

# MS Excel 2007 – Pivot Tables

## 1. Introduction:

### Getting Started with Excel Pivot Tables

The first step in creating an Excel Pivot Table is to organize your data in a list of rows and columns. In Excel 2007, you can format this list as an Excel Table, and use that as the dynamic source for your Excel Pivot Table

### Use a Dynamic Data Source

You can use a dynamic formula to define the source range for an Excel Pivot Table. As new items are added to the table, the named range will automatically expand.

You can download the zipped sample Excel Pivot Table file used for this pivot table tutorial.

#### 1. Name the Range

1. Choose Insert>Name>Define
2. Type a name for the range, e.g. **Database**
3. In the Refers To box, enter an Offset formula that defines the range size, based on the number of items in a column that doesn't contain any blank cells. , e.g.:

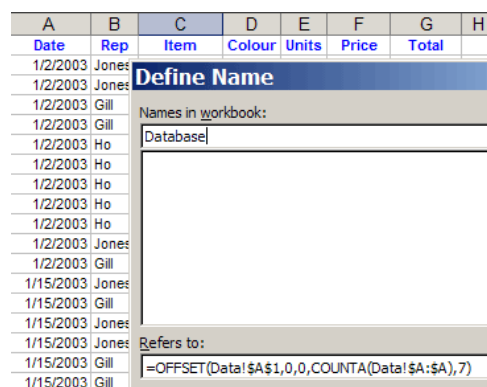
**=OFFSET(Data!\$A\$1,0,0,COUNTA(Data!\$A:\$A),7)**

In this example, the list is on a sheet named 'Data', starting in cell A1. The arguments used in this Offset function are:

1. Reference cell: **Data!\$A\$1**
2. Rows to offset: **0**
3. Columns to offset: **0**
4. Number of Rows: **COUNTA(Data!\$A:\$A)**
5. Number of Columns: **7**

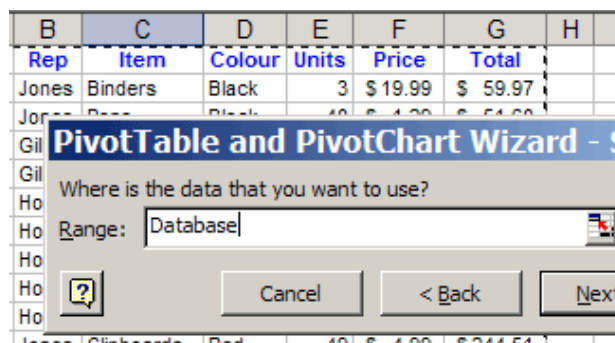
**Note:** for a dynamic number of columns, replace the **7** with: **COUNTA(Data!\$1:\$1)**

4. Click OK



## 2. Base the Pivot Table on the Named Range

1. Select a cell in the database
2. Choose Data>PivotTable and PivotChart Report
3. Select 'Microsoft Excel List or Database', click Next.
4. For the range, type your range name, e.g. Database
5. Click Next
6. Click the Layout button
7. Drag field buttons to the row, column and data areas
8. Click OK, click Finish

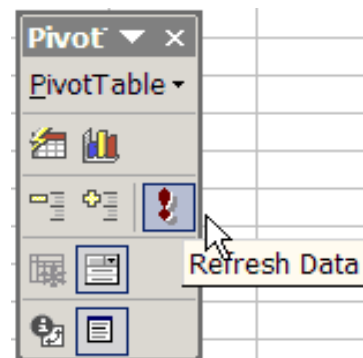


## 2. Clear Old Items:

### Manually Clear Old Items

To manually clear the old items from the list:

1. If you manually created any groups that include the old items, ungroup those items.
2. Drag the pivot field out of the pivot table.
3. On the Pivot toolbar, click the Refresh button
4. Drag the pivot field back to the pivot table



### Change the Retain Items Setting in Excel 2007

To prevent old items from being retained in an Excel 2007 pivot table, you can change an option setting:

1. Right-click a cell in the pivot table
2. Click on PivotTable options
3. Click on the Data tab
4. In the Retain Items section, select None from the drop down list.
5. Click OK, then refresh the pivot table.

### 3. Introduction:

#### Preparing Your Pivot Table Data

Before you create a pivot table, make sure your data is organized correctly. There are instructions on the following pages, for setting up your source data in a table, organized into rows and columns.

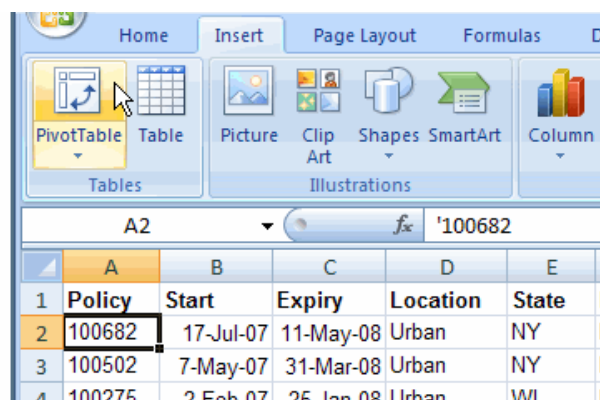
In this example the source data contains information about property insurance policies. Each row has the details about one insurance policy, such as the region, state, construction type and the value of the insured property.

	A	B	C	D	E	F	G	H	I	J	K
1	Policy	Start	Expiry	Location	State	Region	InsuredValue	Construction	BusType	EQ	Flood
2	100682	17-Jul-07	11-May-08	Urban	NY	East	\$ 62,550,000	Fire Resist	Apartment	Y	Y
3	100502	7-May-07	31-Mar-08	Urban	NY	East	\$ 57,343,200	Fire Resist	Office Bldg	Y	Y
4	100275	2-Feb-07	25-Jan-08	Urban	WI	Midwest	\$ 53,410,614	Frame	Construction	Y	Y
5	100625	27-Jun-07	7-Apr-08	Urban	NY	East	\$ 49,837,500	Fire Resist	Apartment	Y	Y
6	100342	3-Mar-07	13-Jan-08	Urban	NY	East	\$ 39,642,500	Fire Resist	Apartment	Y	Y
7	100574	8-Jun-07	25-Mar-08	Urban	VT	Northeast	\$ 37,785,000	Frame	Apartment	Y	Y
8	100754	10-Aug-07	29-May-08	Urban	NY	East	\$ 36,909,180	Metal Clad	Manufacturing	Y	Y
9	100498	3-May-07	6-Feb-08	Urban	NJ	East	\$ 36,356,000	Fire Resist	Apartment	Y	Y
10	100678	15-Jul-07	21-Apr-08	Urban	WI	Midwest	\$ 35,245,000	Masonry	Apartment	Y	Y
11	100596	18-Jun-07	28-Mar-08	Rural	MI	Central	\$ 34,841,710	Metal Clad	Manufacturing	Y	Y
12	100214	5-Jan-07	23-Oct-07	Urban	NY	East	\$ 33,250,000	Frame	Apartment	Y	Y
13	100428	7-Apr-07	13-Jan-08	Urban	NJ	East	\$ 33,000,000	Fire Resist	Service	Y	Y
14	100957	5-Nov-07	5-Nov-08	Urban	NY	East	\$ 31,285,000	Frame	Office Bldg	Y	Y
15	100741	5-Aug-07	5-Jun-08	Urban	NY	East	\$ 31,265,600	Fire Resist	Apartment	Y	Y

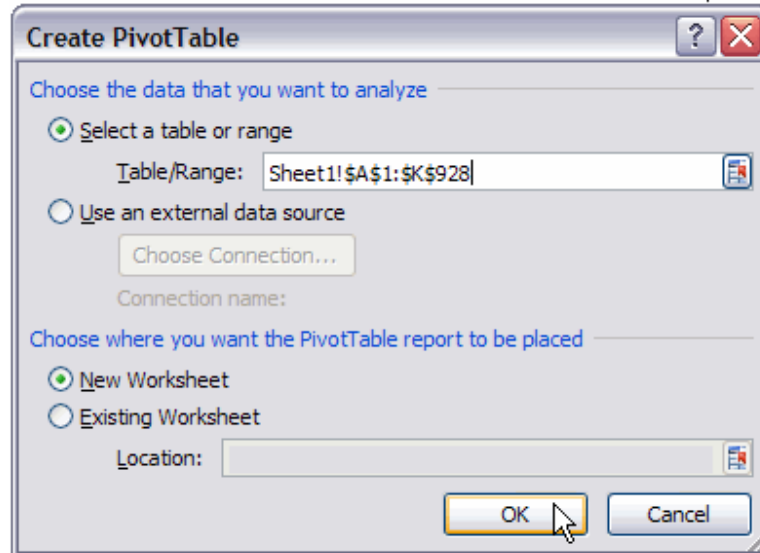
#### Creating a Simple Pivot Table

After your source data is prepared, you can create a pivot table. We'll create a pivot table that shows the total insured value in each of the four regions where we sell insurance.

1. Select any cell in the source data table
2. On the Ribbon, click the Insert tab
3. In the Tables group, click PivotTable



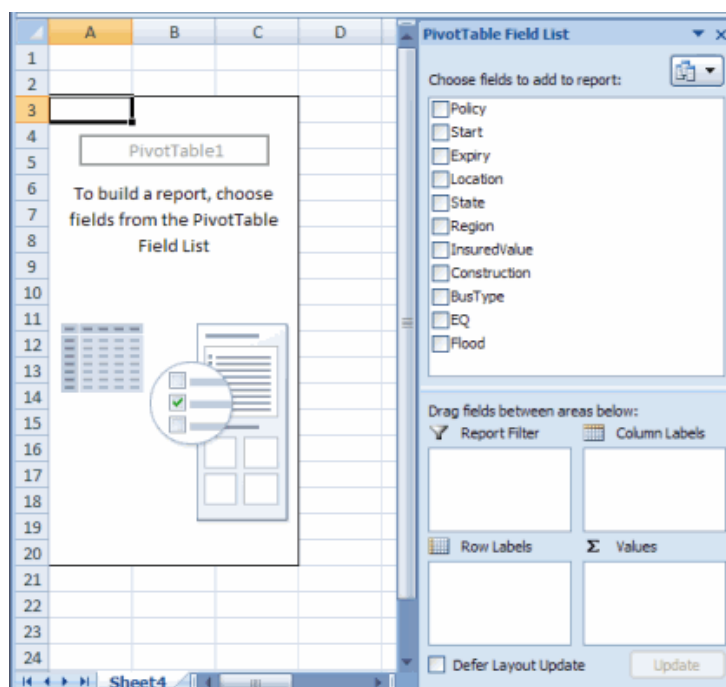
- In the Create PivotTable dialog box, the address of your source data table should be automatically entered in the Table/Range box. If not, click on the worksheet, and select the range manually



- Next, select New Worksheet or Existing Worksheet as the location for your pivot table, then click OK

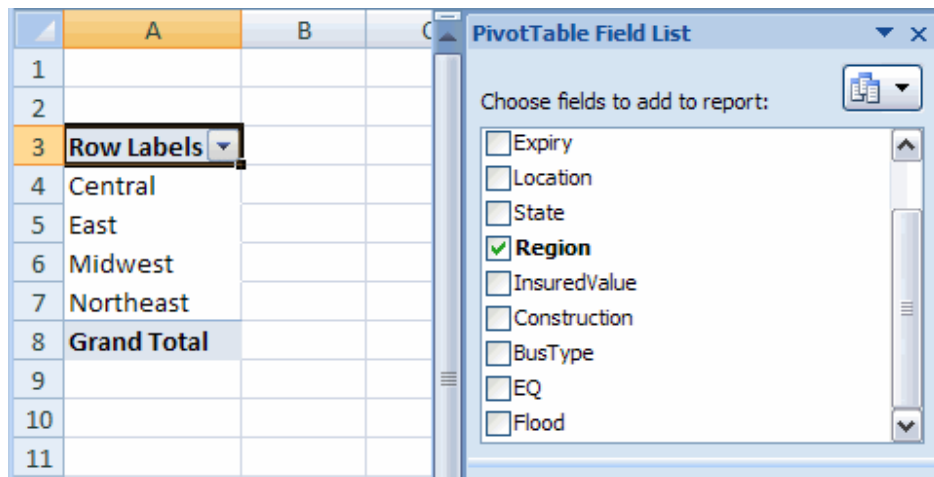
### **Adding Fields to the Pivot Table**

An empty pivot table is created in your workbook, either on a new sheet, or the existing sheet that you selected. When you select a cell within the pivot table, a PivotTable Field List appears, at the right of the worksheet.



