

Working with PivotTables

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There are many ways to analyze worksheet data, including sorting and filtering records. This chapter explains how to use a PivotTable to analyze data ranges.

A PivotTable is usually the best way to summarize and analyze data ranges or tables. PivotTables are good for grouping or expanding levels of data, switching columns and rows (“pivoting” data), and filtering and sorting. They lend themselves particularly well to summarizing long lists of data that need to be summed.

This chapter explains how to create PivotTables, modify their structure, and create PivotCharts that graphically illustrate PivotTables.

Using Exercise Files

This chapter suggests exercises to practice the topic of each lesson. There are two ways you may follow along with the exercise files:

- Open the exercise file for a lesson, perform the lesson exercise, and close the exercise file.
- Open the exercise file for a lesson, perform the lesson exercise, and keep the file open to perform the remaining lesson exercises for the chapter.

The exercises are written so that you may “build upon them”, meaning the exercises in a chapter can be performed in succession from the first lesson to the last.

Creating a PivotTable

To create a PivotTable, you need to decide which fields you want to include, how you want your PivotTable organized, and what types of calculations your PivotTable should perform.

Don't worry if PivotTables are confusing at first, they will make a lot more sense once you've actually created one.

1. Select a cell in a data range.

Other Ways to Create a PivotTable:

Select a cell in a table, click the **Design** tab on the Ribbon, and click the **Summarize with Pivot** button in the Tools group.

2. Click the **Insert** tab on the Ribbon and click the **PivotTable** button in the Tables group.

The Create PivotTable dialog box appears and a moving dashed line appears around the data range that Excel will use for the PivotTable.

- ✓ **Tip:** The data range doesn't have to be in the current workbook. Select the **Use an external data source** option to select data outside the workbook.

3. If necessary, select the data range you want to analyze, including column labels.

Next you need to decide if you want to display the PivotTable in a new worksheet or one that already exists in your workbook.

4. Select where you want the PivotTable report to be placed.

You can choose a new or existing worksheet.

- ✓ **Tip:** If you select Existing Worksheet, click the **Collapse Dialog** button and select the worksheet and upper-left cell of the range where you want to put the PivotTable.

5. Click **OK**.

The Excel window changes to display the structure for a new PivotTable, along with the PivotTable Field List task pane. No data has been pulled into the PivotTable yet—you'll need to use the task pane to tell Excel how you want to lay out the PivotTable.

✓ Tips

- ✓ You can change how the PivotTable Field List task pane looks. Click the button arrow near the top right corner of the task pane and select a layout option.

Exercise

- **Exercise File:** TripSales10-1.xlsx
- **Exercise:** Create a PivotTable on a new worksheet using the data from the Promotion Sales worksheet.

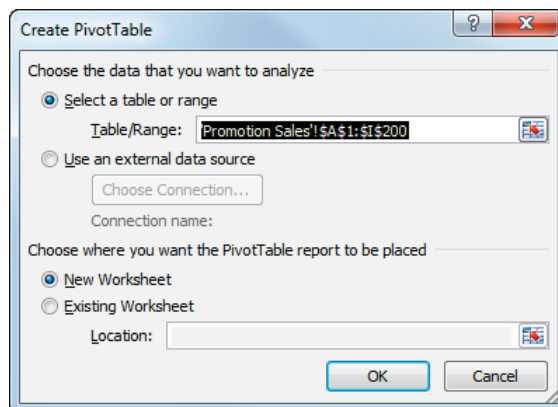


Figure 10-1: The Create PivotTable dialog box.

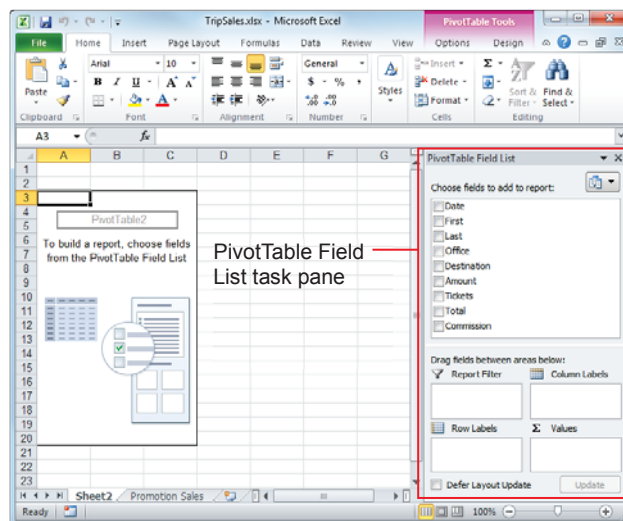


Figure 10-2: Creating a new PivotTable.

Specifying PivotTable Data

Once you've created your PivotTable, you have to specify the data you want to analyze. You'll simply select the fields you want to display in the PivotTable Field List, then adjust the layout by dragging them between the desired report areas at the bottom of the task pane. You're not going to understand how to do this unless you try it—so let's get started!

Add fields

1. Click the check boxes next to the fields you want to use as data in the PivotTable.

By default, nonnumeric fields are added to the Row Labels area, numeric fields are added to the Values area, and OLAP date and time hierarchies are added to the Column Labels area. However, the fields can be rearranged to other areas.

Other Ways to Add Fields:

Right-click a field name and select the layout area to which you want to add the field. Or, click and drag a field name into a layout section.

