

Microsoft® Excel 2007

Pivot Table Reports

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Microsoft® Excel 2007 - Pivot Table Reports

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Lesson 1: Pivot tables reports: What they are

Pivot table reports are two-dimensional tables used to summarise large amounts of data. The data will normally be in the form in a long list consisting of 3 or more columns.

(You can also use data from sources outside Microsoft Excel, but this will not be covered in this course.)

Once created the Pivot table report can be quickly changed to show different variations of the summarised data.

An example of a simple Pivot Table report is shown below right, while the source data is shown below left.

Mangos eaten during first week of December 2005		
Name	Date	Number
Donald Duck	1-Dec	1
Roger Rabbit	1-Dec	1
Pooh Bear	2-Dec	3
Roger Rabbit	1-Dec	0.5
Goofy	1-Dec	2.5
Pooh Bear	2-Dec	1
Donald Duck	1-Dec	5
Roger Rabbit	2-Dec	3
Donald Duck	2-Dec	1
Pooh Bear	1-Dec	1
Pooh Bear	1-Dec	4
Goofy	2-Dec	1
Goofy	2-Dec	1
Simba	4-Dec	1
Pooh Bear	5-Dec	2.5
Mickey Mouse	5-Dec	0.5
Goofy	6-Dec	1.75

Sum of Number	Date					
Name	1-Dec	2-Dec	4-Dec	5-Dec	6-Dec	Grand Total
Donald Duck	6	1				7
Goofy	2.5	2			1.75	6.25
Mickey Mouse				0.5		0.5
Pooh Bear	5	4		2.5		11.5
Roger Rabbit	1.5	3				4.5
Simba			1			1
Grand Total	15	10	1	3	1.75	30.75

These reports are extremely useful when you wish to compare related totals which must be obtained from a long list of figures. Pivot table reports will do sorting, subtotaling and totalling automatically.

Pivot table reports can also be used to summarise or *consolidate* data of the same kind on different sheets (this can also be done in other ways).

e.g. The information on the two sheets shown left and centre can be consolidated as shown right.

Item	Quantity
Black biro	34
Blue Biro	29
Pencil	1
Diary - week view	6
Diary - page view	3
Calendar	1
Paper	6

▶ ▶ \ January \ February

Item	Quantity
Diary - page view	3
Black biro	25
Calendar	6
Paper	1
Diary - week view	6

▶ ▶ \ January \ February

Page1	(All)	
Sum of Value	Column	
Row	Quantity	Grand Total
Black biro	59	59
Blue biro	29	29
Calendar	2	2
Diary - page view	6	6
Diary - week view	12	12
Paper	12	12
Pencil	1	1
Grand Total	121	121

Lesson 2: Creating source data.

Source data would be in the form of a list with rows and columns. For a normal Pivot table Report you would have at least 3 columns, for a consolidating Pivot table Report you only need two.

Microsoft Excel uses the data in the first row of the list for the field names (i.e. row and column headings etc) in the report so you must include labels for your columns.

Data must always be stored under the relevant heading e.g. date in the date column etc.

Note that in the example shown right the Native Country is always in column B and the Native Language in Column D, etc.

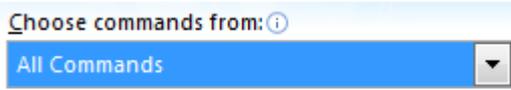
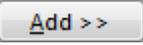
	A	B	C	D	E
1	Name	Native Country	Working Country	Native Language	Language learning
2	John Smith	UK	China	English	Mandarin
3	Alison Byers	UK	Calabar	English	Swahili
4	Mark Best	UK	Nyasaland	English	Swahili
5	Alan Charter	UK	Burma	English	Burmese
6	Ellen Terry	UK	India	English	Indian
7	James Werths	UK	China	English	Cantonese
8	Amy Dredet	UK	China	English	Mandarin
9	Petronella Villers	UK	China	English	Mandarin
10	Andrew van Dyme	Holland	International	Dutch	English
11	Fred Camel	USA	Ecuador	English	Spanish
12	Elsa Janes	USA	Ecuador	English	Spanish
13	David Wilker	USA	USA	English	None
14	Bette ten Boom	Holland	International	Dutch	English

Lesson 3: Using a Data Form

Once you have set up the column headings you can use a form to enter the data. This is especially useful where there are many columns – but note that the maximum number of columns the Form can handle is 32.

