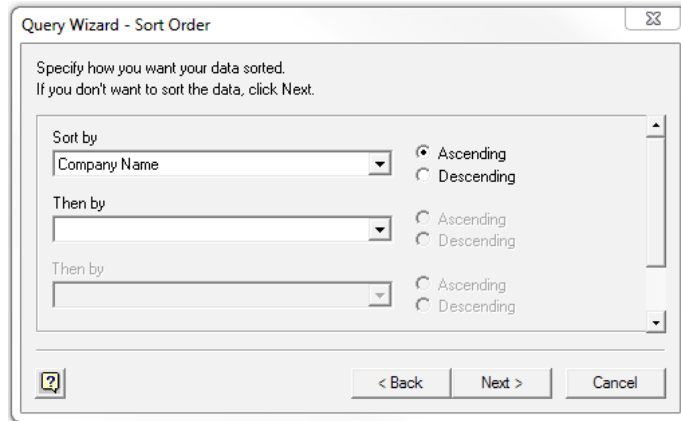
- ◆ Select the table you want to include in your query by clicking on the **[Expand]** button, **[+]**. Then, select the column of data you want to include in your query. Press the **[>]** to move your selection into the *Columns in your query* box.
- ◆ When you have selected all the columns you want to include in your query, click **[Next]**
- ◆ The *Query Wizard - Filter Data* dialog box is displayed. You can filter the data to extract specific information.
- ◆ Select from one of your *Column to filter:* and in the *Only include rows where:* drop-down use the search criteria to build your filter.
- ◆ Once you have made all of your selections, click **[Next]**.



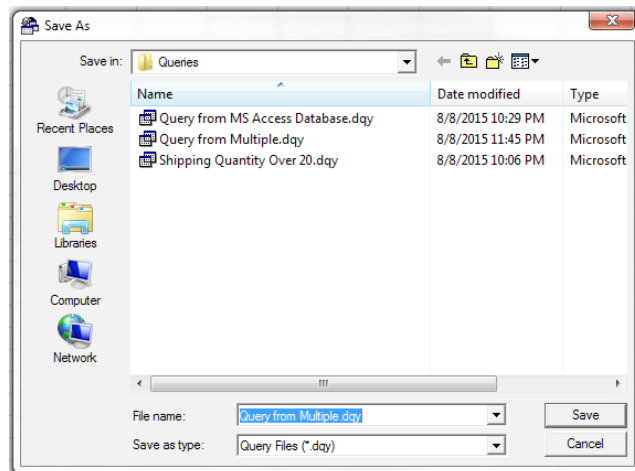
- ◆ The *Query Wizard - Sort Order* dialog box will open and offer you the option to sort your selected data. Select the drop-down under *Sort by* and choose **Ascending** or **Descending**.
- ◆ Once you have completed your selections, click **[Next]**.

**Continued on next page**

# Importing Data Using Microsoft Query Connection, continued



- ◆ The final step is the *Query Wizard - Finish* dialog box which offers you the options to **Return Data to Microsoft Excel** or **View Data** or **Edit Query in Microsoft Query** if you want to make any changes, and **Save Query** if you are going to use the query again.

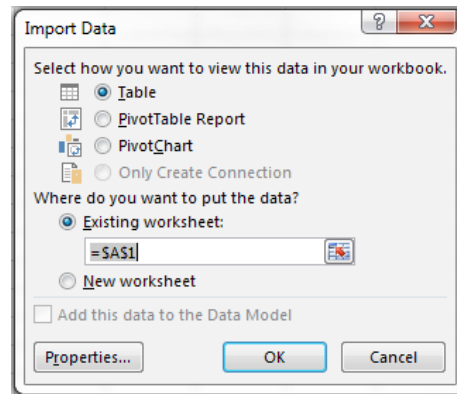


- ◆ Name the query if you are going to save it. You will see in the background the information the query is extracting from the table. Click **[Save]**.
- ◆ If you are selecting the option to **Return Data to Microsoft Excel**, Click **[Finish]**.

**Continued on next page**

## Importing Data Using Microsoft Query Connection, continued

You will now see the *Import Data* dialog box offering you the import options for your data, Click [OK].

