The Company Rocks

Excel 2003 PivotTables Summarizing, Analyzing, and Presenting Your Data

Step-by-step instructions to accompany video lessons

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Creating PivotTables in Excel 2003

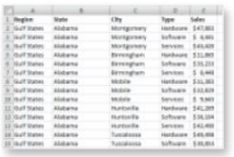
PivotTables are the most powerful tool available in Excel. At the same time, a PivotTable is one of the easiest Excel tools to use! In fact, you can create your first PivotTable with fewer than 10 mouse clicks.

How is this possible?

Rather than explain PivotTable theory, let me show you how to create your first PivotTable.

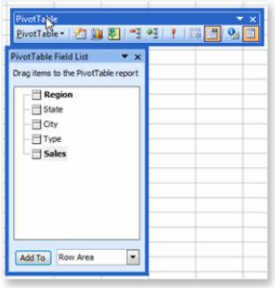
Follow these steps:

1) Begin with a data set that has:
   a. Clearly defined Field Headers – e.g. Apply **Bold** formatting to the labels in the top row of your data set.
   b. The same category of data in each Column (field)of the data set. For example, include only telephone numbers in a field labeled "**Phone**."
   c. No blank rows and no blank columns in the data set. The limits of your data set are defined by the first blank row and the first blank column.

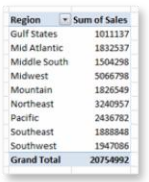


2) Select one cell in the data set, go to the Data Menu and select PivotTable and PivotChart Report Wizard. This is a three-step process.
3) Because we have verified our data set and have selected a single cell in the data set, we could click Finish to accept the default settings for the Pivot Table:
   a. The Range of data for your PivotTable is the data set that we verify in Step 2.
   b. The PivotTable will be created on a new, blank worksheet.

4) On the new Excel worksheet, look at the PivotTable Field List, the PivotTable Tool Bar and the PivotTable Template Grid. On the PivotTable Grid there are four "Drop Areas. Select a field from the PivotTable Field List and "drag and drop it" in one of these four drop areas on the PivotTable template grid:
   a. Row Area
   b. Column Area
   c. Data Area
   d. Page Area



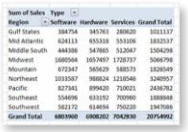
5) Let's begin by dragging the "Region" field to the Row Area. Each of the unique values from the Region field now appears on the PivotTable.
6) Next, drag the "Sales" field on to the Data Area. We now have a Subtotal for each Region. By default, if the field contains numeric values Excel uses the SUM function to "Subtotal" this field.
   a. Notice that in the Pivot Table that "Sum of Sales" is the label for the new field and that the sales for each region have been Subtotaled. A "Grand Total has also been added.



Region	Sum of Sales
Gulf States	1011137
Mid Atlantic	1832537
Middle South	1504298
Midwest	5066798
Mountain	1826549
Northeast	3240957
Pacific	2436782
Southeast	1888848
Southwest	1947086
Grand Total	20754992

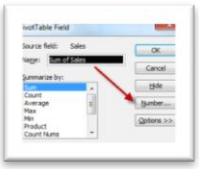
b. The subtotaled numbers are not formatted – as they were in the original data set. I will show you how to format numbers in a PivotTable field later in this lesson.

7) One way to place the "Type" field in the Column Area is to use the "Add to" drop down menu at the bottom of the PivotTable Field list.
   a. Notice that each of the values in the "Type" field appears in the top row – going horizontally across – of the PivotTable. A new "Grand Totals" Column appears for each row of the PivotTable.
   b. Notice that the Subtotal Amount in the Grand Totals for each Region matches the number from the previous step. Now, in addition, you see Subtotals for the "cross-tabulation" of each Region and Type!



At this point, the PivotTable has performed several sophisticated calculations – on its own! We have not been asked to create a single formula! This shows you the power – and the simplicity – of a PivotTable.

8) Now that we have the basic PivotTable set up. It is time to learn how to "Format Numbers" in a PivotTable.
   a. Right-mouse-click any number in the PivotTable. From the shortcut menu, select "Field Settings."
   b. In the dialog box, select the "Number" Button. This opens a familiar dialog box where you select the Number Type, Symbol and number of decimal places that you want for each numeric summary in your Pivot Table.