Rearrange fields

1. Click and drag fields between the areas in the task pane to reposition the PivotTable layout.

The data and layout of the PivotTable change accordingly.

Tips

- ✓ Drag a field between the Row Labels and Column Labels boxes to change the orientation of the PivotTable.
- ✓ You can change PivotTable labels by typing a new label.

Exercise

- **Exercise File:** TripSales10-2.xlsx
- **Exercise:** Add the Office, Destination, and Tickets fields to the PivotTable.
Move the Office field to the Column Labels area.
Switch the positions of the Office and Destination fields.

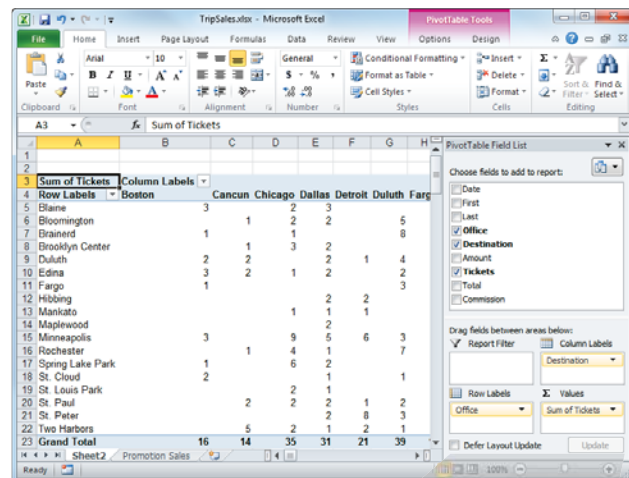


Figure 10-3: A PivotTable with data.

The field section is where fields are added and removed in the PivotTable.

The layout section is where fields are rearranged in the PivotTable.

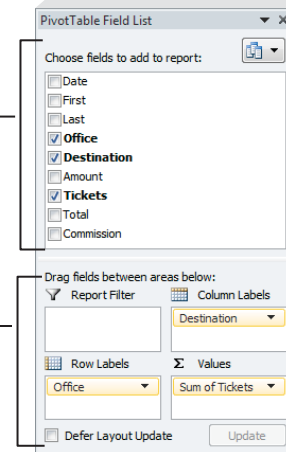
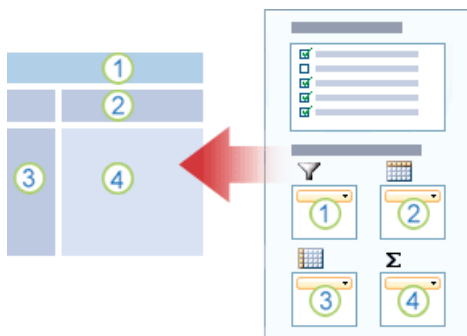


Figure 10-4: This diagram illustrates how areas in the PivotTable Field List correspond to areas in the PivotTable report.



- 1 The report filter area.
Move a field to this area, then select the criteria by which you want to filter the PivotTable.
- 2 The Column Label area.
- 3 The Row Label area.
- 4 The Results area.
The results include data that from the fields in the column and row areas. Results are also filtered from the report filter area.

Changing a PivotTable's Calculation

Besides adjusting the layout of your PivotTable data, you can also change how a PivotTable summarizes values. For example, you might want a PivotTable to display averages instead of totals.

1. Make sure the cell pointer is located in the PivotTable.
To change the calculation in a PivotTable, you need to change the value field settings.
2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **Field Settings** button in the Active Field group.
The Value Field Settings dialog box appears, displaying the “Summarize by” tab. Here you can select calculation options including Sum, Count, Average, or Max, among others.
3. Select the type of calculation you want to use to summarize the value data from the list.
4. Click **OK**.

The summarized value data in the PivotTable changes to using the new calculation.

Exercise

- **Exercise File:** TripSales10-3.xlsx
- **Exercise:** Change the calculation of the Tickets field from Sum to Max.
Change it back to Sum.

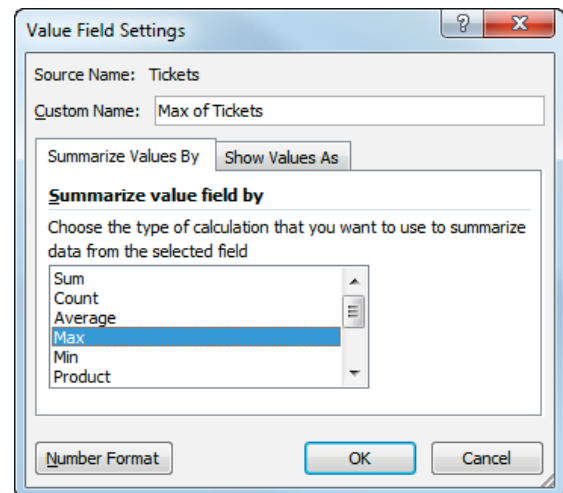


Figure 10-5: The Value Field Settings dialog box.

Filtering and Sorting a PivotTable

Much like you can with basic data ranges and tables in Excel, you can filter and sort data in a PivotTable.

Filter a PivotTable

1. Select a cell in the PivotTable.

The Options and Design tabs appear under PivotTable Tools on the Ribbon.