Add the Form button to the Quick Access toolbar

The button for the form does not appear anywhere by default, so we need to add it to the Quick Access toolbar at the top left of your Excel Window

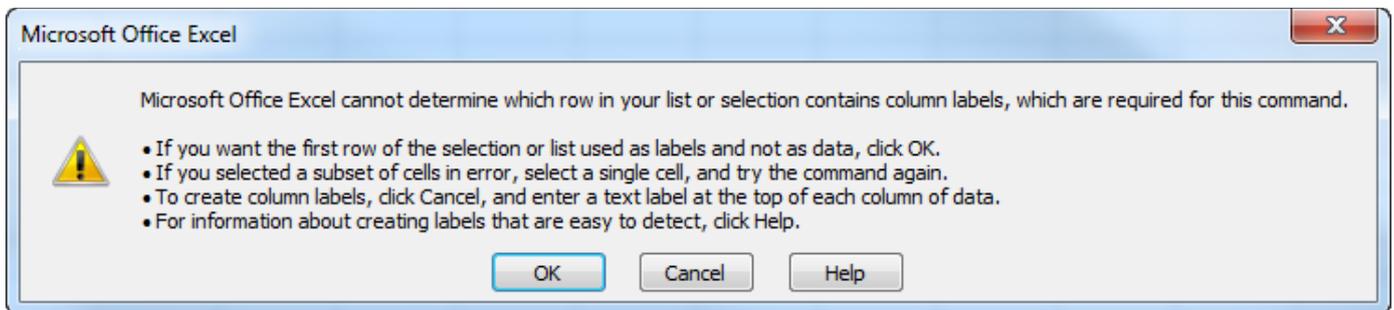
1. Click the down arrow at the right 
2. Then select **More Commands...**
3. Change the option **All Commands** to show All Commands 
4. Scroll through the list and look for **Form**
5. Click **Add >>** 
6. Click **OK** 

You will now see the Form button  on the Quick Access toolbar 

Using the Data Form

Place your cursor in the headings and click the **Form** button

If you have only the headings you will see the message shown right



Since you want the first row to be treated as headings, click **OK**

A form will then appear (as shown right for the above example)

Type the data in the relevant boxes and click

New to create a new row of data. The new data is placed at the bottom of the list.

You can use **Find Prev** and **Find Next** to move between the different rows (or records).

Click **Close** to stop using the Form

Lesson 4: Create a summarising Pivot Table Report

When you have source data you can create the pivot table report!

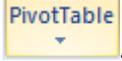
Click on a cell within the information you wish to summarise

The Pivot Table icon

On the left of the **Insert** ribbon you will see the Pivot Table icon (shown right)



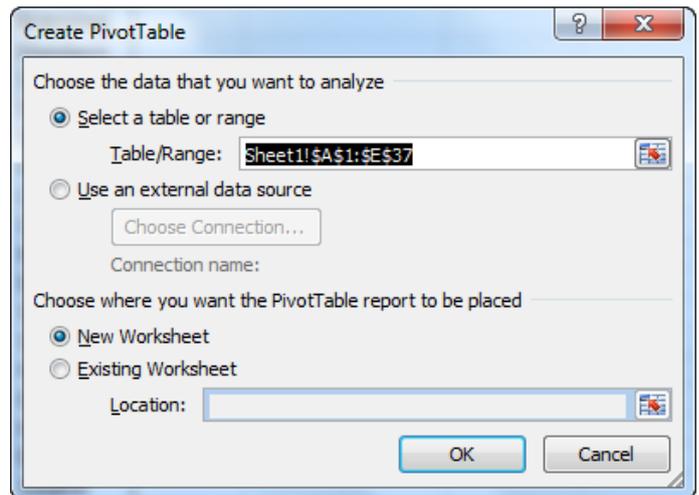
Note that there are two parts to the icon. The top part,  and the bottom part



. To set up a Pivot table you can click the top part. (the bottom part allows you to set up a Pivot Chart – covered in Lesson 25:)

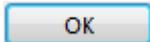
Creating a summarised Pivot table

1. Place your cursor within the data you want to use for the pivot table
2. On the **Insert** ribbon click the **Pivot Table** icon
3. The dialogue box shown right appears,
 - The correct range should be shown. If it is not, make sure your cursor is in the **Range** box and select the correct range from the spreadsheet
 - Click **New worksheet** if you wish to have the Pivot Table Report shown on a new sheet that Microsoft Excel will create,