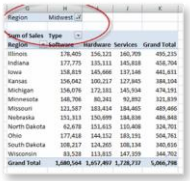
In a PivotTable, you format "a Field." In an Excel Worksheet, you format "a cell." This is an important distinction as you will see later in this lesson. Because you can "pivot" – or rearrange – the display of fields in a PivotTable, you do not apply formatting to a specific cell – as in an Excel worksheet. Rather, you format the field so that the formatting will remain in place when you change the orientation of that field from – e.g. a Row to a Column Label or vice versa.

Sum of Sales	Type			
Region	Software	Hardware	Services	Grand Total
Gulf States	384,754	345,763	280,620	1,011,137
Mid Atlantic	624,113	655,318	553,106	1,832,537
Middle South	444,386	547,865	512,047	1,504,298
Midwest	1,680,564	1,657,497	1,728,737	5,066,798
Mountain	672,347	565,629	588,573	1,826,549
Northeast	1,033,587	988,824	1,218,546	3,240,957
Pacific	827,341	899,420	710,021	2,436,782
Southeast	554,696	633,192	700,960	1,888,848
Southwest	582,172	614,694	750,220	1,947,086
Grand Total	6,803,960	6,908,202	7,042,830	20,754,992

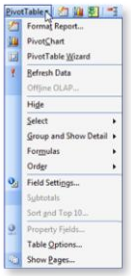
So there you have it – you have created your first PivotTable with fewer than 10 mouse clicks!

You can now discover the "information" that might be hidden inside the rows and rows of records - 840 in this example – of your data set. And, you are just beginning to scratch the surface of what is "possible" with a PivotTable! For example, you can now:

- Use the drop-down filters to focus your attention to specific region(s) or particular Type(s) of products sold.
- Take advantage of the "Page Area." For example, by moving the "Region" field to the Page Area and adding the "State" field to the "Row Area," you have now created a very different – and valuable – PivotTable view of your data set.



PivotTable Toolbar

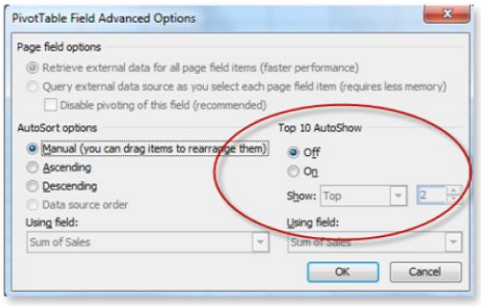


The most popular PivotTable command buttons are on the "floating" PivotTable Toolbar. Notice, that there is a "drop-down" menu on the Toolbar. If you wish, you can "dock" the toolbar along the sides, the bottom or the top of your screen. Remember that the PivotTable must be "active" in order to use the commands on the Toolbar.

Filtering Fields in Excel 2003 PivotTables

You can quickly filter your PivotTable Fields to focus on the records that you are most interested in. When you place a field in either the Row Area or the Column Area, a drop-down filter menu is automatically added. The filter will remain in place if you decide to move it to another area (Row, Column, Page).

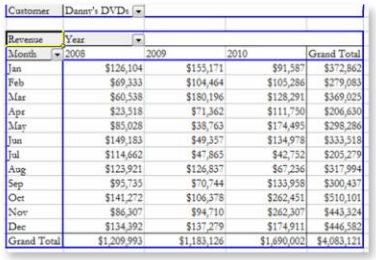
Top 10 AutoShow Filters



"Top 10" is a generic name. You can show any number of Top or Bottom records in your PivotTable.

- Double click a Field Label in your PivotTable to open the Field Dialog Box.
- Click the "Advanced" button to turn on / turn off the Top 10 AutoShow.
- Remember that you want to see the "Top 10" items (records) based on e.g. Sum of Products.