2. Click the filter button for a row or column label.

A list sorting and filtering options appears. The bottom area of the list displays criteria by which you can filter.

Other Ways to Select Filter Criteria:
Click the **Search** box in the filter list and type the criteria by which you want to filter. The list displays criteria that match your search.

3. At the bottom of the list, click the check boxes next to the fields you want to filter out to uncheck them.

Fields with checkmarks next to them will remain, while those without checkmarks will be filtered out.

4. Click **OK**.

The PivotTable is updated.

Other Ways to Filter a PivotTable:
Drag a field into the Report Filter area of the PivotTable Field List task pane. Click the field's filter button above the PivotTable and select what you want to filter by. Or, click a filter button, point to **Label Filters** or **Values Filters**, and select a filtering option.

Sort a PivotTable

1. Select a cell in the PivotTable.

The Options and Design tabs appear under PivotTable Tools on the Ribbon.

2. Click a filter button.

Here you'll see sort options at the top of the list, along with the filter options toward the bottom.

3. Select a sort option.

Other Ways to Sort:
Click the **Options** tab on the Ribbon. Click the button you want to use in the Sort group.

Exercise

- **Exercise File:** TripSales10-4.xlsx
- **Exercise:** Use the Row Labels filter button to display only records from Blaine. Clear the filter.

Try another way to filter: Add the Commission field to the Report Filter area of the PivotTable Field List and filter the PivotTable so only commissioned sales appear. Clear the filter.

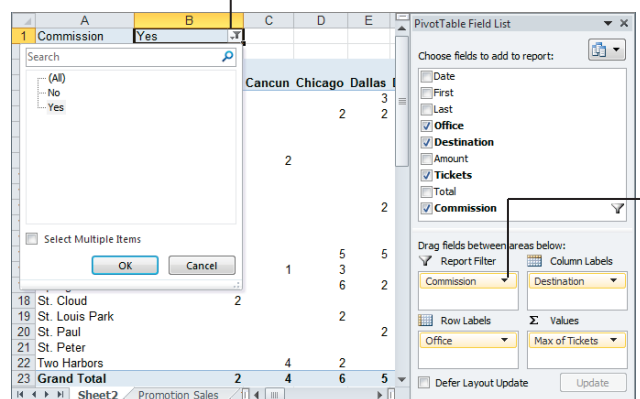
Sort the PivotTable by Office (Row Labels) from Z to A, then sort again from A to Z.

The filter button changes to make you aware that a filter has been applied.

	A	B	C	D	E	F	G
3	Max of Tickets	Column Labels					
4	Row Labels	Boston	Chicago	Dallas	Fargo	Grand Total	
5	Blaine	2	2	3	2	3	
6	Grand Total	2	2	3	2	3	
7							
8							
9							
10							
11							
12							

Figure 10-6: The PivotTable filtered to display only "Blaine" records.

Click the list arrow to choose how you want to filter the PivotTable.



Drag fields you want to filter for to this area.

Figure 10-7: Adding a field to the Report Filter area.

Working with PivotTable Layout

There are several options for altering the layout of your PivotTable and the PivotTable Field List task pane.

Adjust PivotTable Field List layout

You can change the layout of the PivotTable Field List makes it easier to work with. For example, you can display only the fields section if you have a long list of fields to choose from. Or, if you are done setting up the PivotTable, you can display only the area section.

1. Select a cell in the PivotTable.
The PivotTable Field List task pane appears.
2. Click the **layout** button at the top of the PivotTable Field List task pane and select a layout option.

You can choose to display only the fields section, only the report areas section, or both sections in different arrangements. The table below and to the right, *PivotTable Field List Layout Options*, has more information about these arrangements.

Show/Hide PivotTable elements

You can change which elements are displayed in the PivotTable.

1. Select a cell in the PivotTable.
The Options and Design tabs appear under PivotTable Tools on the Ribbon.
2. Under PivotTable Tools on the Ribbon, click the **Options** tab.
The Show/Hide group contains three buttons. By default, they are all shown in the PivotTable.
 - **Field List:** Show or hide the PivotTable Field List task pane.
 - **+/- Buttons:** Show or hide the +/- buttons that allow you to expand or collapse multi-level PivotTable items.
 - **Field Headers:** Show or hide column and row field headers.
3. Click the button you want to use in the Show/Hide group.

If the button is an orange color, the element is displayed in the PivotTable. If the button is not orange, the element is hidden.

Exercise

- **Exercise File:** TripSales10-5.xlsx
- **Exercise:** Change the layout of the PivotTable Field List so the field and area sections are side-by-side. Then change them back to stacked.
In the Show/Hide group of the Options tab on the Ribbon, hide the Field List and Field Headers. Show both again.
In the Layout group of the Design tab on the Ribbon, turn off the row and column grand totals. Enable them again.
Change the report layout to Tabular Form.