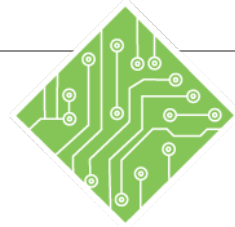


Your **Query** data will then appear in an Excel worksheet based on your selections in the dialog box.

	A	B	C	D
1	Company Name	Order ID	Order Date	Quantity
2	Around the Horn	10812	1/2/2007 0:00	40
3	Berglunds snabbköp	10812	1/2/2007 0:00	20
4	Blauer See Delikatessen	10428	1/28/2007 0:00	20
5	Bon app'	10908	2/26/2007 0:00	20
6	B's Beverages	10942	3/11/2007 0:00	28
7	Cactus Comidas para llevar	11010	4/9/2007 0:00	20
8	Chop-suey Chinese	10562	6/9/2007 0:00	20
9	Du monde entier	10655	9/3/2007 0:00	20
10	Eastern Connection	10727	11/3/2007 0:00	20
11	Franchi S.p.A.	10813	1/5/2007 0:00	35
12	Godos Cocina Típica	10851	1/26/2007 0:00	42

Excel table created from imported data

## Action 5.3 - Importing From External Data



### Instructions:

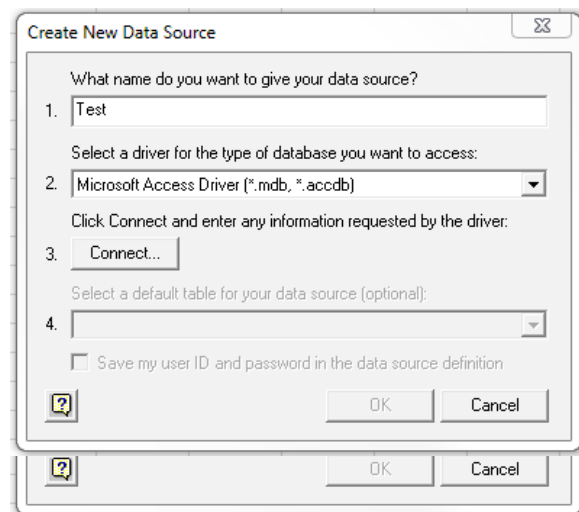
1. Open a blank workbook.
2. Select the *Data Tab*.
3. From the **Get External Data** group, click the **[From Other Sources]** button.
4. Select **From Microsoft Query**.
5. Make sure **<New Data Source>** is selected and click **[OK]**.
6. In the *Create New Data Source* dialog box, type **Test** for the name of the **Data Source**.
7. From the *Select a driver for the type of database you want to access*: drop-down list, select **[Microsoft Access Driver \*.mdb, \*.accdb]**.
8. Under *Click Connect and enter any information requested by the driver*:, click **[Connect]**
9. In the *ODBC Microsoft Access Setup* dialog box, under *Database*, click on **[Select]** and browse to select the database **ShippingDatabase.accdb**.
10. Click **[OK]** to close the *Select Database* dialog box.
11. Then, click **[OK]** in the *ODBC Microsoft Access Setup* dialog box to return to the *Create New Data Source* dialog box.
10. Under *Select a Default Table for Your Data Source (optional)* select the drop-down.
11. Do not make a selection. Click **[OK]**.

### Results/ Comments:

Offers options of connecting to a variety of databases to obtain information for analysis.

The *Choose Data Source* dialog box will open.

This ensures the necessary filter is used for Excel to interpret the data coming from the type of database you are connecting to.



Here, you can see the existing Access objects in this file from which you can extract information.