Page Area Filters

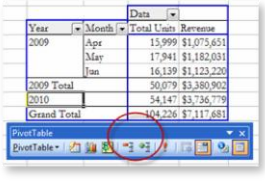


Customer	Danny's DVDs			
Revenue	Year			
Month	2008	2009	2010	Grand Total
Jan	$126,104	$155,171	$91,587	$372,862
Feb	$69,333	$104,464	$105,286	$279,083
Mar	$60,538	$180,196	$128,291	$369,025
Apr	$23,518	$71,362	$111,750	$206,630
May	$85,028	$38,763	$174,495	$298,286
Jun	$149,183	$49,357	$134,978	$333,518
Jul	$114,662	$47,865	$42,752	$205,279
Aug	$123,921	$126,837	$67,236	$317,994
Sep	$95,735	$70,744	$133,958	$300,437
Oct	$141,272	$106,378	$262,451	$510,101
Nov	$86,307	$94,710	$262,307	$443,324
Dec	$134,392	$137,279	$174,911	$446,582
Grand Total	$1,209,993	$1,183,126	$1,690,002	$4,083,121

Rather than filter a PivotTable field, you can place one or more fields in the Page Area. Now, you can choose to filter your complete PivotTable Report; to create a Data Dashboard Report.

Tip: Once you have at least one field in the Report Filter Drop Area, you can take advantage of the Option to "Show Report Pages." This will quickly create a new worksheet tab for each item in the Report Filter Field. This is a great time saver!

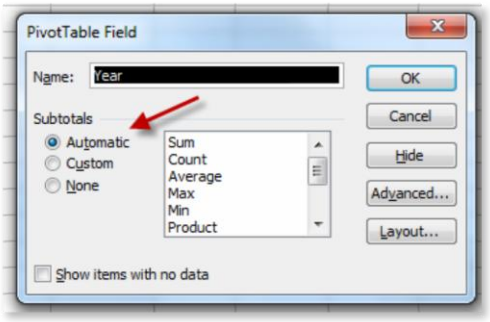
Hide / Show Detail Filters



Another way to "filter" your PivotTable is to take advantage of the Hide or Show Detail Command Buttons on the PivotTable Toolbar. You can Hide /

Show the Details for the entire field or select individual vales – e.g. Year 2009 and 2010. Pay attention to the "active cell" in your PivotTable when you select either command button.

Subtotals and Grand Totals

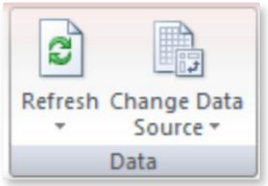


You can control the type(s) of Subtotal that you wish to see in a field. Double click the Field Label in your PivotTable to open the Field Dialog Box. Chose from Automatic, Custom or None. If you select Custom, you can have multiple Subtotals (Sum, Average, Count, etc.) appear at the bottom of each field.

You control Grand Totals from the PivotTable Options dialog box. You can show or hide Grand Totals for either the Rows or the Columns.

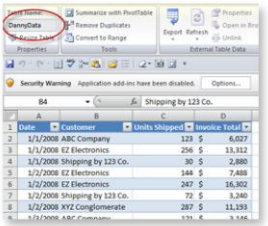
Changing Data Source and Refreshing Your PivotTable

A PivotTable takes a "snapshot" of your source data and stores it in a Pivot Cache – in memory. This is why your PivotTable is able to redraw and recalculate so quickly. However, when you change the dimensions of your source data by adding additional rows and columns or updating the records, your PivotTable does not automatically update.



If you have added columns and / or records to your source data, you will need to return to Step 2 of the PivotTable Wizard. Use the PivotTable Toolbar Menu to "go backwards" in the Wizard. Change the dimensions of your Data Source in Step 2 and then click Finish. You will still need to click the Refresh Data Command (the Red Exclamation Mark) before you see the changes in your PivotTable.

If you make any changes to your source data set, you will need to click the Refresh command button in order to see these changes reflected in your PivotTable.

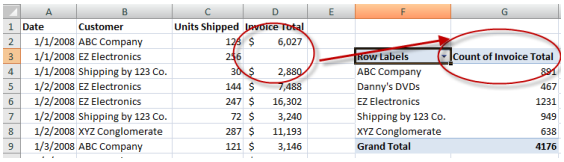


Tip: Format your source dataset as an Excel 2003 List. You can use the keyboard shortcut Ctrl + L or go to the Data Menu and chose List – Create List. Now, as the dimensions of your list expand or contract, it is very easy to refresh your PivotTable. E.g. You can copy and paste to append additional records to your List and your PivotTable will automatically recognize that the source data for your Pivot Table has changed. Of course, you still need to click the Refresh Data Command Button to update your PivotTable.