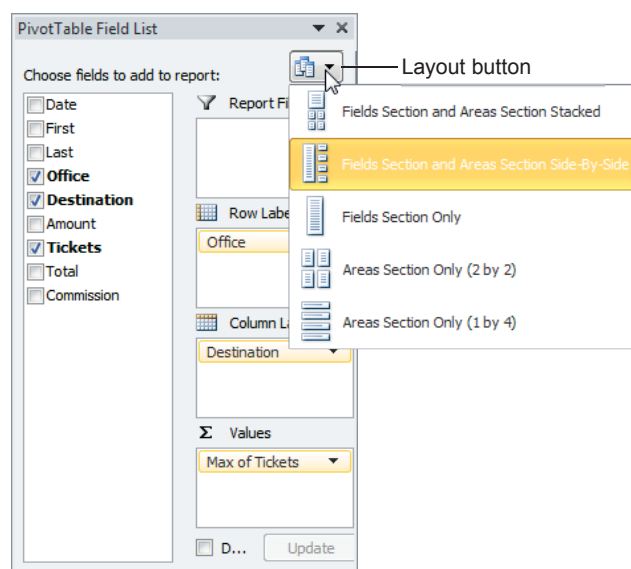


Figure 10-8: Changing PivotTable Field List layout.

Table 10-1: PivotTable Field List Layout Options

	This is the default layout. The fields are stacked above the areas.
	The fields appear side by side with the areas. This is useful if there is a long list of fields to choose from.
	Only the fields list is displayed. This is ideal if you only need to work with adding fields to the PivotTable report.
	Only the areas are displayed (2 by 2). This is ideal if the fields you want have been added and you want to work with the report's layout.
	Only the areas are displayed (1 by 4). This is ideal if the fields you want have been added and you want to work with the report's layout.

Layout group on the Design tab

The Layout group on the Design tab allows you to change what elements appear on the PivotTable.

1. Select a cell in the PivotTable.

The Options and Design tabs appear under PivotTable Tools on the Ribbon.

2. Under PivotTable Tools on the Ribbon, click the **Design** tab.

Here you can see the Layout group. It contains four buttons:

- **Subtotals:** Click to show or hide subtotals, and to specify where to show them.
- **Grand Totals:** Click to show or hide grand totals, and to specify whether they appear for rows, columns, or both.
- **Report Layout:** Show the PivotTable in compact, outline, or tabular form.
- **Blank Rows:** insert or remove a blank line between each grouped item in the PivotTable.

3. Click the button you want to use in the Layout group.

A list of options appears, depending on the button that was selected.

4. Select an option from the list.

The PivotTable layout is changed accordingly.

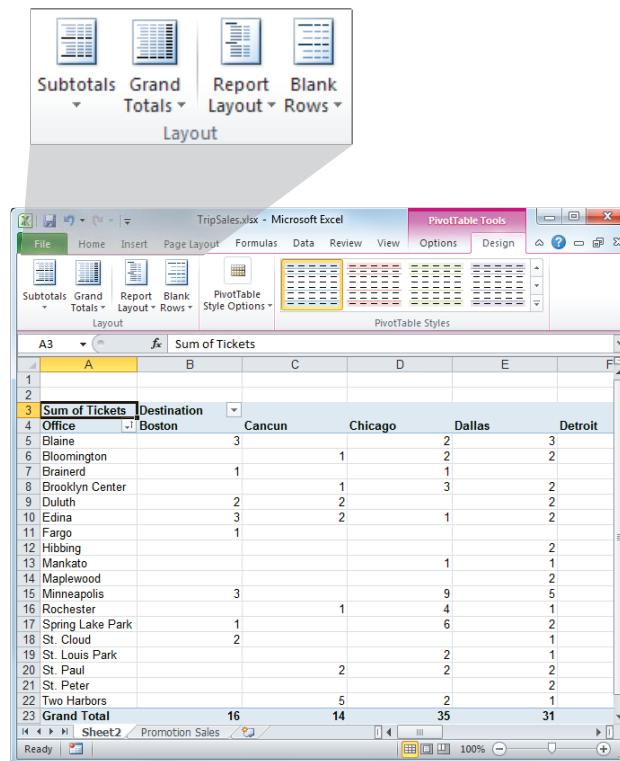


Figure 10-9: The layout of the PivotTable in Tabular layout, and the Layout group on the Design tab.

Grouping PivotTable Items

You can group PivotTable data in order to set it apart additional subsets of data. You can group most items, but dates are a common item to group. For example, you may want to group the information in the PivotTable by days, months, quarters, or years.

Group dates or times

1. Select the date or time field in the PivotTable.

To select the field, click the name of the field in the PivotTable, such as the row or column header.

2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **Group Field** button in the Group group.

The Grouping dialog box appears.

3. Specify the starting and ending dates you want to group and the interval you want to group by.

By default, the starting and ending dates are the first and last dates in the PivotTable.

4. Click **OK**.

The grouping is applied to the PivotTable report.

- ✔ **Tip:** To group dates by weeks, select **Days** in the By area of the Grouping dialog box and enter **7** in the Number of days box.

Group numeric items

1. Select the numeric field in the PivotTable that contains the data you want to group by.
2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **Group Field** button in the Group group.

The Grouping dialog box appears.

3. Specify the starting and ending values you want to group and the interval you want to group by, then click **OK**.

Group other selected items

You can also group items that are not dates or numeric data, such as labels.

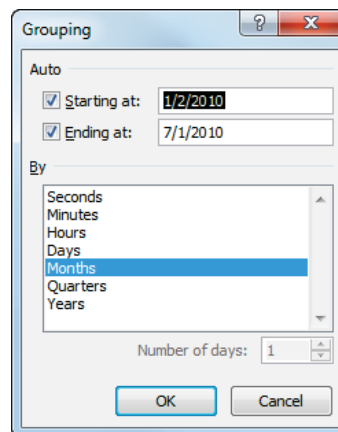
1. Select the items in the PivotTable that you want to group.