We want to see the total insured value in each of the four regions, so we'll add the Region and Insured Value fields to the pivot table.

1. In the PivotTable Field List, add a check mark to the Region field. The Region field is automatically added to the pivot table, in the Row Labels area.



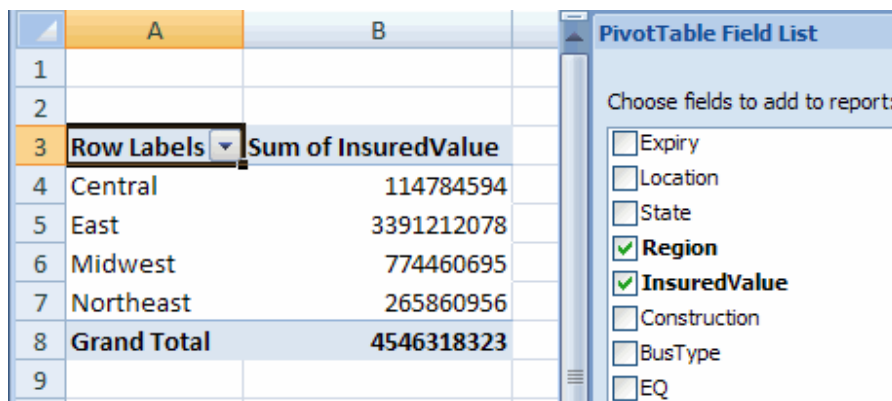
	A	B
1		
2		
3	Row Labels	
4	Central	
5	East	
6	Midwest	
7	Northeast	
8	Grand Total	
9		
10		
11		

**PivotTable Field List**

Choose fields to add to report:

- ☐ Expiry
- ☐ Location
- ☐ State
- ☒ **Region**
- ☐ InsuredValue
- ☐ Construction
- ☐ BusType
- ☐ EQ
- ☐ Flood

2. Add a check mark to the Insured Value field, and it will be automatically added to the Values area. You can now see the total insured value in each region.



	A	B
1		
2		
3	Row Labels	Sum of InsuredValue
4	Central	114784594
5	East	3391212078
6	Midwest	774460695
7	Northeast	265860956
8	Grand Total	4546318323
9		

**PivotTable Field List**

Choose fields to add to report:

- ☐ Expiry
- ☐ Location
- ☐ State
- ☒ **Region**
- ☒ **InsuredValue**
- ☐ Construction
- ☐ BusType
- ☐ EQ

## Modifying the Pivot Table

After you've created a pivot table, you can add more fields, remove fields, or move the fields to a different location in the pivot table layout. We'll remove the Region field, and add the Location field, to see the value of Rural policies compared to Urban.

1. To remove the Region field, click on its check box, to remove the check mark
2. To add the Location field, click on its check box, to add a check mark

The pivot table now shows the totals for Rural and Urban locations.

	A	B
1		
2		
3	Row Labels	Sum of InsuredValue
4	Rural	564336391
5	Urban	3981981932
6	Grand Total	4546318323
7		
8		

**PivotTable Field List**  
  
Choose fields to add to report  
☐ Expiry  
☒ Location  
☐ State  
☐ Region  
☒ InsuredValue  
☐ Construction  
☐ BusType

#### 4. Custom Calculations:

In an Excel Pivot Table, you can summarize the data by using the values in other cells in the data area.

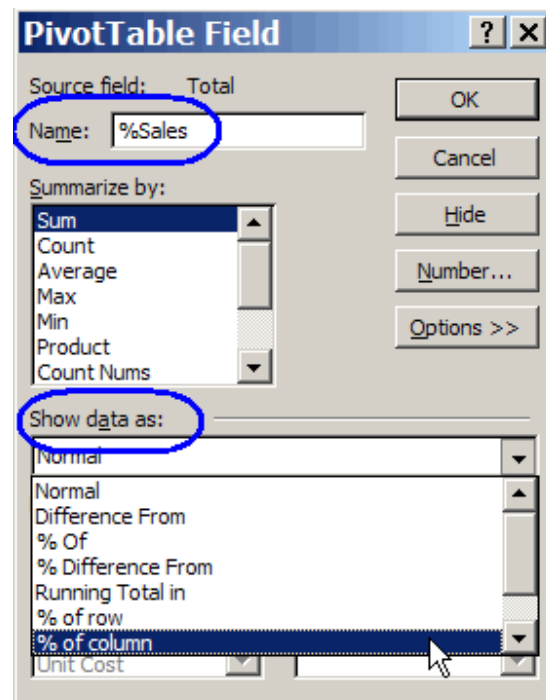
For example, you can show each Region's total as a percentage of the national total. Or, calculate the difference between the sales totals for the current year, and the sales totals for the previous year. The examples shown in this Excel pivot table tutorial are based on this zipped sample file .

Rep	(All)	
	Data	
Region	Sales	% of Sales
Alberta	2486.72	12.67%
Ontario	11139.07	56.75%
Quebec	6002.09	30.58%
Grand Total	19627.88	100.00%

#### % of Column

In this example, the pivot table has Region in the Row area, and Total in the Data area. A custom calculation will be added, to show the percentage for each region's sales, compared to the national total.

1. From the Pivot Table field list, drag another copy of the Total field to the Data area.
2. If the data fields are arranged vertically, you can change them to a horizontal layout, by following the instructions in the pivot table tutorial on pivot table data layout.
3. Right-click the heading cell for the new column, and select Field Settings...
4. In the Field Settings dialog box, type a name for the field, e.g. %Sales
5. Click the Options button, to expand the dialog box
6. From the Show data as dropdown list, select % of column
7. Click the OK button



## % of Row

In this example, the pivot table has Item in the Row area, Region in the Column area, and Total in the Data area. The total will be changed to a custom calculation, to show the percentage for each region's sales of an item, compared to the item total.

1. Right-click one of the cells in the Data area, and select Field Settings...
2. In the Field Settings dialog box, type a name for the field, e.g. %Sales
3. Click the Options button, to expand the dialog box
4. From the Show data as dropdown list, select % of row
5. Click the OK button

Sum of Total	Region		
Item	Alberta	Ontario	Quebec
Binder	13%	60%	26%
Desk	49%	51%	0%
Pen	7%	26%	66%
Pen Set	0%	58%	42%
Pencil	11%	72%	17%

## % of Total

In this example, the pivot table has Item in the Row area, Region in the Column area, and Total in the Data area. The total will be changed to a custom calculation, to show the percentage for each region's sales of an item, compared to the Sales Grand Total for all Items.

1. Right-click one of the cells in the Data area, and select Field Settings...
2. In the Field Settings dialog box, type a name for the field, e.g. %Sales
3. Click the Options button, to expand the dialog box
4. From the Show data as dropdown list, select % of Total Click the OK button

Sum of Total	Region			
Item	Alberta	Ontario	Quebec	Grand Total
Binder	7%	29%	13%	49%
Desk	4%	4%	0%	9%
Pen	1%	3%	7%	10%
Pen Set	0%	12%	9%	21%
Pencil	1%	8%	2%	11%
Grand Total	13%	57%	31%	100%

## Difference from

In this example, the pivot table has Region in the Row area, and Total in the Data area. Date is in the Column area, grouped by Year. There is a pivot table tutorial here for grouping pivot table data.

The total will be changed to a custom calculation, to compare the current year's sales for each region, to previous year's sales, in dollars.

1. Right-click one of the cells in the Data area, and select Field Settings...
2. In the Field Settings dialog box, type a name for the field, e.g. Change
3. Click the Options button, to expand the dialog box
4. From the Show data as dropdown list, select Difference From
5. From the Base field list, choose Years
6. From the Base item list, choose (previous)
7. Click the OK button



Show data as: Difference From

Base field: Rep  
Item  
Units  
Unit Cost  
Total  
**Years**

Base item: (previous)  
(next)  
<1/6/2005  
2005  
2006  
>12/22/2006

Change	Date	
Region	2005	2006
Alberta		2024.48
Ontario		3472.05
Quebec		-4385.33

## % Difference from

In this example, the pivot table has Item in the Row area, and Total in the Data area. Date is in the Column area, grouped by Year. There is a pivot table tutorial here for grouping pivot table data.

The total will be changed to a custom calculation, to compare the current year's sales for each Item, to previous year's sales, as a percentage.

1. Right-click one of the cells in the Data area, and select Field Settings...
2. In the Field Settings dialog box, type a name for the field, e.g. %Change
3. Click the Options button, to expand the dialog box
4. From the Show data as dropdown list, select % Difference From
5. From the Base field list, choose Years
6. From the Base item list, choose (previous)
7. Click the OK button

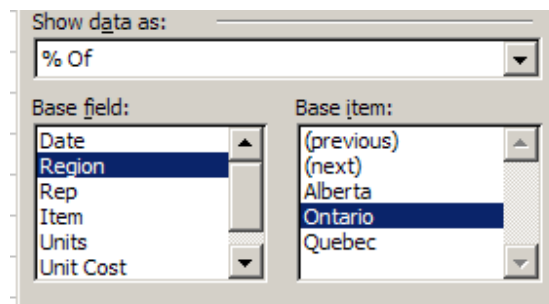
%Change	Date	
Item	2005	2006
Binder		54.26%
Desk		480.00%
Pen		-55.46%
Pen Set		17.39%
Pencil		-88.12%

## % Of

In this example, the pivot table has Item in the Row area, Region in the Column area, and Total in the Data area.

The total will be changed to a custom calculation, to compare each Region's sales to Ontario's sales, as a percentage.

1. Right-click one of the cells in the Data area, and select Field Settings...
2. In the Field Settings dialog box, type a name for the field, e.g. %Ontario
3. Click the Options button, to expand the dialog box
4. From the Show data as dropdown list, select % Of
5. From the Base field list, choose Region
6. From the Base item list, choose Ontario
7. Click the OK button



%Ont	Region		
Item	Alberta	Ontario	Quebec
Binder	22.20%	100.00%	44.00%
Desk	94.29%	100.00%	0.00%
Pen	28.02%	100.00%	250.91%
Pen Set	0.00%	100.00%	72.21%
Pencil	15.00%	100.00%	23.61%

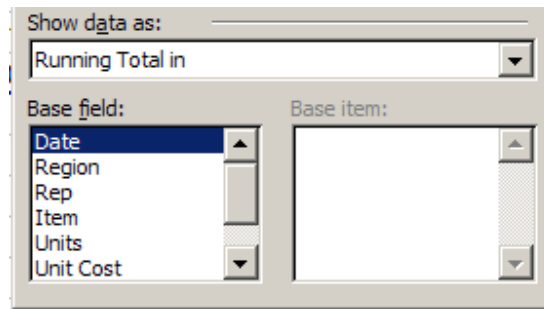
## Running Total in

In this example, the pivot table has Region in the Column area, and Total in the Data area. Date is in the Row area, grouped by Year and Quarter. There is a pivot table tutorial here for pivot table grouping.

The total will be changed to a custom calculation, to calculate a running total of sales for each Region, over each Year.