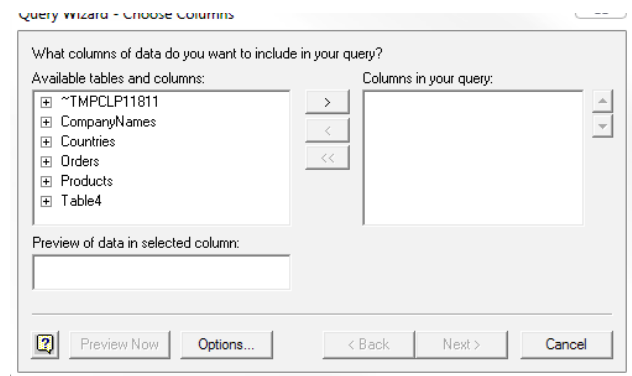


**Instructions:**

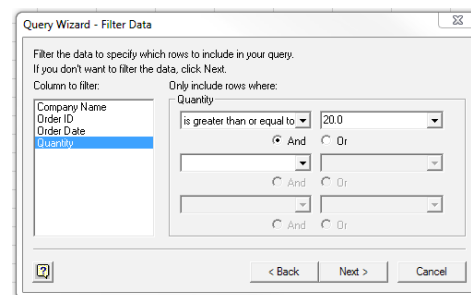
12. You may be prompted with a *Login Credentials* dialog box. If so, select **[OK]**.
13. Click **[OK]** to close the *Choose Data Source* dialog box.
14. Click the **[+]** to expand the **CompanyNames** table.
15. Select **CompanyName** and click the **[>]** arrow to move it into the *Columns in your query:* box.
16. Repeat steps 14 and 15 to move **OrderID**, **Order Date** and **Quantity**.
17. Click **[Next]**.
18. Select **Quantity** in the *Column to filter:* box, then select the drop-down under *Quantity* to **Only include rows where:** and choose **is greater than or equal to** and choose **20.0** from the next drop-down.
19. Click **[Next]**.
20. Select **[Next]** to skip the *Query Wizard-Sort Order* step.

**Results/ Comments:**

The *Query Wizard – Choose Columns* dialog box will open and display the *Available Tables and Columns* you can select to add to the *Columns in Your Query* to be imported into your Excel workbook.



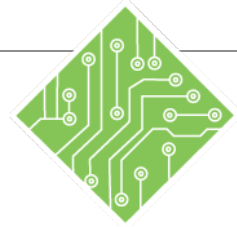
The *Query Wizard – Filter Data* dialog box will open and offer you the ability to filter the data imported by criteria you select.



The *Query Wizard-Sort Order* dialog box is displayed.

The *Query Wizard - Finish* dialog box is displayed.

## Action 5.3 - Importing From External Data, continued



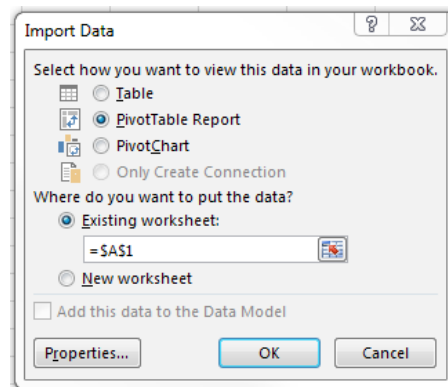
### Instructions:

- At this point, **Return Data to Microsoft Excel** should be selected in the *Query Wizard-Finish* dialog box.
- Click the **[Save Query]** button and name the query **Shipping Quantity Over 20**. Then click **[Save]**.
- Click **[Finish]** in the *Query Wizard-Finish* dialog box.
- Select **PivotTable Report** in the *Select how you want to view this data in your workbook*.
- Click **[OK]** to place the **PivotTable frame** in the existing worksheet starting at cell **A1**.
- Drag **Company Name** to the **Rows** area.
- Drag **Quantity** to the **Values** area.
- Save file as *External Query.xlsx*.

### Results/ Comments:

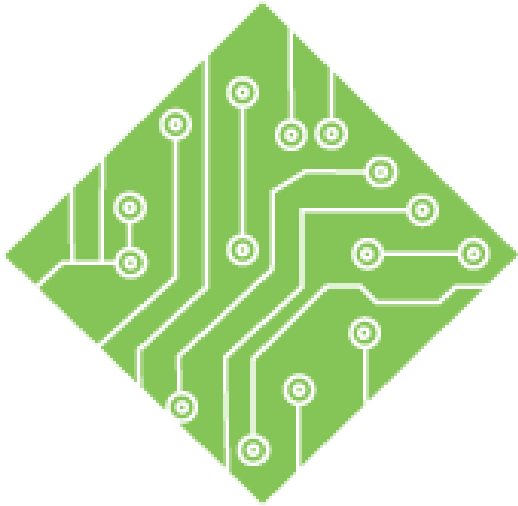
We will save the query so that we can re-run it if necessary.