Exercise

- **Exercise File:** TripSales10-6.xlsx
- **Exercise:** First, set up the PivotTable for grouping: Remove the Office field from the Row Labels area of the PivotTable Field List. Move the Destination field to the Row Labels area. Add the Date field to the Column Labels area. Select cell B3 and group the dates by month. Then ungroup the dates.

	A	B	C	D	E	F
1						
2						
3	Sum of Tickets	Date				
4	Destination	1/2/2010	1/3/2010	1/4/2010	1/5/2010	1/8/2010
5	Boston	2				
6	Cancun					
7	Chicago		1			
8	Dallas				2	
9	Detroit				2	
10	Duluth			2		
11	Fargo					
12	Houston					
13	Lincoln					

1. Select the field by which you want to group. This example happens to group by the Date field.



2. Select the increment by which you want to group. This example will group the data so it is displayed by month, rather than by day.

	A	B	C	D	E	F
1						
2						
3	Sum of Tickets	Date				
4	Destination	Jan	Feb	Mar	Apr	May
5	Boston	6	1	3	2	2
6	Cancun	2	2	8		
7	Chicago	5	7	9	9	5
8	Dallas	4	4	10	4	4
9	Detroit	6		12	1	2
10	Duluth	10	7	6	1	4
11	Fargo	2		4	1	7
12	Houston	2	1	6	5	
13	Lincoln	2	5	3	2	

3. The data for each month is grouped together under one column, rather than being shown as separate days.

Figure 10-10: Grouping the PivotTable dates by month.

2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **Group Selection** button in the Group group.

The items are grouped and collapse buttons appear so you can collapse or expand the group of data.

✔ **Tip:** You can also use this method to group specific items in a field.

Ungroup items

1. Select the items in the PivotTable that you want to ungroup.
2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **Ungroup** button in the Group group.

The items are ungrouped.

Updating a PivotTable

If you make changes to the source data a PivotTable is based on, the PivotTable isn't automatically updated. Instead you must manually refresh the PivotTable anytime you change its underlying source data. This lesson explains how to do that, as well as how to change the source of the data the PivotTable is based on.

Refresh PivotTable data

If you've made changes to the data what your PivotTable pulls from, you need to refresh the PivotTable to update it.

1. Select a cell in the PivotTable.

The PivotTable Tools are displayed on the Ribbon.

2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **Refresh** button in the Data group.

The PivotTable updates to include any changes to the source data.

Change PivotTable data source

You can easily change which data is used by the PivotTable.

1. Select a cell in the PivotTable.

The PivotTable Tools are displayed on the Ribbon

2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **Change Data Source** button in the Data group.

The Change PivotTable Data Source dialog box appears, along with the current data source—which has a moving dotted line around it.

3. Select a new data range.

4. Click **OK**.

The PivotTable updates with the data from the new source range.

Exercise

- **Exercise File:** TripSales10-7.xlsx
- **Exercise:** View the Promotion Sales worksheet and change the value in cell G2 to 5. Return to the PivotTable on Sheet2 and refresh the PivotTable. The data updates in C23. Change the PivotTable data source so that it uses only the range A1:G4 on the Promotion Sales worksheet.

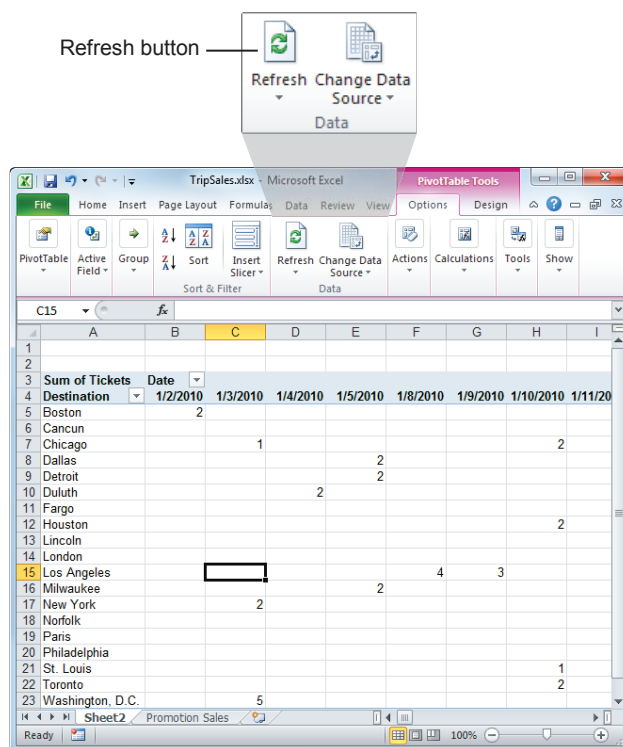


Figure 10-11: The Data group on the Options tab.