1. Right-click one of the cells in the Data area, and select Field Settings...

2. In the Field Settings dialog box, type a name for the field, e.g. Sales
3. Click the Options button, to expand the dialog box
4. From the Show data as dropdown list, select Running Total in
5. From the Base field list, choose Date
6. Click the OK button



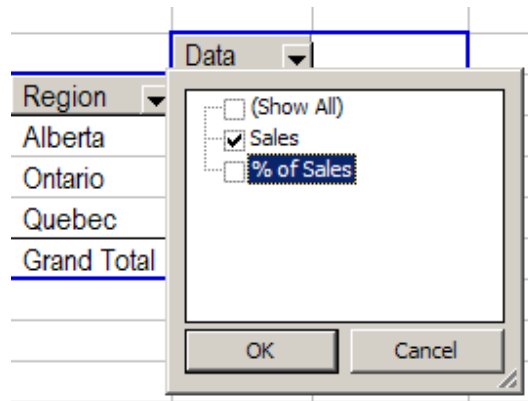
Sales		Region			
Year	Date	Alberta	Ontario	Quebec	Grand Total
2005	Qtr1	167	1,719	189	2,075
	Qtr2	231	2,766	1,028	4,025
	Qtr3	231	3,016	3,135	6,383
	Qtr4	231	3,834	5,194	9,258
2006	Qtr1	140	1,968	20	2,128
	Qtr2	140	3,512	499	4,151
	Qtr3	1,116	5,214	808	7,138
	Qtr4	2,256	7,306	808	10,370

## Remove a Custom Calculation

To remove a custom calculation from a pivot table:

1. Click the dropdown arrow on the Data field button
2. Remove the check mark from the custom calculation.

Note: If you remove an item from the data area, it's removed from the pivot table. To replace it, you can drag it back from the pivot table field list.



## 5. Data Field Layout:

### Arrange Multiple Data Fields

If you place two fields in the Data area of a Pivot Table, they might appear vertically arranged. In this pivot table, the Units and Total fields have been added to the data area in the Pivot Table Wizard.

COLUMN	
Item	
	Sum of Units
	Sum of Total
ROW	DATA

In the pivot table, the two data fields, Sum of Units and Sum of Total, appear in a single column, stacked vertically in the pivot table.

This layout makes it difficult to compare the Units sold for each product or to compare the total sales per product.

2			
3	Item	Data	Total
4	Binders	Sum of Units	392
5		Sum of Total	5729.29
6	Clipboards	Sum of Units	247
7		Sum of Total	1232.53
8	Pencils	Sum of Units	185
9		Sum of Total	368.15
10	Pens	Sum of Units	384
11		Sum of Total	1287.16
12	Total Sum of Units		1208
13	Total Sum of Total		8617.13
14			

To make the data easier to read, you can rearrange the table layout. If you move the data fields into the pivot table's column area, each data field will appear in a single column.

To change the layout, follow these steps:

1. In the pivot table, point to the grey button for the Data field
2. Hold the left mouse button, and drag the Data button onto the cell which contains the word 'Total'
3. Release the mouse button

Item	Data	Total
Binders	Sum of Units	392
	Sum of Total	5729.29
Clipboards	Sum of Units	247

The Data fields will now be arranged horizontally, with each data field in a single column.

	Data	
Item	Sum of Units	Sum of Total
Binders	392	5729.29
Clipboards	247	1262.53
Pencils	185	368.15
Pens	384	1287.16
Grand Total	1208	8617.13

## Rename Data Fields

When you add fields to the Data area, they are renamed, e.g. 'Units' becomes 'Sum of Units'. Instead of using these default names, you can change the field names to something shorter, or more descriptive.

There are several ways to change the names, but the following is probably the easiest.

1. Select the heading cell in the Pivot Table.
2. Type a new heading.
3. Press the Enter key.

**Note:** The typed name can't be the same as the original field name. For example, if the original field name is Units, you can't change 'Sum of Units' to 'Units'. However, you can type the original field name, and add a space character at the end, e.g. 'Units ' or at the beginning -- ' Units'

## 6. Field Settings:

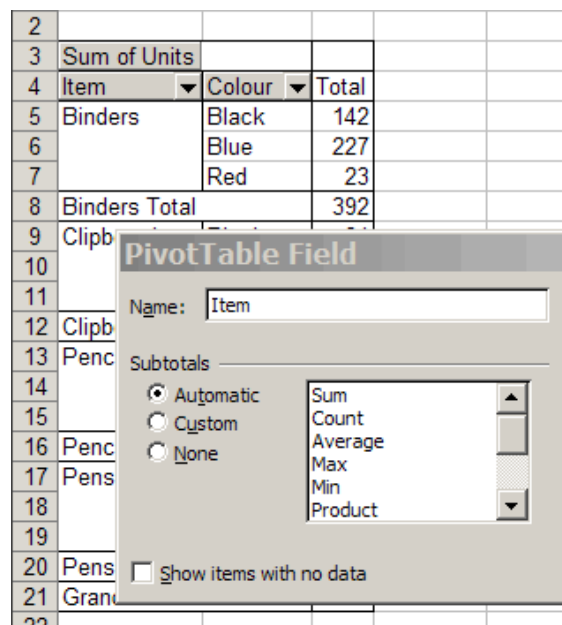
### Manually Hide or Show Subtotals

To manually hide subtotals for a field:

1. Double-click the field button, to open the PivotTable field dialog box.
2. For Subtotals, select 'None'
3. Click OK

To manually show subtotals for a field:

1. Double-click the field button, to open the PivotTable field dialog box.
2. For Subtotals, select 'Custom'
3. Select one of the functions from the list, e.g. 'Average'
4. Click OK.



### Show Items with No Data

By default, the Pivot Table shows only the items for which there is data. In the example shown at right, not all colours were sold each day. You may wish to see all the items each day, even those with no data.

1. Double-click the field button, to open the PivotTable field dialog box
2. Check the 'Show items with no data' check box
3. Click OK.

Colour	Total
Black	63
Blue	9
Red	
Black	
Blue	
Red	82
Black	
Blue	
Red	29
Black	40
Blue	49
Red	32

**PivotTable Field**

Name: Colour

Subtotals

☒ Automatic  
☐ Custom  
☐ None

☒ Show items with no data

Sum  
Count  
Average  
Max  
Min  
Product

## Show Top Items Only

Instead of showing all the items in a field, you can restrict the Pivot Table to show only the top (or bottom) items.

1. Double-click the field button, to open the PivotTable field dialog box
2. Click the Advanced button
3. Under 'Top 10 AutoShow', select On
4. For 'Show', select Top or Bottom
5. Click the Scroll buttons, or type, to enter the number of items to show
6. Click OK.

Top 10 AutoShow

☐ Off  
☒ On

Show: Top 2

Using field:  
Sum of Units

OK Cancel

## 7. Grand Totals:

There's no setting that allows you to display the grand total at the top of an Excel pivot table. However, with the technique in this pivot table tutorial you can use another field that acts as the grand total, and display it at the top.

Note: The instructions and sample file are for Excel 2003 and earlier.  
Download the zipped sample file for this pivot table tutorial

### Create the fake "Grand Total" field

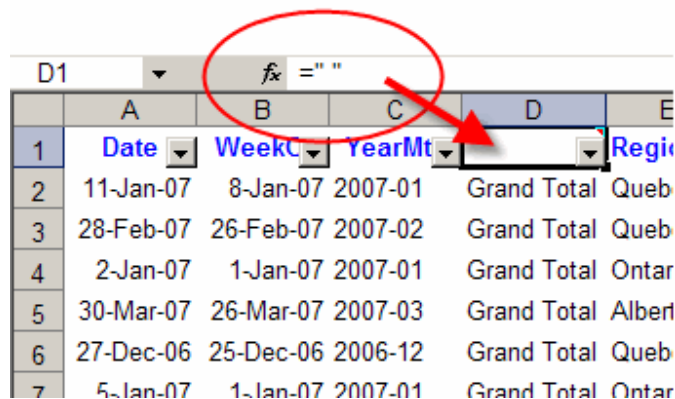
1. In the source data, add a column with the heading GT, or use a space character as the column heading
2. In every row of the source data, for the GT field, enter: Grand Total  
or leave the column blank, except for the heading
3. Add this field to the pivot table, as the first field in the Row area

### Change the Field Settings

1. In the pivot table, right-click on the GT field button, and click Field Settings
2. Click the Layout button
3. Click Show Items in Outline Form
4. Add a check mark to Display Subtotals at Top of Group
5. Click OK, twice

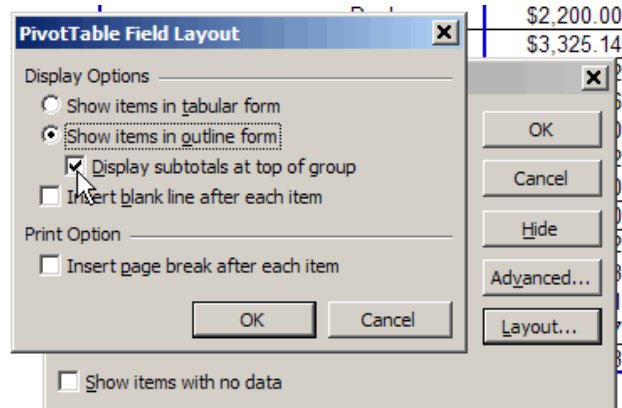
### Hide the original Grand Total

1. Right-click on a cell in the Pivot Table
2. Click Table Options
3. Remove the check mark for Grand Totals for Columns
4. Click OK



	A	B	C	D	E
1	Date	WeekC	YearMt		Regio
2	11-Jan-07	8-Jan-07	2007-01	Grand Total	Queb
3	28-Feb-07	26-Feb-07	2007-02	Grand Total	Queb
4	2-Jan-07	1-Jan-07	2007-01	Grand Total	Ontar
5	30-Mar-07	26-Mar-07	2007-03	Grand Total	Albert
6	27-Dec-06	25-Dec-06	2006-12	Grand Total	Queb
7	5-Jan-07	1-Jan-07	2007-01	Grand Total	Ontar





Employee	(All)	
Sum of Total		
	Item	Total
Grand Total		\$31,809.77
	Pen	\$3,317.91
	Binder	\$6,479.66
	Desk	\$12,575.00
	Paper	\$77.61
	File Folder	\$227.62
	Pen Set	\$9,131.97

## Show Multiple Grand Totals

There's no setting that allows you to display multiple grand totals in a pivot table. However, with the technique in this pivot table tutorial you can use another field that acts as the grand total, and display multiple Grand Totals, such as the Sum and Average overall.

Note: The instructions and sample file are for Excel 2003 and earlier.  
Download the zipped sample file for this pivot table tutorial

Sum of Total		
	Employee	Total
	May	\$4,737.04
	Anderson	\$133.60
	Gill	\$2,074.91
	Howard	\$3,411.02
	Jones	\$3,546.57
	Kivell	\$12,178.45
	Parent	\$1,275.31
	Smith	\$4,452.87
Grand Total Sum		\$31,809.77
Grand Total Average		\$649.18

## Create the fake "Grand Total" field

1. In the source data, add a column with the heading GT, or use a space character as the column heading
2. In every row of the source data, for the GT field, enter: Grand Total  
or leave the column blank, except for the heading.

Add this field to the pivot table, as the first field in the Row area.