The Import Data dialog box will open.



Your Pivot Report should look similar to this:

	A	B
1	Row Labels	Sum of Quantity
2	Around the Horn	40
3	Berglunds snabbköp	20
4	Blauer See Delikatessen	20
5	Bon app'	20
6	B's Beverages	28
7	Cactus Comidas para llevar	20
8	Chop-suey Chinese	20
9	Du monde entier	20
10	Eastern Connection	20
11	Franchi S.p.A.	35
12	Godos Cocina Típica	42
13	Gourmet Lanchonetes	30
14	Great Lakes Food Market	25
15	GROSELLA-Restaurante	40
16	Hanari Carnes	35
17	Hungry Coyote Import Store	24
18	Hungry Owl All-Night Grocers	40
19	Island Trading	25
20	Königlich Essen	70
21	La corne d'abondance	20
22	Let's Stop N Shop	40
23	LILA-Supermercado	20
24	Lonesome Pine Restaurant	21
25	Maison Dewey	20
26	Rancho grande	20
27	Rattlesnake Canyon Grocery	20
28	Richter Supermarkt	50
29	Simons bistro	40
30	Spécialités du monde	25
31	Split Rail Beer & Ale	30
32	The Big Cheese	30
33	Toms Spezialitäten	30
34	Tortuga Restaurante	24
35	Wartian Herkku	25
36	Wellington Importadora	24
37	White Clover Markets	50
38	Wilman Kala	50
39	<b>Grand Total</b>	<b>1113</b>

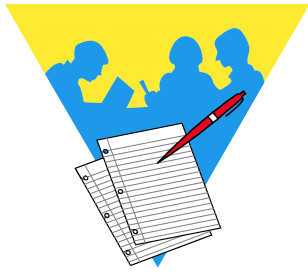


# Appendix A

## Lesson Overview

You will cover the following concepts in this chapter:

- ◆ Unlocking a Slicer
- ◆ Formatting Slicers
- ◆ Creating a Custom Slicer Style
- ◆ PivotTable Layout Options



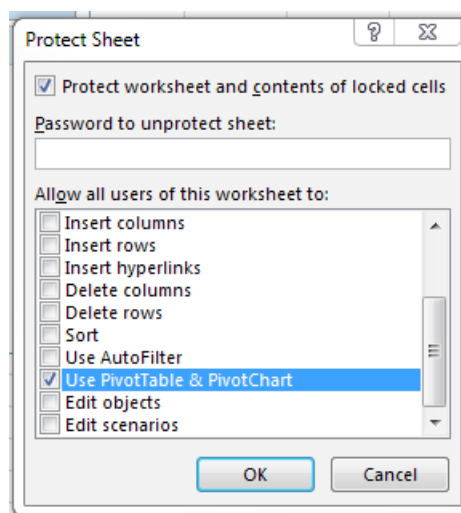
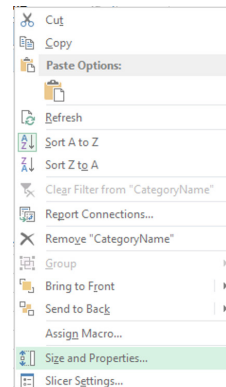
## Lesson Notes