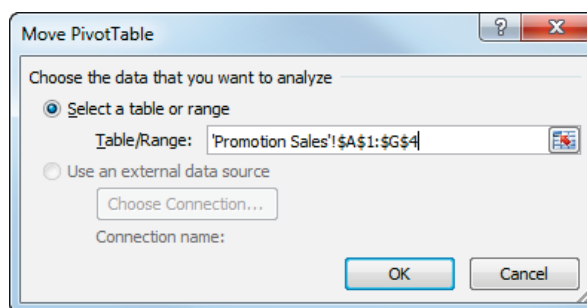


Figure 10-12: The Change PivotTable Data Source dialog box.

Formatting a PivotTable

You can quickly format a PivotTable with Excel's built-in styles and style options.

Apply a built-in style

1. Select a cell in the PivotTable.

The PivotTable Tools are displayed on the Ribbon.

2. Click the **Design** tab and select a style in the PivotTable Styles group.

The PivotTable is formatted with the style you selected.

- ✓ **Tip:** Click the **More** button in the PivotTable Styles group to display an expanded PivotTable Styles gallery.

Work with style options

Besides applying a style to the table, you can select PivotTable style options that allow you to adjust the format for a part of a PivotTable. For example, you can apply special formatting to row headers or make the columns banded.

1. Select a cell in the PivotTable.

The PivotTable Tools are displayed on the Ribbon.

2. Click the **Design** tab and select an option in the PivotTable Style Options group.

Here is a brief description of the style options you can select from in the PivotTable Style Options group:

- **Row/Column Headers:** Displays special formatting for the first row or column of the PivotTable.
- **Banded Rows/Columns:** Applies different formatting to alternate rows or columns.

✓ Tips

- ✓ Besides using the formatting options on the Design tab, you can format a PivotTable using general formatting commands found on the Home tab.

Exercise

- **Exercise File:** TripSales10-8.xlsx
- **Exercise:** Apply Pivot Style Medium 24 from the PivotTable Styles gallery.
Select the Banded Rows style option and deselect the Column Headers option.

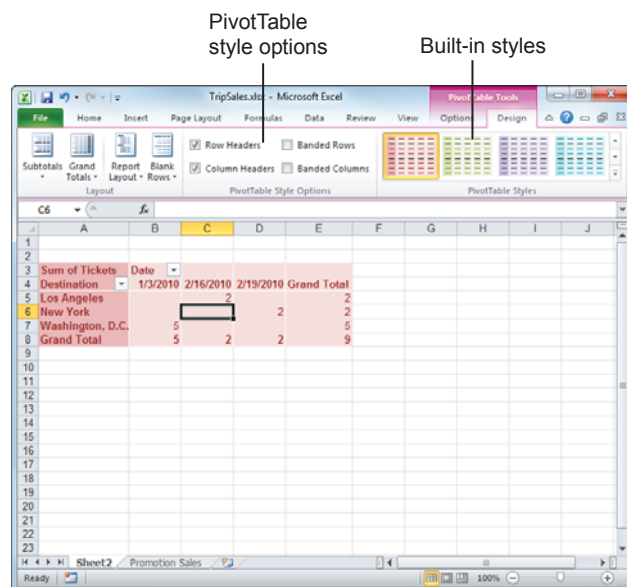


Figure 10-13: Selecting a built-in PivotTable style from the PivotTable Styles group.

	A	B	C	D	E	F
1						
2						
3	Sum of Tickets	Date				
4	Destination	1/3/2010	2/16/2010	2/19/2010	Grand Total	
5	Los Angeles		2		2	
6	New York			2	2	
7	Washington, D.C.	5			5	
8	Grand Total	5	2	2	9	
9						
10						
11						

Figure 10-14: The PivotTable report with the updated style and style options.

Creating a PivotChart

A PivotChart is similar to an ordinary chart created in Excel, except that it plots a PivotTable's information. Like PivotTable reports, PivotCharts are dynamic, which means you can change a PivotChart's structure.

1. Select a cell in the PivotTable.

The PivotTable Tools are displayed on the Ribbon.

2. Under PivotTable Tools on the Ribbon, click the **Options** tab and click the **PivotChart** button in the Tools group.

The Insert Chart dialog box appears, displaying different types of charts.

3. Select the type of chart you want to use and click **OK**.

The chart appears in the worksheet with your PivotTable.

✓ **Tip:** Click and drag the PivotChart's border to move the chart around in the worksheet.

4. Modify the chart using the PivotChart Filter Pane and the PivotTable tools.

✓ Tips

- ✓ If you modify the PivotTable, the PivotChart will change also.
- ✓ More detailed information about modifying and formatting charts can be found in the "Creating and Working with Charts" chapter.

Exercise

- **Exercise File:** TripSales10-9.xlsx
- **Exercise:** Insert a Clustered Column PivotChart.