	C	D	E	F
	YearM			
1-07	2007-01			
2-07	2007-02			
1-07	2007-01			
1-07	2007-03	Alberta	Smith	De
2-06	2006-12	Quebec	Anderson	Bin
1-07	2007-01	Ontario	Howard	Pei
1-07	2007-01	Quebec	Max	Bin

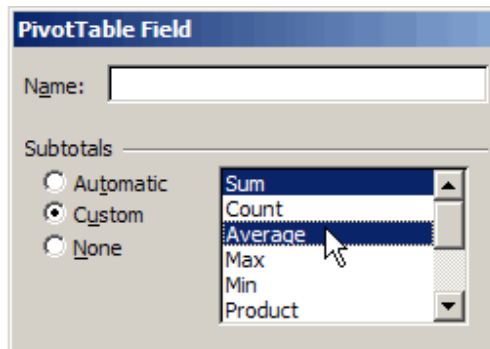
## Change the Field Settings

1. In the pivot table, right-click on the GT field button, and click Field Settings
2. Click the Layout button
3. Click Show Items in Tabular Form

Click OK.

## Select Multiple Functions

1. Under Subtotals, select the summary functions that you want for the multiple subtotals, e.g. Sum and Average.
2. Click OK



## Hide the original Grand Total

1. Right-click on a cell in the Pivot Table
2. Click Table Options
3. Remove the check mark for Grand Totals for Columns
4. Click OK

## 8.) Grouping Data:

In an Excel Pivot Table, you can group the items in a Row or Column field.

For example, items in a date field can be grouped by month, and items in a number field can be grouped by tens

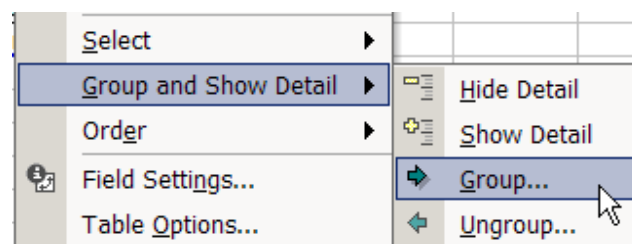
Avg Score	
Date ▼	Total
Jan	77
Feb	60
Apr	72
May	67
Grand Total	67

Avg Score	
Age ▼	Total
10-19	75
20-29	47
30-39	75
40-49	65.75
Grand Total	66.875

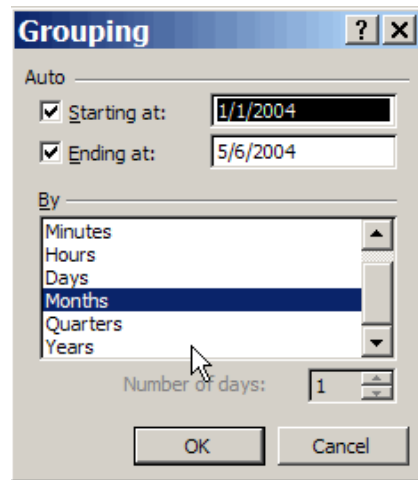
## Grouping Dates

To group the items in a Date field

1. Right-click the Date field button.
2. Choose Group and Show Detail | Group



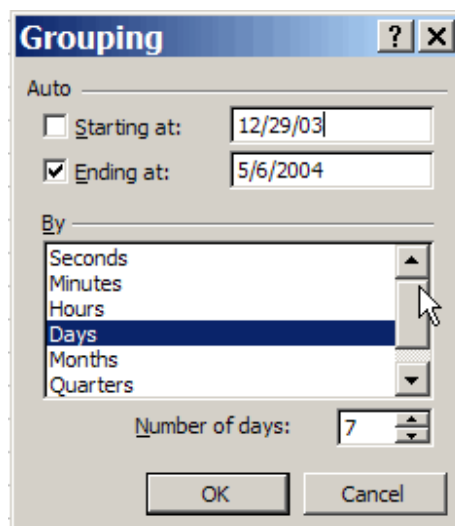
3. In the Grouping dialog box, select one or more options from the 'By' list
4. To limit the dates that are grouped, you can set a Start and End date, by typing the dates in the 'Starting at' and 'Ending at' boxes
5. Click OK to close the dialog box



### **Grouping Dates by Week**

To group the items in a Date field by week

1. Right-click the Date field button
2. Choose Group and Show Detail | Group
3. In the Grouping dialog box, select Days from the 'By' list
4. For 'Number of days', select 7
5. The week range is determined by the date in the 'Starting at' box, so adjust this if necessary. In the example at right, December 29, 2003 (a Monday), was entered as the starting date.
6. Click OK



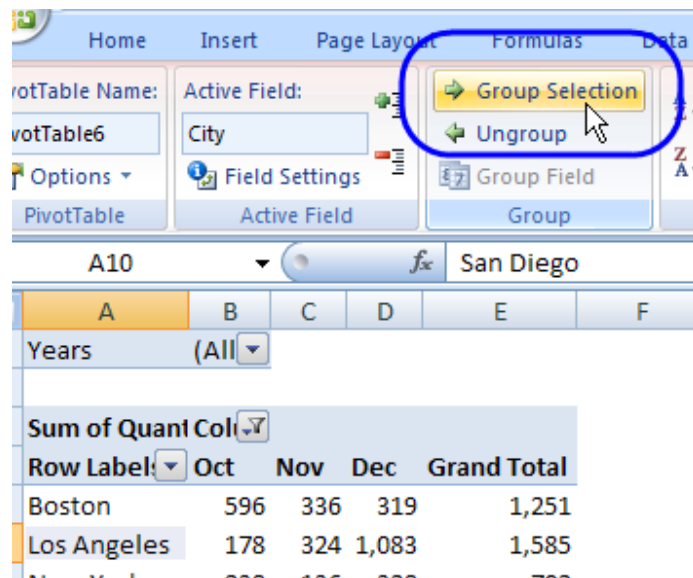
## Grouping Text Items

The Grouping dialog box isn't available if you try to group items in a text field. Instead, you can manually group the items.

1. Select the items that you want to group
2. On the Ribbon's Options tab, click Group, then click Group Selection

To rename the group:

1. Click on the heading cells with the default name, e.g. Group1
2. Type a new name



## Problems when Grouping Data

If you try to group a date or number field, you may see an error message that says, "Cannot group that selection."

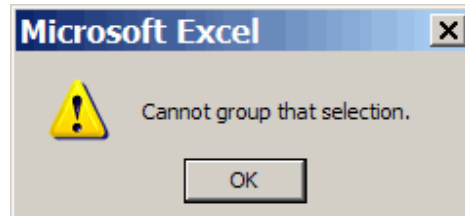
This problem usually occurs when the field contains records with a blank date/number field, or text in a date/number field. To fix the problem

- For blank cells, fill in the date/number (use a dummy date/number if necessary).
- If there is text in the date/number field, remove it.
- If numbers are being recognized as text, use one of the techniques to change text to real numbers. Then return to this pivot table tutorial, and try the grouping steps.

If you don't have blank cells or text in the date column, there may be a grouped field left over from the previous time that you grouped the data.

1. Check the field list, to see if there's a second copy of the date field, e.g. Date2

2. If there is, add it to the row area, and ungroup it
3. Then, you should be able to group the date field again



## Count Unique Items

In an Excel pivot table, you may want to know how many unique customers placed an order for an item, instead of how many orders were placed. A pivot table won't calculate a unique count. However, you could add a column to the database, then add that field to the pivottable.

For example, to count the unique occurrences of a Customer/Item order, add a column to your database, with the heading 'CustItem'

In the first data row, enter a formula that refers to the customer and item columns.  
For example:

Customer	(All)	
	Data	
Item	Sum of CustItem	Count of Item
Binders	9	14
Desk	2	2
Pen	5	5
Pen Sets	5	6
Pencils	5	10
Grand Total	26	37

=IF(SUMPRODUCT((\$A\$2:\$A2=A2)\*(\$C\$2:\$C2=C2))>1,0,1)

Copy the formula down to all rows in the database.

Then, add the field to the data area of the Excel pivot table.

In this example, you can see that nine unique customers placed an order for binders, and there were 14 orders for binders.

## Grouping in One Pivot Table Affects Another

If you create two pivot tables based on the same Excel Table in Excel 2007, when you change the grouping in one pivot table, the same grouping appears in the other pivot table.

Because you created the two pivot tables from the same source data, by default they use the same pivot cache, the grouped items are the same in both tables.

To use different grouping in each pivot table, you'll need to create a separate pivot cache for each pivot table.

Use the following method, suggested in the Excel newsgroups by Dave Peterson.

To create a separate pivot cache for the second pivot table:

1. Cut the second pivot table, and paste it into a new workbook.
2. Change the grouping of the second pivot table.
3. Cut the second pivot table from the new workbook, and paste it back into the original workbook.

	A	B	C	D	E
1					
2					
3	OrderDate	Qty		Quarters	Qty
4	Jan	36432		Qtr1	44130
5	Feb	3701		Qtr2	11380
6	Mar	3997		Qtr3	9560
7	Apr	3852		Qtr4	10333
8	May	4434		Grand Total	75403
9	Jun	3094			

## 9. Multiple Consolidation Ranges:

### Create a Pivot Table from Data on Different Sheets

To create a Pivot Table, you can use data from different sheets in a workbook, or from different workbooks, if those tables have identical column structures.

	A	B	C	D	E	F	G
1	Item	Date	Rep	Colour	Units	Price	Total
2	Binders	1/2/2004	Jones	Black	3	\$ 19.99	\$ 59.97
3	Pens	1/2/2004	Jones	Black	40	\$ 1.29	\$ 51.60
4	Binders	1/2/2004	Ho	Blue	9	\$ 8.99	\$ 80.91
5	Binders	1/2/2004	Ho	Black	39	\$ 19.99	\$ 779.61

However, you won't get the same pivot table layout that you'd get from a single range.

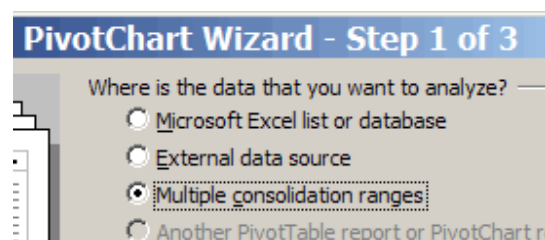
	A	B	C	D	E	F	G
1	Page1	(All)					
2							
3	Sum of Value	Column					
4	Row	Colour	Date	Price	Rep	Total	Units
5	Binders	0	494133	199.88	0	5729.29	392
6	Clipboards	0	304098	39.92	0	1232.53	247
7	Pencils	0	228079	11.94	0	368.15	185
8	Pens	0	570173	48.95	0	1287.16	384

If possible, move your data to a single worksheet, or store it in a database, such as Microsoft Access, and you'll have more flexibility in creating the pivot table.

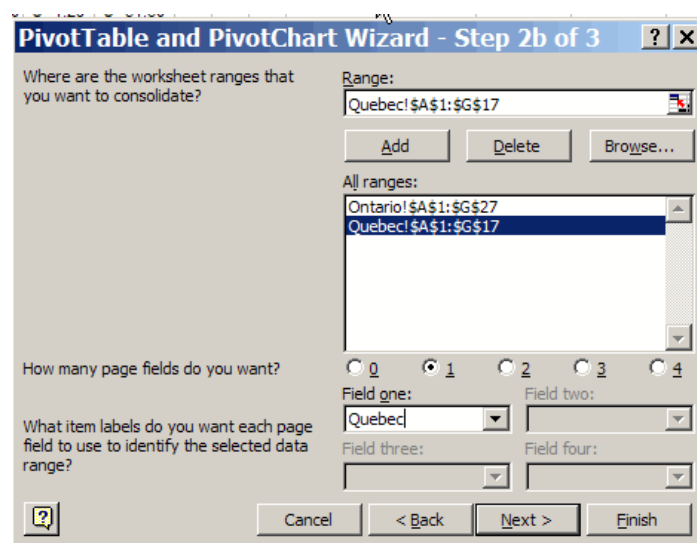
If combining your data isn't an option, this pivot table tutorial explains the steps to create a pivot table from multiple consolidation ranges, describes the limitations, and suggests workaround solutions.