## Unlocking a Slicer

## Unlocking a Slicer in a Protected Worksheet

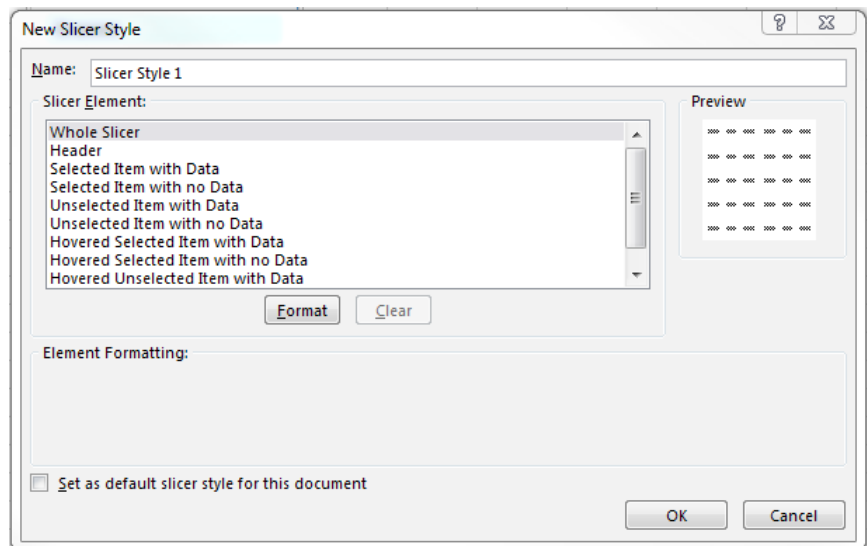
- ◆ Select the slicer(s) you wish the user to be able to manipulate.
- ◆ Right-click on a slicer and select **Size and Properties..** from the shortcut menu.
- ◆ In the **Task Pane** select **Properties.**
- ◆ Deselect the check box next to **Locked.**
- ◆ Click into the worksheet to deselect the **Slicer(s).**
- ◆ Click the *Review Tab*. In the **Changes** group, click on the **[Protect Sheet]** button.
- ◆ Click on the checkbox to **Allow all users of this worksheet to: Use PivotTable & PivotChart.**
- ◆ Click on the checkbox to **Allow all users of this worksheet to: Select unlocked cells.**



## Custom Slicer Styles

There are different ways to format your **Slicers** so that the user can see what values have been selected and applied. Using the **New Slicer Style** item from the **Slicer Styles Gallery** on the *Slicer Tools Options Tab*, you can change the way a button appears when hovered over or selected.

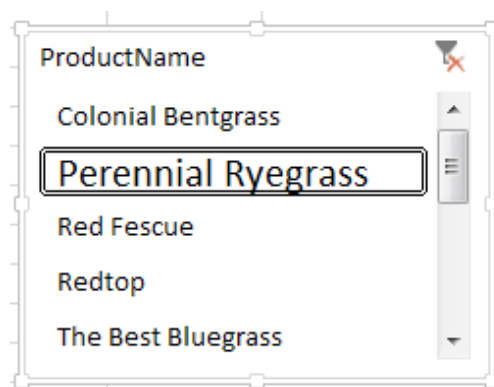
- ◆ Select the **Slicer** you would like to affect, or choose one and press **[Ctrl + A]** to select all of the **Slicers**.
- ◆ Click the *Options Tab*. Click on the **[More]** button on the **Slicer Styles Gallery**.
- ◆ Select **New Slicer Style**.
- ◆ Type in an appropriate name for your **Slicer Style** in the *Name:* text box.
- ◆ In the *New Slicer Style* dialog box, select one of the **Slicer Elements** in the list.
- ◆ Click on the **[Format]** button and select the formatting you would like to apply to that **Element**.
- ◆ Repeat the previous steps for all of the **Slicer Elements** you would like to change.
- ◆ To reuse the **Slicer Style** you just created, click on it in the **Custom** section of the **Slicer Style Gallery**.



## Custom Slicer Styles, continued

Some of the items that can be changed in a **Slicer Style** are:

- ◆ **Header** - This is the **Field Name** at the top of the **Slicer**.
- ◆ **Selected Item with Data** - This is a value in the **Slicer** that is *selected* and has associated data in the **PivotTable**, and therefore, the **PivotChart**.



- ◆ **Selected Item with no Data** - This is a value in the **Slicer** that is *selected* and does not have associated data in the **PivotTable** and **PivotChart**. An example is if you filter the **PivotTable** and **PivotChart** to show data for a certain month, but there were no sales of the selected **Product** on the **Slicer** in that month.
- ◆ **Unselected Item with Data** - This is a value in the **Slicer** which has corresponding data within the filter criteria, but has not yet been selected in the **Slicer**.
- ◆ **Unselected Item with no Data** - It is helpful to format this element when you wish to see items that do not have corresponding data within the filter criteria. Using the example above, you may format this element if you would like to see which **Products** do not have sales in that month before you even select them.
- ◆ **Hovered Selected Item with Data** - This is a value in the **Slicer** that has already been selected. However, you may wish to also see a format change when you pass your mouse pointer over the value.