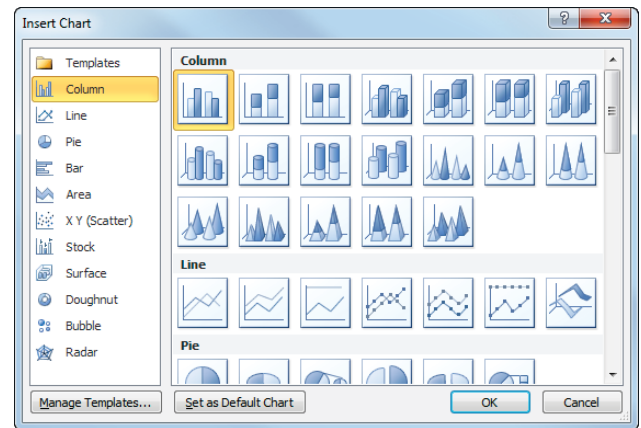
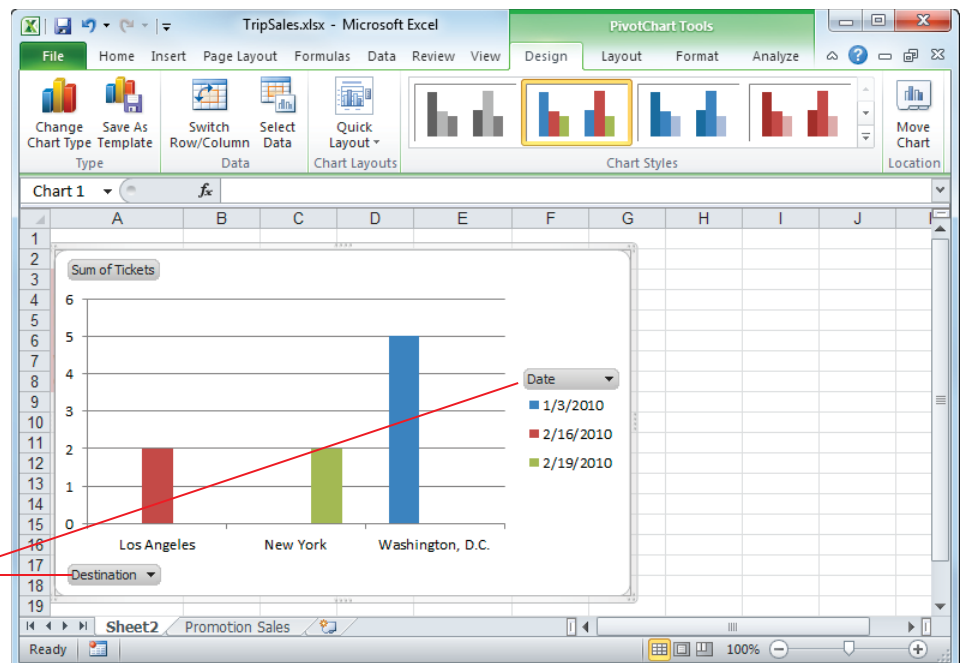


Figure 10-15: The Insert Chart dialog box.

Figure 10-16: A clustered column PivotChart.

Click the row or column filter buttons to filter the data shown in the PivotChart.



Using Slicers

Slicers are a new feature in Excel 2010 that has been added in order to provide an easy way to filter PivotTable data. Slicers label the filters applied, with details, so you can easily understand the data that is displayed and filtered in the PivotTable report.

Create a PivotTable Slicer

Here's how to create a slicer in an existing PivotTable.

1. Click the PivotTable report to select it.

The PivotTable Tools contextual tabs appear on the Ribbon.

2. Click the **Options** tab under PivotTable Tools on the Ribbon and click the **Insert Slicer** button in the Sort & Filter group.

The Insert Slicers dialog box appears. All the fields in your PivotTable are listed here; you decide which fields you want to filter by in the PivotTable.

3. Click the check box of the PivotTable fields by which you wish to filter.

Keep in mind that you'll get a separate slicer for each field you select.

4. Click **OK**.

The slicer(s) appear above the PivotTable. You can move a slicer to another location on the worksheet, and resize it as needed.

Exercise

- **Exercise File:** Slicers1.xlsx; Sheet1
- **Exercise:** View the number of tickets the St. Cloud office sold to Boston, New York, and Washington D.C.
(Insert slicers for the Destination and Office fields. Select the St. Cloud button in the Office slicer. Select the Boston, New York, and Washington, D.C. buttons in the Destination slicer.)

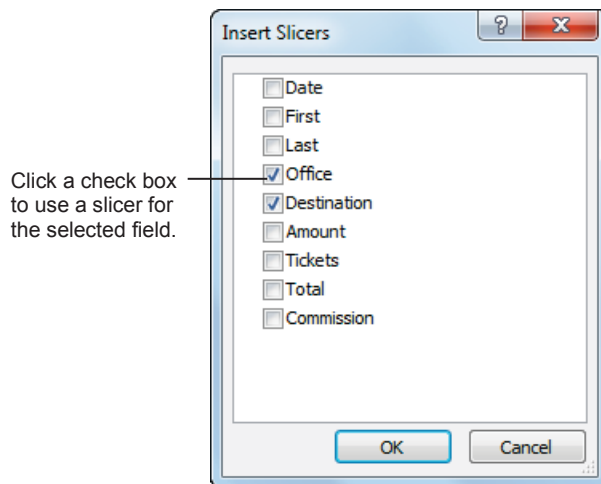
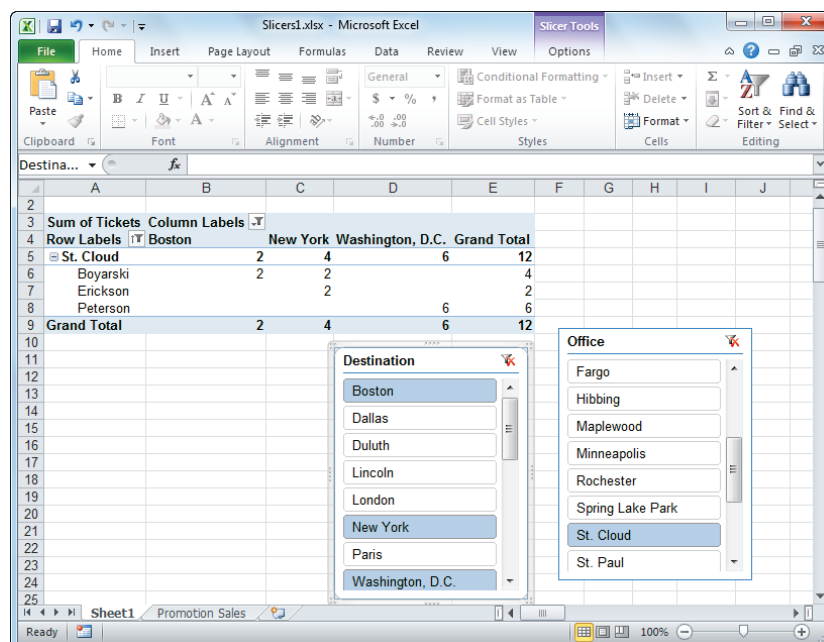