### Create a pivot table from multiple consolidation ranges

1. Choose Data | PivotTable and PivotChart Report (In Excel 2007, press Alt+D, then press P)
2. Select Multiple consolidation ranges, click Next

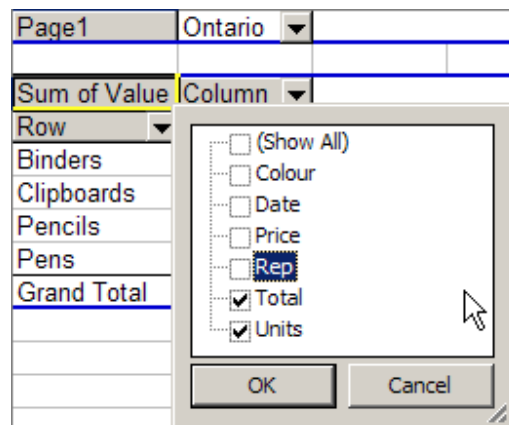


3. Select one of the page options, click Next
4. Select each range, and click Add
5. If you chose 'I will create the page fields', you can select each range, and assign field names, in step 2b
6. Click Next





7. Select a location for the PivotTable, then click Finish
8. In the Column dropdown, hide any columns that contain meaningless data. For example, the Colour column might contain all zeros, because the colours are text, not numbers.



## 10. Report Filters:

### Using Excel Pivot Table Report Filters

After you summarized your data by creating an Excel Pivot Table, you can focus on specific portions of the data by using Excel Pivot Table Report Filters.

For example, instead of showing the sales amounts for all regions, you can select one or two regions, and show their results. Or, show the product sales for a specific city, or one salesperson, instead of the entire company's results.

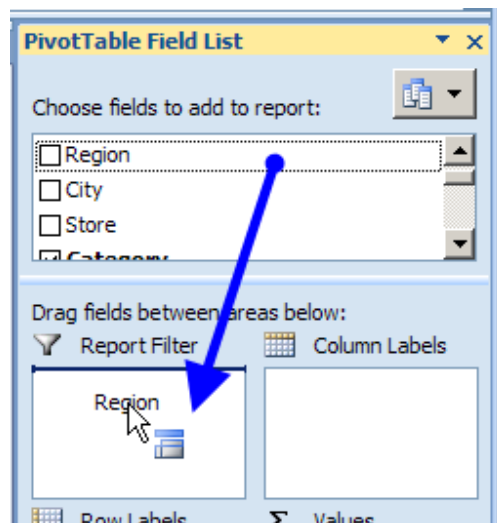
In the pivot table shown at the right, there are Report Filters for Region and City, and Seattle has been selected in the City Report Filter.

	A	B	C
1		Region	(All) ▼
2		City	Seattle ▼
3			
4		Row Labels ▼	Sales
5		Bars	24,662
6		Cookies	39,354
7		Crackers	10,991
8		Snacks	4,013
9		Grand Total	79,021
10			

## Add an Excel Pivot Table Report Filter

To use a pivot table field as a Report Filter, follow these steps.

1. In the PivotTable Field list, click on the field that you want to use as a Report Filter.
2. Drag the field into the Report Filter box, as shown in the screen shot at the right.



On the worksheet, Excel adds the selected field to the top of the pivot table, with the item (All) showing. The values in the pivot table do not change.

In the screen shot at the right, the Region Report Filter is now in place at the top of the pivot table.

**NOTE:** You can add additional Report Filters by dragging more fields to the Report Filter box in the PivotTable Field List.

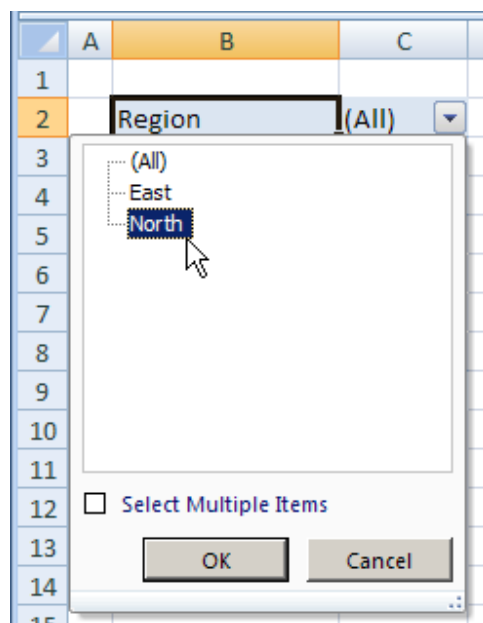
	A	B	C
1			
2		Region	(All) ▼
3			
4		Row Labels ▼	Sales
5		Bars	216,361
6		Cookies	295,314
7		Crackers	108,788
8		Snacks	43,269
9		Grand Total	663,732
10			

## Apply a Filter

After you add a Report Filter, you can select an item from the filter, to change the data that is summarized in the Pivot Table.

1. Click the Report Filter's drop-down arrow, to see a list of items in the field.
2. Click on an item to select it, and click OK.

In the screen shot at the right, the North item in the Region field has been selected.



## Filter for Multiple Items

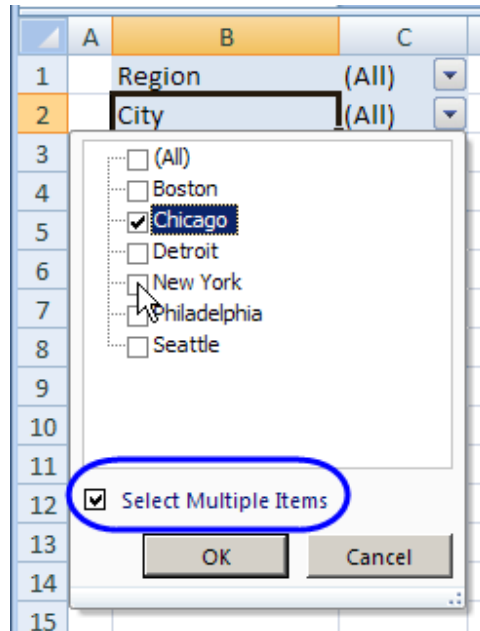
In a Report Filter, you can select multiple items, instead of selecting only one item. For example, when filtering for cities, you might want to see the results for two or more cities, instead of a single city.

In the pivot table shown at the right, City has been added to the Report Filter area.

1. In the pivot table, click the drop-down arrow for a report filter.
2. At the bottom of the items list, add a check mark to Select Multiple Items
3. Check boxes will appear beside the field items, and any currently selected item is checked.
4. To quickly remove the check marks from all the items, click the (All) check box at the top of the list, to clear its check mark. This clears all the check marks in the list.
5. Add check marks to one or more items, then click OK.

Note: Unless at least one item is selected, the OK button will not be available.

The Report Filter now shows (Multiple Items), indicating that two or more items have been selected. The pivot table shows the summarized values for the selected items.

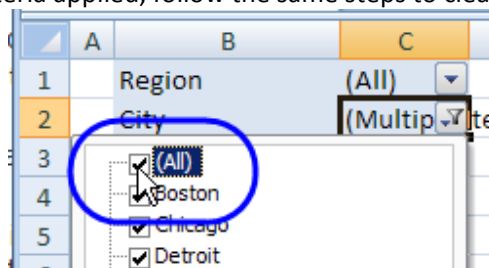


### ***Clear an Excel Pivot Table Report Filter***

When you've finished analyzing the filtered data in a pivot table, you can clear the Report Filters, to see all the data again.

1. In the pivot table, click on the drop down arrow for a Report Filter.
2. Click (All), to remove the filter criteria, and show all the data.

If other Report Filters have criteria applied, follow the same steps to clear their criteria.

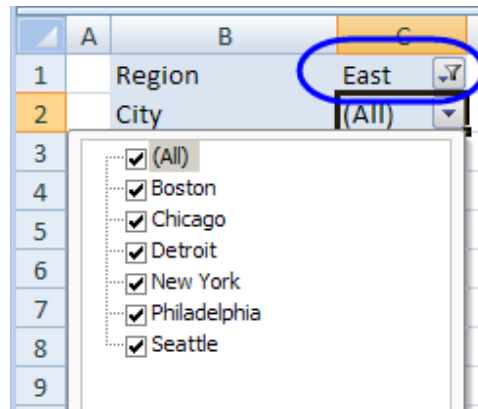


### ***Report Filters are Not Dependent***

The Excel Pivot Table Report Filters are not dependent, so items that you select in one Report Filter will not affect the items available in any other Report Filters.

For example, in the pivot table shown at the right, East has been selected from the Region drop down.

However, all the cities show up in the item list for the City Report Filter. Only Boston, New York and Philadelphia are in the East region. If you select a city that's not in the East region, like Seattle, the pivot table won't show any records.



## 11. Running Totals:

### Set up the Pivot Table

At the right is a pivot table which contains monthly sales figures for several products. In the pivot table, Date is in the row area, grouped by month. Product is in the column area, and Units sold, shown as Sum of Units, is in the data area.

We can see the Grand Total for each month, and for each product code.

Currently, there are only Normal calculations in the pivot table, no custom calculations.

No Custom Calculation			
Sum of Units	Product		
Date	A703	B306	Grand Total
Jan	295	398	693
Feb	326	19	345
Mar	120	197	317
Grand Total	741	614	1355

### Add a Custom Calculation

To calculate a running total of units sold, for each Product, over the three months, we'll change the Units to a custom calculation.

1. Right-click one of the cells in the Data area, and select Field Settings
2. In the Field Settings dialog box, type a name for the field, e.g. Sales

3. Click the Options button, to expand the dialog box
4. From the Show data as dropdown list, select Running Total in
5. From the Base field list, choose Date
6. Click the OK button

Note: If you select a base field that isn't in the row or column area, all the results will show an #N/A error. Also, if there's an error in any month's results, it will carry down through the remaining months.

You can now see that there were 621 units of the A703 product sold by the end of February. The Grand Total column shows that 1355 units, of all products, were sold by the end of March.

**Running Total in Date**

Sum of Units			
Date	A703	B306	Grand Total
Jan	295	398	693
Feb	621	417	1038
Mar	741	614	1355
Grand Total			

### **Change the Base Field**

Because you chose Date as the base field, each Product column shows a running total for the year, by month.

If you select Product as the base field, the running total accumulates across the pivot table, in each month row, as shown in the pivot table at the right.

In the February row, you can see that 326 units of the first product were sold. In the next column, you can see that 345 units were sold, which includes the B306 units.

**Running Total in Product**

Sum of Units			
Date	A703	B306	Grand Total
Jan	295	693	
Feb	326	345	
Mar	120	317	
Grand Total	741	1355	

### **Running Totals with Multiple Row Fields**

For pivot tables with multiple fields in the row area, the running totals work the same way, but may be harder to follow as the layout becomes more complex.

For example, in the original pivot table in this pivot table tutorial, we could move the Product field to the row area, as you can see in the pivot table at the right. All the original amounts are still shown, but they're all in the same column.

At right is the pivot table as it looks before we add the running totals.

No Custom Calculation		
Sum of Units		
Date ▼	Prod ▼	Total
Jan	A703	295
	B306	398
Jan Total		693
Feb	A703	326
	B306	19
Feb Total		345
Mar	A703	120
	B306	197
Mar Total		317
Grand Total		1355

When we add the Running Total custom calculation, with Product moved to the row area, the running total amounts are the same but are arranged vertically, as shown at the right.

In the February section you can see that 621 units of the A703 product sold by the end of that month.

The February total shows the running total for all products, at the end of that month.

Running Total in Date		
Sum of Units		
Date ▼	Prod ▼	Total
Jan	A703	295
	B306	398
Jan Total		693
Feb	A703	621
	B306	417
Feb Total		1038
Mar	A703	741
	B306	614
Mar Total		1355
Grand Total		

When we add the Running Total custom calculation, with Product moved to the row area, the running total amounts are the same but are arranged vertically, as shown at the right.