## Custom Slicer Styles, continued

- ◆ **Hovered Selected Item with no Data** - This is a value that has been selected in the **Slicer** that does not have corresponding data in the **PivotTable** and/or **PivotChart**. When you pass your mouse pointer over this value, you may want to see a change in format.
- ◆ **Hovered Unselected Item with Data** - Change this element when you want a different format when you Pass your mouse pointer over a value that has not been selected, but *does* have corresponding data in the **PivotTable** and/or **PivotChart**.
- ◆ **Hovered Unselected Item with no Data** - Change the format of this element when you wish to emphasize, on hover, buttons which do not have corresponding data in the **PivotTable**. This way you can see which items will not produce a result when selected.

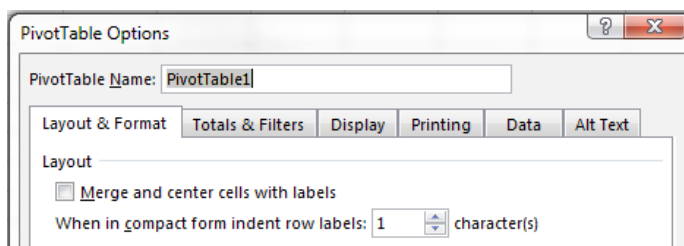


## PivotTable Layout Options

The [Report Layout] drop-down button in the **Layout** group of the *PivotTable Tools Design* ribbon will help you see the format that works best for you.

### Compact Form

In **Compact Form**, you can use the *PivotTable Options* dialog box from the [Options] button on the *PivotTable Tools Analyze Tab* to change the number of characters to indent the additional fields. This option lets you see multiple fields in one column.



### Outline Form

An **Outline Form** layout separates the row fields into separate columns. Use this view to show Row Item Labels separately.

### Tabular Form

The **Tabular Form** is the legacy format. Similar to the **Outline Form**, it shows the Row Labels in separate columns, but also includes separate rows for the **Totals**.

Row Labels
<b>Bulbs</b>
Anemone
Autumn crocus
Begonias
Daffodil
<b>Grasses</b>
Colonial Bentgrass
Creeping Bentgrass
Perennial Ryegrass
Red Fescue
Redtop
The Best Bluegrass
<b>Grand Total</b>

Compact Form

CategoryName	ProductName
<b>Bulbs</b>	Anemone
	Autumn crocus
	Begonias
	Daffodil
<b>Grasses</b>	Colonial Bentgrass
	Creeping Bentgrass
	Perennial Ryegrass
	Red Fescue
	Redtop
	The Best Bluegrass
<b>Grand Total</b>	

Outline Form

CategoryName	ProductName
<b>Bulbs</b>	Anemone
	Autumn crocus
	Begonias
	Daffodil
<b>Bulbs Total</b>	
<b>Grasses</b>	Colonial Bentgrass
	Creeping Bentgrass
	Perennial Ryegrass
	Red Fescue
	Redtop
	The Best Bluegrass
<b>Grasses Total</b>	
<b>Grand Total</b>	

Tabular Form



## PivotTable Layout Options, continued

### Repeat All Item Labels

In **Outline** or **Tabular** format, this option will fill in the blanks with the corresponding row labels. This is helpful when you want to copy and paste the data into a new spreadsheet for further analysis.

CategoryName	ProductName
Bulbs	Anemone
Bulbs	Autumn crocus
Bulbs	Begonias
Bulbs	Daffodil
<b>Bulbs Total</b>	
Grasses	Colonial Bentgrass
Grasses	Creeping Bentgrass
Grasses	Perennial Ryegrass
Grasses	Red Fescue
Grasses	Redtop
Grasses	The Best Bluegrass
<b>Grasses Total</b>	
<b>Grand Total</b>	