Changing PivotTable Summary Calculations

The Default Settings for the PivotTable Data Area are:

- Use SUM Function to Subtotal fields with all numeric values
- Use Count Function to Subtotal fields with text values



	A	B	C	D	E	F	G
1	Date	Customer	Units Shipped	Invoice Total			
2	1/1/2008	ABC Company	123	$ 6,027			
3	1/1/2008	EZ Electronics	256			Row Labels	Count of Invoice Total
4	1/1/2008	Shipping by 123 Co.	30	$ 2,880		ABC Company	891
5	1/2/2008	EZ Electronics	144	$ 7,488		Danny's DVDs	467
6	1/2/2008	EZ Electronics	247	$ 16,302		EZ Electronics	1231
7	1/2/2008	Shipping by 123 Co.	72	$ 3,240		Shipping by 123 Co.	949
8	1/2/2008	XYZ Conglomerate	287	$ 11,193		XYZ Conglomerate	638
9	1/3/2008	ABC Company	121	$ 3,146		Grand Total	4176

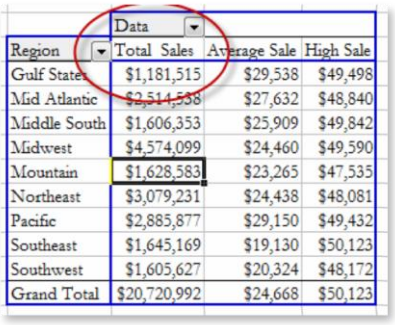
Tip: Pay attention to the function used when you add a field to the Values Area. Having even a single blank cell in a numeric field will result in the Count Function rather than the Sum Function in your PivotTable!

Changing the Summarize Function

There are several ways to change the Function that you use to Subtotal a field. Each will take you to the Field Settings Dialog Box.

Additional Subtotals

You can add the same field more than once to the Data Area of your PivotTable. So, for example, you could Sum, Average and Count the same field.



	Data		
Region	Total Sales	Average Sale	High Sale
Gulf States	$1,181,515	$29,538	$49,498
Mid Atlantic	$2,514,538	$27,632	$48,840
Middle South	$1,606,353	$25,909	$49,842
Midwest	$4,574,099	$24,460	$49,590
Mountain	$1,628,583	$23,265	$47,535
Northeast	$3,079,231	$24,438	$48,081
Pacific	$2,885,877	$29,150	$49,432
Southeast	$1,645,169	$19,130	$50,123
Southwest	$1,605,627	$20,324	$48,172
Grand Total	$20,720,992	$24,668	$50,123

Once you add more than one Data Summary to your PivotTable, a new Field Label – "Data" – is added. You can position this in either the Row Area or the Column Area.

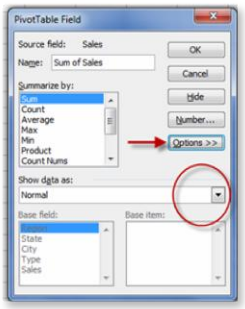
Create Meaningful Names for Summaries

- In Field Settings, create a custom name for your summary.
- To avoid an "error" with your custom name, add a "Space" at the end of name.
- Change the Number Format for each field to fit your summary.

Use Show Data As Calculations

In the Field Settings Dialog Box there are two sections:

- Summarize by
- Show data as



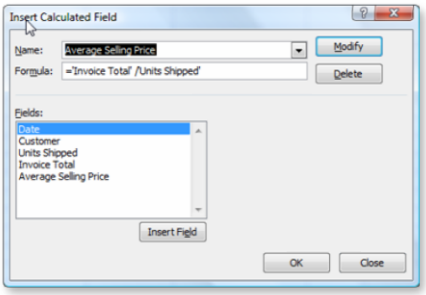
When you select the Show data as drop-down menu, you can select from these calculation options:

- Normal
- Difference From
- % Of
- % Difference From
- Running Total In
- % of row
- % of column
- % of total
- Index

Some of these calculations are obvious – e.g. % of row and % of column. These are easy to verify because either the row or the column must add up to 100%. Others – e.g. Difference From and Running Total In require additional information – from the dialog box – to give you the correct result.