In the February section, you can see that 326 units of the first product were sold. In the next row, you can see that 345 units were sold, which includes the B306 units.

Because the Running Total is by Product, the month totals are blank. The last product in each month shows that month's total units sold.

**Running Total in Product**

Sum of Units		
Date ▼	Prod ▼	Total
Jan	A703	295
	B306	693
Jan Total		
Feb	A703	326
	B306	345
Feb Total		
Mar	A703	120
	B306	317
Mar Total		
Grand Total		

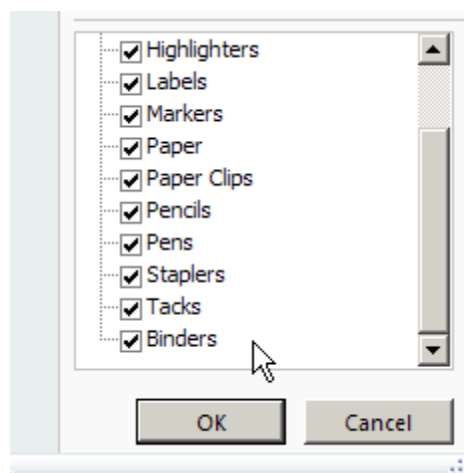
## 12. Sorting:

### *New Pivot Table Items Out of Order*

When you add new records to your pivot table source data, and refresh the pivot table, new items might appear in the drop down lists.

Sometimes, those new items appear at the end of the list, instead of in alphabetical order. For example, in the screen shot below, binders were just added to this pivot table's source data.

When the pivot table was refreshed, Binders appeared at the bottom of the Product list, instead of the top.



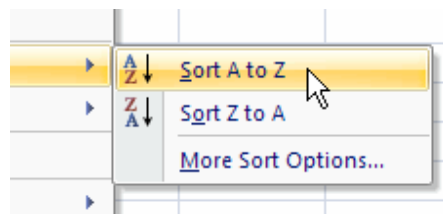


## Fix the Sort Order

Items in the pivot table drop down lists can get out of order, if you have manually rearranged the items in the Row Labels area. If a field is set for Manual sort, new items will appear at the end of the drop-down list.

Follow these steps to sort the field in ascending order:

1. Right-click a cell in the Product field. For example, right-click the Envelopes cell.
2. Click Sort, and then click Sort A to Z.



When you sort the Product field, its sort setting changes from Manual to Sort Ascending or Sort Descending.

This also sorts the drop-down list, and makes it easier for users to find the items they need.

## Sort a Pivot Table Field Left to Right

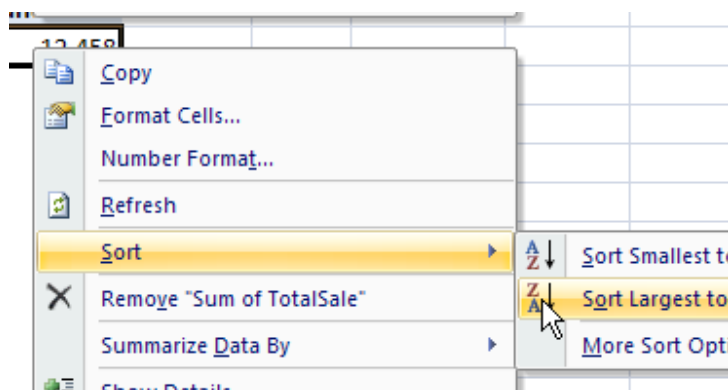
Usually you sort a pivot table by the values in a column, such as the Grand Total column.

By sorting, you can highlight the highest or lowest values, by moving them to the top of the pivot table.

To sort a pivot table column:

1. Right-click on a value cell, and click Sort.

Then, click Sort Smallest to Largest or Sort Largest to Smallest



## Sort a Pivot Table Row

You can also sort a pivot table row by its values, left to right. This moves the largest or smallest amounts to the left of the pivot table, so you can focus on them.

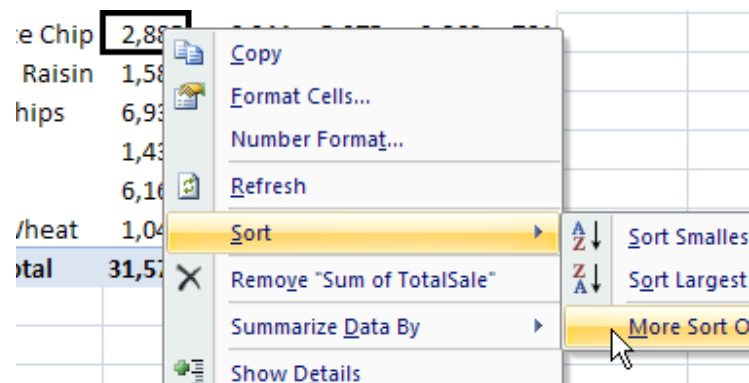
For example, in the pivot table shown below, the cities columns are in alphabetical order, with Boston at the left.

4	Row Labels	Boston	Chicago	Miami	Seattle
5	Arrowroot	2,223	3,626	3,925	2,684
6	Banana	2,183	780	445	145
7	Bran	6,318	6,323	12,424	6,636
8	Carrot	734	643	700	717
9	Cheese	62	295	381	207
10	Chocolate Chip	2,885	6,044	5,975	3,860
11	Oatmeal Raisin	1,584	1,447	1,857	2,945

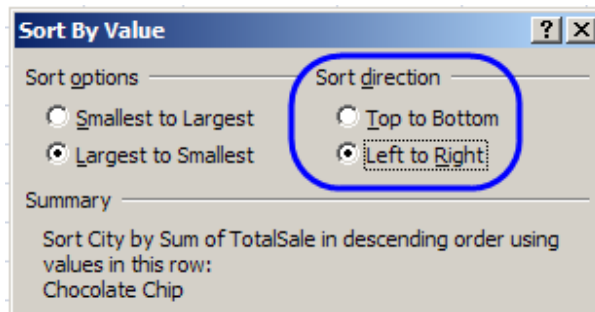
To highlight the city with the highest sales, you can sort the Chocolate Chip row, so the sales per city are sorted in descending order.

To sort the pivot table row:

1. In the pivot table, right-click a value cell in the Chocolate Chip row.
2. Click Sort, and then click More Sort Options



3. In the Sort By Value dialog box, under Sort Options, select Largest to Smallest.
4. Under Sort direction, select Left to Right. In the Summary section, you can see a description of the sort settings.



5. Click OK to close the dialog box.

After you sort the Chocolate Chip row, left to right, the values in the Chocolate Chip row are sorted largest to smallest, from left to right.

The City column order has changed, and Chicago, which has the highest Chocolate Chip sales, is at the left.

4	Row Labels	Chicago	Miami	Seattle	Boston
5	Arrowroot	3,626	3,925	2,684	2,223
6	Banana	780	445	145	2,183
7	Bran	6,323	12,424	6,636	6,318
8	Carrot	643	700	717	734
9	Cheese	295	381	207	62
10	Chocolate Chip	6,044	5,975	3,860	2,885
11	Oatmeal Raisin	1,447	1,857	2,945	1,584

**NOTE:** Rows for other products may not be in descending

### 13. Subtotals:

#### Creating Excel Pivot Table Subtotals

If your pivot table has only one field in the Row Labels area, you won't see any Row subtotals.

In the pivot table shown below, Service is in the Row Labels area, Lead Tech is in the Column Labels area, and Labor Cost is in the Values area. Because Service is the only field in the Row Labels area, it has no subtotal.

	A	B	C	D	E	F
1						
2						
3		LaborCost	Techs			
4		Row Labels	Burton	Khan	Ling	Total
5		Install	12,720	7,445	12,310	32,475
6		Repair	10,920	10,515	11,270	32,705
7		Total	23,640	17,960	23,580	65,180
8						

When you add another field to the Row Labels area, a subtotal is automatically created for the first field. In this example, the District field is added to the Row Labels area, below the Service field.

- The Service field is an Outer Field, because there is a field below it (District).
- The District field is an Inner Field, because there is NO field below it.

Because Service is now an Outer Field, it automatically has a subtotal after each Service type. Each subtotal shows the name of the Service type, and "Total", such as Install Total.

	A	B	C	D	E	F
1						
2						
3		LaborCost	Techs			
4		Row Labels	Burton	Khan	Ling	Total
5		Install				
6		Central	6,615	2,705	1,015	10,335
7		East		210	1,990	2,200
8		Install Total	6,615	2,915	3,005	12,535
9		Repair				
10		Central	4,275	3,335	315	7,925
11		East			2,455	2,455
12		Repair Total	4,275	3,335	2,770	10,380
13		Total	10,890	6,250	5,775	22,915

### Add Another Subtotal

If you add another field to the Row Labels area, below the District field, the new field becomes the Inner Field, and District changes to an Outer Field.

In the pivot table below, the Technician Count field was added below District, and the District field now has a subtotal after each District name.

	A	B	C	D	E	F
1						
2						
3		LaborCost	Techs			
4		Row Labels	Burton	Khan	Ling	Total
5		Install				
6		Central				
7		1	1,540	640		2,180
8		2	5,075	2,065	1,015	8,155
9		Central Total	6,615	2,705	1,015	10,335
10		East				
11		1			940	940
12		2		210	1,050	1,260
13		East Total		210	1,990	2,200
14		Install Total	6,615	2,915	3,005	12,535
15		Repair				

### Automatic Subtotal Summary Function

When a subtotal is added to a pivot table, its Summary Function is set to Automatic. With that setting, the subtotal automatically uses the same Summary Function as the Value fields in each column.

In the pivot table shown above, the Value fields are using the SUM function, so the subtotals also show the SUM of the values.

In the pivot table shown below, the Value fields have been changed to the MAX function, so the subtotals also show the MAX of the values. A few of the MAX values are highlighted in green, to show that the values and both subtotals are the same.

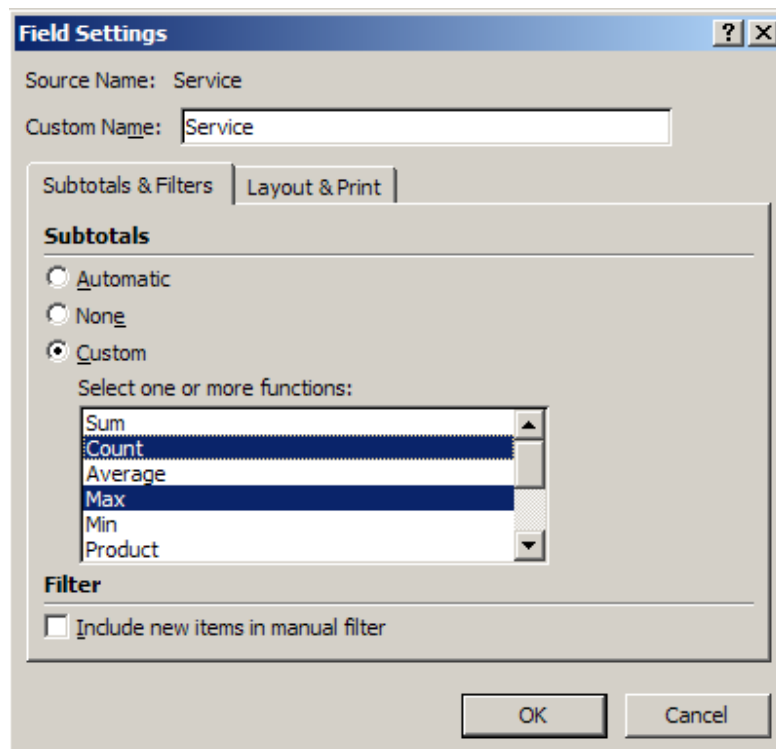
Even though the Summary Function has been changed to MAX, each subtotal still shows the name of the item, and "Total", such as Central Total.