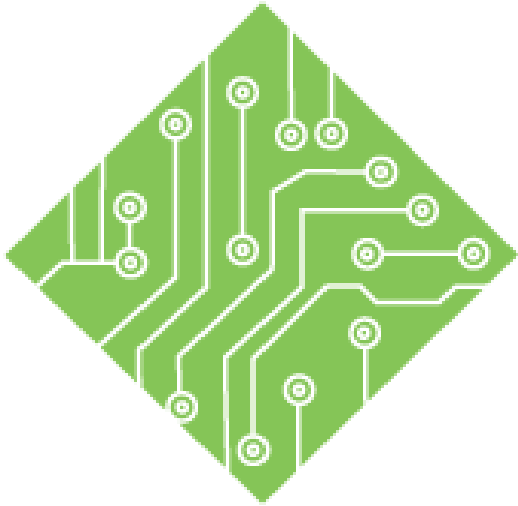
Repeat All Item Labels

### Changing the Display of Report Filters

Use the *PivotTable Options* dialog box to show the report filters in columns.

- ◆ Select the *PivotTable Tools Analyze* tab.
- ◆ Click on the [Options] button.
- ◆ Select the *Layout and Format* tab.
- ◆ Increase the number of **Report filter fields per column:**





# Appendix B

## Lesson Overview

You will cover the following concepts in this chapter:

- ◆ Eliminating Leading and Trailing Spaces
- ◆ Removing Blank Rows and Columns in Your Data

## Troubleshooting Data

### Leading and Trailing Spaces

Sometimes the data being used for your PivotTable does not summarize correctly. One reason for this is that there may be extra spaces in the data itself. This can happen when the data is imported from another database or application. Excel treats a space as a character, therefore, this data is considered separate pieces of information even though it looks the same in the spreadsheet. This issue can be resolved with the Trim function.

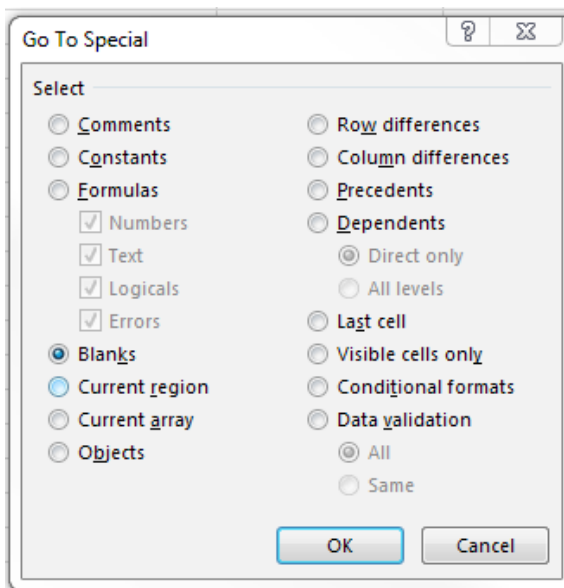
### The TRIM Function

In the datasheet, click into a blank cell or create a “dummy” column to create the formula.

- ◆ Type =**TRIM**(reference cell)
- ◆ Fill the formula down to the rest of the cells in the column.
- ◆ Copy the cells just created.
- ◆ Paste the values back to the original column.
- ◆ Refresh the **PivotTable**.

### Selecting Blank Rows/Columns for Elimination

- ◆ Click on the *Home Tab*, then select the **[Find & Select]** button in the **Editing** group.
- ◆ Click on **Go To Special...** to open the *Go To Special* dialog box
- ◆ Select the **Blanks** option button and click **[OK]**.

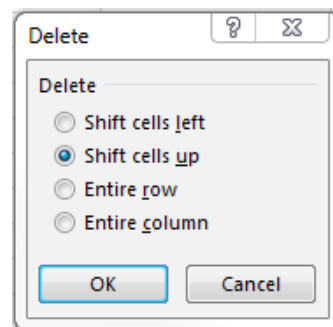


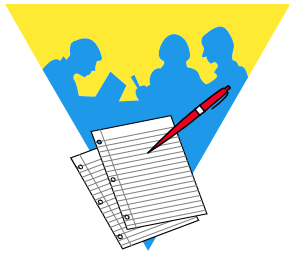
## Troubleshooting Data, continued

**Note**

Press **[Ctrl + -]** to open the *Delete* (cells) dialog box.

- ◆ Delete the cells using the *Delete* (cells) dialog box from the **[Delete]** button on the *Home Tab*.





## Tips and Notes