Figure 10-17: The Insert Slicers dialog box.

Figure 10-18: The PivotTable with two slicers applied.



Filter data using a slicer

After you create a slicer, it appears on the worksheet alongside the PivotTable, in a layered display if you have more than one slicer.

1. Click a button in a slicer. Press and hold the **<Ctrl>** or **<Shift>** keys to select multiple buttons.

The button is selected, and the PivotTable data is filtered accordingly.

✔ **Tip:** Simply click the button again to stop filtering out the selected data.

Format a slicer

You can change the appearance of a slicer to match the color scheme of your PivotTable.

1. Click the slicer you want to format.
The Slicer Tools appear on the Ribbon.
2. Click the **Options** tab under Slicer tools on the Ribbon and select the style you want in the Slicer Styles group.

The style is applied to the slicer.

✔ **Tip:** You can also click the **More** button in the Slicer Styles group to view more styles.

Delete a slicer

If you no longer want to filter PivotTable data, you can remove the slicer completely.

1. Click the slicer and press **<Delete>**.

The slicer no longer appears in the worksheet.

🔗 **Other Ways to Delete a Slicer:**
Right-click the slicer, and then select **Remove** **<Name of slicer>** from the contextual menu.

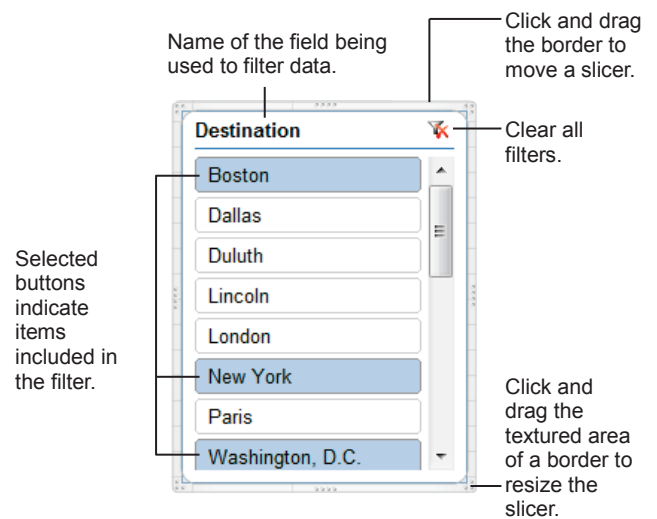


Figure 10-19: Anatomy of a slicer.

Sharing Slicers Between PivotTables

If you're working with a workbook that has several different PivotTables, it's likely that you'll want to apply the same filter to other PivotTables. This lesson shows you how to share slicers between PivotTables in a workbook.

Apply a slicer to another PivotTable

If you want to use a slicer in another PivotTable, you have to make the slicer available to that PivotTable.

1. Click the slicer that you want to share in another PivotTable.

The Slicer Tools appear on the Ribbon.

2. Click the **Options** tab under Slicer Tools on the Ribbon and click the **PivotTable Connections** button.

The PivotTable Connections dialog box appears. Other PivotTables you can share the slicer with are listed.

3. Click the check boxes of the PivotTables in which you want the slicer to be available.

4. Click **OK**.

The slicer is now applied to the selected PivotTable(s).

Exercise

- **Exercise File:** Slicers2.xlsx, Sheet2
- **Exercise:** Apply the Destination slicer from PivotTable 1 to PivotTable 2.

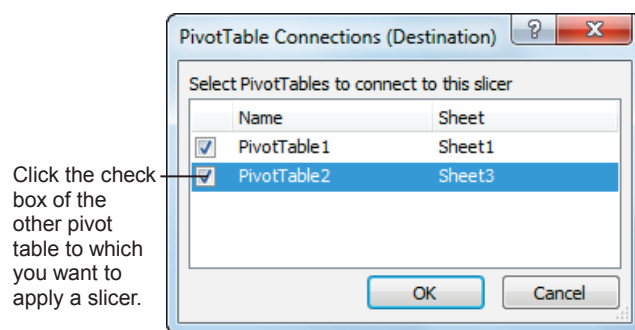


Figure 10-20: The PivotTable connections dialog box.