	A	B	C	D	E	F
1						
2						
3		LaborCost	Techs			
4		Row Labels	Burton	Khan	Ling	Total
5		Install				
6		Central				
7		1	480	240		480
8		2	1,960	735	1,015	1,960
9		Central Total	1,960	735	1,015	1,960
10		East				
11		1			700	700
12		2		210	350	350
13		East Total		210	700	700
14		Install Total	1,960	735	1,015	1,960
15		Repair				

## Change the Subtotal Summary Function

Instead of using the Automatic setting for subtotals, you can select a Custom setting. To change the setting:

1. Right-click a label for the field in which you want to change the subtotal. In this example, right-click cell B5, which has the Install label.
2. In the pop-up menu, click Field Settings
3. In the Field Settings dialog box, click the Subtotals & Filters tab
4. Under Subtotals, click Custom
5. In the list of Summary Functions, click one or more function names
6. Click OK to close the dialog box.



## Show Multiple Subtotals

In the Field Settings dialog box shown above, there are two functions, Count and Max, selected in the list of Summary Functions for the Service field.

After selecting these functions, the pivot table shows two subtotals for each Service type. When you use Custom functions, the subtotal row shows the item name, and the name of the Function, such as Install Count.

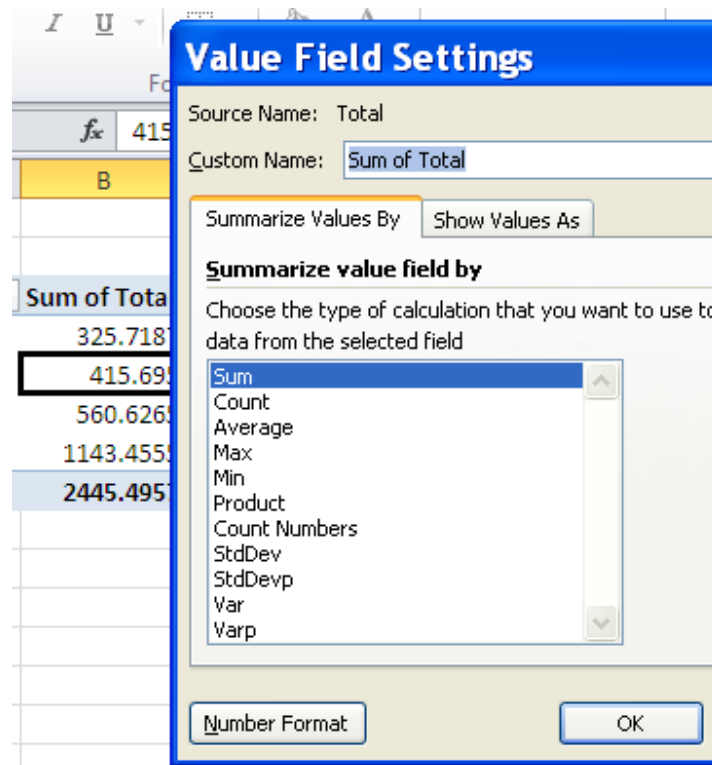
The subtotals for District are not changed, nor are the other values in the pivot table.

	A	B	C	D	E	F
1						
2						
3		LaborCost	Techs			
4		Row Labels	Burton	Khan	Ling	Total
5		Install				
6		Central				
7		1	1,540	640		2,180
8		2	5,075	2,065	1,015	8,155
9		Central Total	6,615	2,705	1,015	10,335
10		East				
11		1			940	940
12		2		210	1,050	1,260
13		East Total		210	1,990	2,200
14		Install Count	16	12	10	38
15		Install Max	1,960	735	1,015	1,960

## 14. Summary Functions:

When you add a field to the pivot table's Values area, 11 different functions, such as Sum, Count and Average, are available to summarize the data.

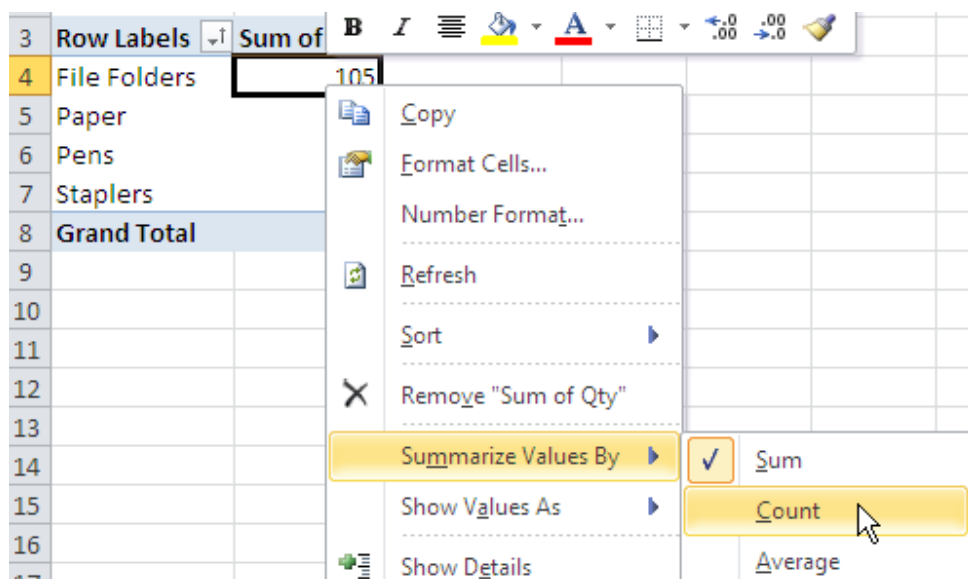
The summary functions in a pivot table are similar to the worksheet functions with the same names, with a few differences as noted in the descriptions that follow.



### Change the Summary Function

When you add a numerical field to the pivot table's Values area, Sum or Count will be the default summary function. To select a different summary function, follow these steps:

1. Right-click on a cell in the Value field that you want to change.
2. In the pop-up menu, click Summarize Values By
3. Click on the Summary Function that you want to use

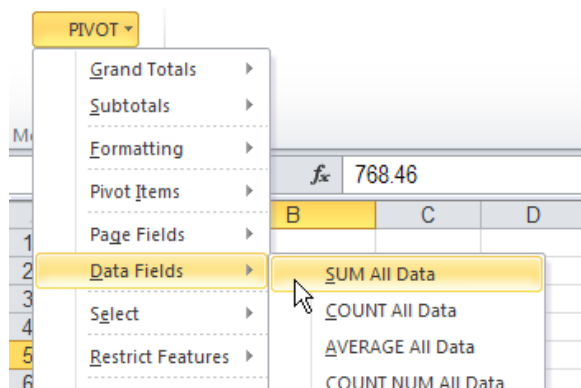




## Pivot Table Add-in

There's a feature that quickly changes ALL the data fields to SUM, or any other summary function, in my free pivot table add-in -- PivotPower.

1. After you install the add-in, select any cell in the pivot table.
2. Then, on the Add-Ins tab, click Pivot.
3. Click Data Fields, then click the Summary function that you want to use.



## Sum Function

The pivot table's Sum function totals all the underlying values for each item in the field. The result is the same as using the SUM function on the worksheet to total the values.

When you add a numerical field to the pivot table's Values area, Sum will be the default summary function. (Note: If the field contains text or blank cells, Count will be the default.)

In the screen shot at the right, you can see the source data for a small pivot table, and the total quantity, using the worksheet's SUM function, is 317.

With a pivot table, you can quickly see the total sum for each product that was sold, and the grand total -- 317 -- which matches the worksheet total.

	A	B
1		
2		
3	Row Labels	Sum of Qty
4	File Folders	105
5	Paper	50
6	Pens	95
7	Staplers	67
8	Grand Total	317
9		

	A	B	C	
1	Date	Product	Qty	
2	9-Jul	File Folders	8	
3	11-Jul	File Folders	97	
4	4-Jul	Paper	20	
5	7-Jul	Paper	10	
6	12-Jul	Paper	20	
7	6-Jul	Pens		
8	8-Jul	Pens	95	
9	5-Jul	Staplers	42	
10	10-Jul	Staplers	25	
11				
12		Total	317	
13				

## Count Function

Count is the default summary function when fields with nonnumeric or blank cells are added to the Values area. The Count function's name is slightly confusing, because it's like the COUNTA worksheet function, not the COUNT worksheet function.

The pivot table Count function counts:

- text
- numbers
- errors

Blank cells are not counted.

## Select a Field to Count

If you're using the Count function in a pivot table, be careful which field you use for the count. For example, in the pivot table source data shown at the right, cell C7, in the Qty column, is blank.

If you want to count the order for Pens, and use the Qty field, the blank cell (C7) would not be counted. The number of orders for Pens would show as 1 (pivot table at left, below).

Instead, you could add the Product field to the Values area, and the Pens orders would show a count of 2 (pivot table at right, below). ▲

	A	B	C	D	E
1					
2					
3	Count of			Count of	
	Row Labels	Qty		Row Labels	Product
4	File Folders	2		File Folders	2
5	Paper	3		Paper	3
6	Pens	1		Pens	2
7	Staplers	2		Staplers	2
8	Grand Total	8		Grand Total	9
9					

	A	B	C	
1	Date	Product	Qty	C
2	9-Jul	File Folders	8	
3	11-Jul	File Folders	97	
4	4-Jul	Paper	20	:
5	7-Jul	Paper	10	:
6	12-Jul	Paper	20	:
7	6-Jul	Pens		
8	8-Jul	Pens	95	
9	5-Jul	Staplers	42	:
10	10-Jul	Staplers	25	:
11				
12	Count	9	8	
13				

## Average Function

The Average function totals all the underlying values in the Values area, and it divides by the number of values. The result is the same as using the AVERAGE function on the worksheet to calculate the average (mean) of the values.

## Blanks and Zeros

Blank cells are ignored when calculating the pivot table averages, but zero cells are included.

In the data source shown at the right, cell C7 is blank, and is not included in either the worksheet average (C12), or the pivot table average, shown below.

If you have formatted the worksheet to hide zero values, remember that those zero values will be included in the averages, even if the cells appear blank.

## Format the Results

When you use the Average summary function, the results will probably show a strange mixture of decimal places, as shown in the pivot table at the left, in the screen shot below.

Format the field to have a consistent number of decimal places (as in the pivot table at the right, below), so the numbers are easy to compare.

	A	B	C	D	E
1					
2					
3	Row Labels	Average of Qty	Row Labels	Average of Qty	
4	File Folders	52.5	File Folders	52.50	
5	Paper	16.66666667	Paper	16.67	
6	Pens	95	Pens	95.00	
7	Staplers	33.5	Staplers	33.50	
8	Grand Total	39.625	Grand Total	39.63	
9					

	A	B	C	
1	Date	Product	Qty	C
2	9-Jul	File Folders	8	
3	11-Jul	File Folders	97	
4	4-Jul	Paper	20	
5	7-Jul	Paper	10	
6	12-Jul	Paper	20	
7	6-Jul	Pens		
8	8-Jul	Pens	95	
9	5-Jul	Staplers	42	
10	10-Jul	Staplers	25	
11				
12		Average	39.63	

## Max Function

The Max summary function shows the maximum value from the underlying values in the Values area. The result is the same as using the MAX function on the worksheet to calculate the maximum of the values.

In the screen shot at the right, you can see the source data for a small pivot table, and the maximum quantity, using the worksheet's MAX function, is 97.

With a pivot table, you can quickly see the maximum for each product that was sold, and the grand total -- 97 -- which matches the worksheet maximum.