Creating Calculated Fields

In a PivotTable, a Calculated Field is a Virtual Field. This field does not reside in the data source for the PivotTable. For example, you could create a Calculated Field titled "Average Selling Price" by writing this formula: 'Invoice Total' / 'Units Shipped.'

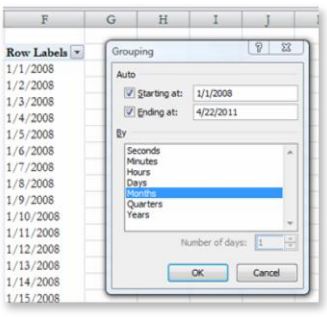


Calculated Fields must reside in the Data Area of your PivotTable. You open up the Calculated Field Dialog Box by clicking Formulas – Calculated Field from the PivotTable Toolbar Menu. If you need to edit a Calculated Field, you use the drop-down menu next to the "Name" of the Calculated Field. You can also delete a Calculated Field from this same menu.

Tip: You may also notice that you can create a Calculated Item for your PivotTable. I strongly suggest that you avoid Calculated Items because they can easily result in a "double calculation." My preference is that you "Group by Selection" – a technique that you will learn in the next section.

Grouping Fields in PivotTables

With about 6 clicks of the mouse, you can create a Month, Quarter, Year report from a field that contains a series of daily transactions. To do so, select a single cell in the PivotTable field and from the Toolbar Menu select "Group and Show Detail - Group." As a best practice, it is wise to select both the month and the year when grouping by field – unless you want to create a seasonality report that spans multiple years.



To create a Grouping by week, select "By Days" and then set the "Number of days" to 7. Consult a calendar to set your beginning week date to either a Sunday or a Monday – or any other selection of your choice.

Notice, that if you Group by Month, Quarter and Year, you now have two additional "virtual" / "calculated" fields in the Field List. You can place them in the Row, Column or Report Filter drop zones as you wish.

Avoid Calculated Items - Use Group by Selection Instead

In addition to "Grouping by Field," you can choose to "Group by Selection." In this case, you select the values that you wish to include in your selection and then choose "Group and Show Detail - Group." This creates a subset of your Pivot Table field and it avoids the potential "double calculation" effect when you create a "Calculated Item."

Creating PivotCharts

A PivotChart – a Chart based on, and linked to, a PivotTable – is a powerful way to present the information that resides in your data source.

Your PivotChart is "tied to" your PivotTable. Any changes that you make to the layout or the filtering in either the Chart or the Table are immediately reflected in both the PivotTable and the PivotChart!

The PivotChart Filters the PivotTable Field list work "hand in hand." You can use either one to make changes to both your PivotChart and your PivotTable.

Location of PivotChart

You can decide where you prefer to place your PivotChart – embedded on the worksheet that displays your PivotTable or on a separate Chart Sheet. You can change locations as often as you wish. Right Click on your PivotChart and select Location. Use the Pivot Table Wizard to change the location of the PivotTable.

You can use the Chart Wizard Command on the PivotTable Toolbar to make changes to your PivotChart. You can change the Type of Chart, the Formatting of any Chart Element, the Size and the Location of your Pivot Chart.

Personally, I prefer to have my PivotChart and my PivotTable on the same worksheet while I am building my chart. I find it easier to add and rearrange the Fields on the PivotTable. You can use most, but not all, Excel Chart Types for your PivotChart. You can use all of the chart formatting tools that you can use for a standard Excel chart.

This concludes the "premium" lesson, "Summarizing, Analyzing & Presenting your Data in Excel 2003 Pivot Tables." My goal was to demonstrate how easy it is to create, modify and copy a Pivot Table in Excel 2007. You should now be able to answer these questions:

- What is a PivotTable?
- How do I create a PivotTable?
- How can I modify – or customize – my PivotTable Report?
- How can I Filter my PivotTable Report? What Filter Options are available?
- How can I Change the Source Data for my PivotTable; Refresh my PivotTable?
- How can I Change or Add Additional PivotTable Summaries?
- How can I add a Calculated Field to my PivotTable Report?
- How can I Group Pivot Table Fields – e.g. by Month, Quarter & Year?
- What is the advantage to Grouping by Selection rather than creating a Calculated Item?
- How can I create a PivotChart that is linked to my PivotTable Report?

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