	A	B	C
1			
2			
3	Row Labels	Max of Qty	
4	File Folders	97	
5	Paper	20	
6	Pens	95	
7	Staplers	42	
8	Grand Total	97	
9			

	A	B	C
1	Date	Product	Qty
2	9-Jul	File Folders	8
3	11-Jul	File Folders	97
4	4-Jul	Paper	20
5	7-Jul	Paper	10
6	12-Jul	Paper	20
7	6-Jul	Pens	
8	8-Jul	Pens	95
9	5-Jul	Staplers	42
10	10-Jul	Staplers	25
11			
12		Max	97
13			

## Min Function

The Min summary function shows the minimum value from the underlying values in the Values area. The result is the same as using the MIN function on the worksheet to calculate the minimum of the values.

In the screen shot at the right, you can see the source data for a small pivot table, and the minimum quantity, using the worksheet's MIN function, is 8.

With a pivot table, you can quickly see the minimum for each product that was sold, and the grand total -- 8 -- which matches the worksheet minimum.

In both the worksheet and the pivot table, the blank cell is ignored when calculating the minimum amount. ▲

	A	B	C
1			
2			
3	Row Labels	Min of Qty	
4	File Folders	8	
5	Paper	10	
6	Pens	95	
7	Staplers	25	
8	Grand Total	8	
9			

	A	B	C	D
1	Date	Product	Qty	
2	9-Jul	File Folders	8	
3	11-Jul	File Folders	97	
4	4-Jul	Paper	20	
5	7-Jul	Paper	10	
6	12-Jul	Paper	20	
7	6-Jul	Pens		
8	8-Jul	Pens	95	
9	5-Jul	Staplers	42	
10	10-Jul	Staplers	25	
11				
12		Min	8	
13				

## Product Function

The Product summary function shows the result of multiplying all the underlying values in the Values area. The result is the same as using the PRODUCT function on the worksheet to calculate the product of the values.

I've never had to use the Product summary function in a pivot table, and can't imagine a situation where it would be useful. However, you might have a use for it, and here's how it works.

In the screen shot below, you can see the pivot table source data, with the PRODUCT calculated for each product group. At the bottom of the source data is the overall PRODUCT calculation.

	A	B	C	D
1	Date	Product	Qty	Product
2	9-Jul	File Folders	8	776
3	11-Jul	File Folders	97	
4	4-Jul	Paper	20	4000
5	7-Jul	Paper	10	
6	12-Jul	Paper	20	
7	6-Jul	Pens		95
8	8-Jul	Pens	95	
9	5-Jul	Staplers	42	1050
10	10-Jul	Staplers	25	
11				
12		Product	309,624,000,000	

The results of the Product function may be very large numbers and default to a Scientific number format. You can format the numbers as Number format, instead of Scientific format.

Note: Excel only stores and calculates with 15 significant digits of precision, so after the 15th character you'll only see zeros.

	A	B	C	E
1				
2				
3	Row Labels	Product of Qty		Product of Qty
4	File Folders	776		776
5	Paper	4000		4,000
6	Pens	95		95
7	Staplers	1050		1,050
8	Grand Total	3.09624E+11		309,624,000,000
9				
10				

## Count Numbers Function

The Count Numbers summary function counts all the underlying numbers in the Values area. The result is the same as using the COUNT function on the worksheet. Blank cells, errors, and text are not counted.

In the screen shot at the right, you can see the source data for a small pivot table, and the count of the numbers in the Qty column (column C). In cell C4, the value of 20 is entered as text, so that cell isn't counted.

## Count Numbers vs. Count

In the pivot table shown below, the Qty field has been added twice to the Values area. In column B, the summary function is Count Numbers, and the Grand Total is 7.

In column C, the summary function is Count, which includes text, so the Grand Total for that column is 8.▲

	A	B	C
1			
2			
3	Values		
4	Row Labels	Count of Qty	Count of Qty2
5	File Folders	2	2
6	Paper	2	3
7	Pens	1	1
8	Staplers	2	2
9	Grand Total	7	8
11		Count Numbers	Count
12			

	A	B	C	D
1	Date	Product	Qty	
2	9-Jul	File Folders	8	
3	11-Jul	File Folders	97	
4	4-Jul	Paper	20	
5	7-Jul	Paper	10	
6	12-Jul	Paper	20	
7	6-Jul	Pens		
8	8-Jul	Pens	95	
9	5-Jul	Staplers	42	
10	10-Jul	Staplers	25	
11				
12		Count	7	
13				

## StdDev Function and StdDevP Function

Like the STDEV.P and STDEV.S worksheet functions, the StdDevp and StdDev summary functions calculate the standard deviation for the underlying data in the Values area. The standard deviation is a measure of how widely the values vary from the average of the values.



The StdDevP summary function should be used when the entire population is used in the calculation. When a sample of the data is used, not the entire population, then use the StdDev summary function.

In the screen shot below, you can see example pivot table source data, and the STDEV.P worksheet function is calculating the standard deviation for each product type. For the File Folders, there is a large difference between the quantities sold, and the standard deviation is high -- 44.5. For Paper, the difference in quantity is much smaller, and the standard deviation is low -- 4.7.

D2				$\text{fx}$	<code>=STDEV.P(C2:C3)</code>
	A	B	C	D	E
1	Date	Product	Qty	STDEV.P	
2	9-Jul	File Folders	8	44.5	
3	11-Jul	File Folders	97		
4	4-Jul	Paper	20	4.714045	
5	7-Jul	Paper	10		
6	12-Jul	Paper	20		
7	6-Jul	Pens	16	39.5	
8	8-Jul	Pens	95		
9	5-Jul	Staplers	42	8.5	
10	10-Jul	Staplers	25		
11					
12		STDEV.P	32.87		
13					

When the Qty field is added to the pivot table, change the summary calculation to StdDev.

Paste					
Clipboard					
B4				$\text{fx}$	
	A	B			
1					
2					
3	Row Labels	Sum of			
4	File Folders	105.0			
5	Paper	50.0			
6	Pens	111.0			
7	Staplers	67.0			
8	Grand Total	333.0			
9					

### Value Field Settings

Source Name: Qty

Custom Name: StdDev of Qty

Summarize Values By: Show Values As

**Summarize value field by**

Choose the type of calculation that you want to data from the selected field

- Product
- Count Numbers
- StdDev
- StdDevP**
- Var
- Varp

In the screen shot below, you can see that the standard deviations in the pivot table are the same as those that were calculated on the worksheet.

	A	B
1		
2		
3	Row Labels	StdDev of Qty
4	File Folders	44.5000
5	Paper	4.7140
6	Pens	39.5000
7	Staplers	8.5000
8	Grand Total	32.8667
9		

Note: If the count of items is one, a #DIV/0! error is displayed when using the StdDev summary function, because one is subtracted from the count when calculating the standard deviation.

### How the Standard Deviation is calculated

For the standard deviation, each number is compared to the mean of the numbers. You could calculate the standard deviation on the worksheet, without using the STDEV.P function.

1. Find the average of the numbers in the pivot table data.
2. From each number, subtract the average.
3. Square the calculated difference for each number
4. Find the average of the squared difference.
5. Find the square root of the average.

	A	B	C	D	E	F	G	H
1								
2		Data		Diff from Avg		Sq'd		
3		8		=(B3-\$B\$12)		=D3^2		
4		97		60		3600		
5		20		-17		289		
6		10		-27		729		
7		20		-17		289		
8		16		-21		441		
9		95		58		3364		
10		42		5		25		
11		25		-12		144		
12	1	37				1080		5
13		Avg			4	Variance		St Dev
14						=AVERAGE(F3:F11)		
15								

## Var Function and Varp Function

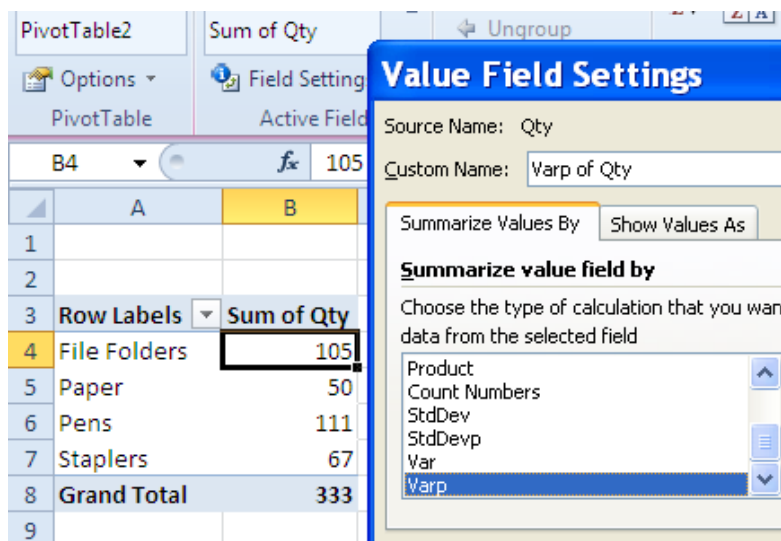
The Var and Varp summary functions work like the VAR.P and VAR.S worksheet functions, to calculate the variance for the underlying data in the Values area, and variance is a measure of how widely the values vary from the average of the values.

When the entire population is used in the calculation, the VarP summary function is used. For a sample of the data, instead of the entire population, use the Var summary function.

In the screen shot below is the example pivot table source data, with the VAR.P worksheet function calculating the variance for each product type. For the File Folders, where there is a wide difference between the two quantities, the variance is large -- 1980.25. For the paper sales, there is a small difference in quantity, and the variance is only 22.22.

D2				<b>fx</b>	<b>=VAR.P(C2:C3)</b>
	A	B	C	D	
1	Date	Product	Qty	VAR.P	
2	9-Jul	File Folders	8	1,980.250	
3	11-Jul	File Folders	97		
4	4-Jul	Paper	20	22.222	
5	7-Jul	Paper	10		
6	12-Jul	Paper	20		
7	6-Jul	Pens	16	1,560.250	
8	8-Jul	Pens	95		
9	5-Jul	Staplers	42	72.250	
10	10-Jul	Staplers	25		
11					
12		VAR.P	1,080.22		

To show the variance, when the Qty field is added to the pivot table, change the summary calculation to Varp.



The screenshot shows a PivotTable with the following data:

Row Labels	Sum of Qty
File Folders	105
Paper	50
Pens	111
Staplers	67
<b>Grand Total</b>	<b>333</b>

The **Value Field Settings** dialog box is open, showing the following configuration:

- Source Name:** Qty
- Custom Name:** Varp of Qty
- Summarize Values By:** Show Values As
- Summarize value field by:** Choose the type of calculation that you want data from the selected field
- Product:** Count Numbers, StdDev, StdDevp, Var, **Varp**

As you can see, the variances shown in the pivot table are the same as those that were calculated on the worksheet.

	A	B
1		
2		
3	Row Labels	Varp of Qty
4	File Folders	1980.250
5	Paper	22.222
6	Pens	1560.250
7	Staplers	72.250
8	Grand Total	1080.222
9		
10		

Note: If the count of items is one, a #DIV/0! error is displayed when using the Var summary function, because one is subtracted from the count when calculating the variance.

### How the Variance is calculated

For the variance, each number is compared to the mean of the numbers. You could calculate the variance on the worksheet, without the VAR.P function.

1. Find the average of the numbers in the pivot table data.
2. From each number, subtract the average.
3. Square the calculated difference for each number
4. Find the average of the squared difference.

	A	B	C	D	E	F	G
1							
2				Diff			
3		Data	2	from			3
4		8		Avg		Sq'd	
5		97		=(B3-\$B\$12)		=D3^2	
6		20		60		3600	
7		10		-17		289	
8		10		-27		729	
9		20		-17		289	
10		16		-21		441	
11		95		58		3364	
12		42		5		25	
13		25		-12		144	
14	1	37				1080	4
15		Avg				Variance	
16						=AVERAGE(F3:F11)	