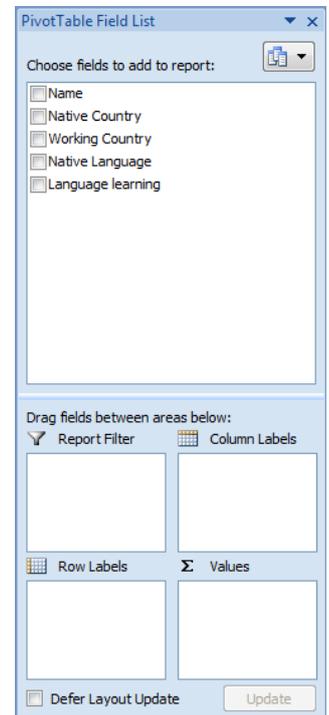
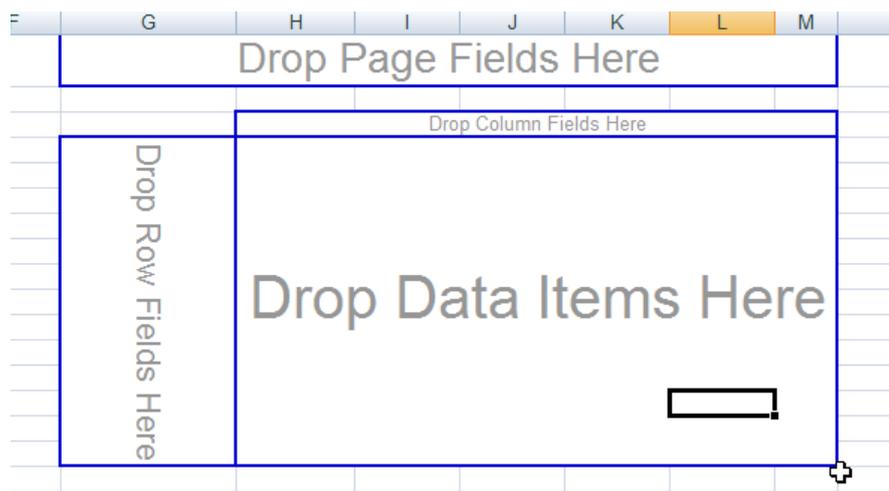


or click **Existing worksheet** to place the Pivot table on the same sheet as the source data (or another existing sheet). You must then click in the **Location** box and click a cell on the spreadsheet on which you want the Pivot table to appear. Note the cell you click will be the top left cell of the pivot table (always leave two blank lines above the starting cell to allow for a **Report Filter** row)

Click



You will now see a blank pivot table frame (as shown below) with the Pivot Table Field List at the right of the window (shown right). Note that if you move your cursor outside the pivot table area the pivot table Field List will disappear. Just click back inside the pivot table to see it again



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You must now decide which data columns to use in your pivot table and where. Click on the relevant column heading where it is shown in the pane and drag it into the required position on the pivot table frame. (Note that once a field has been used it will be shown in bold and ticked in the **Pivot Table Field list** e.g. **Native Country**)

e.g. drag **Working Country** into the *Drop Column fields here* area and **Native Country** into the *Drop Row Fields here* area

In this case we have 5 columns. Let's use Report Filters to view two other columns. (We could also have used them as second row or column fields) So drag **Language spoken** up to the *Drop page Fields here*

Then drag **Language learning** up to the same area, let's say, above **Native Language**

Lastly we can drag **Name** into the *Drop data Items here* area.

You will then see the completed pivot table as shown, for our example, right.

See the next Lesson to learn how to adjust the pivot table if you have placed the fields incorrectly

Some general rules for placement of fields are:

- The most changeable item is probably best as a *Row* field
- Usually any numerical fields go in the *data* area
- For data with only 3 columns the Row, Column and Data areas are used - you cannot use the Report Filter area.

Language learning	(All)					
Native Language	(All)					
Count of Name	Native Country					
Working Country	Holland	UK	USA	USSR	Grand Total	
Burma			1			1
Calabar			1			1
China			6			6
Congo			2			2
Ecuador				2		2
India			2	2		4
International	2			2		4
Nyasaland			1			1
USA				1		1
USSR					1	1
Grand Total		2	13	7	1	23

Notes

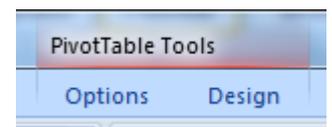
1. Excel automatically *counts* text data items (Names in the example above) and *sums* (adds up) any *numerical* data items.
2. You can drag more than one field to the row area, and/or more than one field to the column area – see the example shown right.

Sum of Number		time of day	Date				
		am		am Total	pm	pm Total	Grand Total
Where	Name	1-Dec	2-Dec	1-Dec	2-Dec		
Dining room	Donald Duck		1	1	5	5	6
	Goofy				1	1	1
	Pooh Bear		1	1	4	4	5
	Roger Rabbit	1		1			1
Dining room Total		1	2	3	9	10	13
Toolshed	Donald Duck	1		1			1
	Goofy		1	1	2.5	2.5	3.5
	Pooh Bear	1		3	4		4
	Roger Rabbit		3	3	0.5	0.5	3.5
Toolshed Total		2	7	9	3	3	12
Grand Total		3	9	12	12	13	25

Lesson 5: Naming the Pivot Table (using the ribbons)

Pivot Table ribbons

If your cursor is inside a pivot table you will see two extra tabs at the right of the tab bar, under the heading **PivotTable Tools**



If these disappear then just place your cursor back into the pivot table.

Naming the Pivot table

Click the **PivotTable Tools: Options** tab

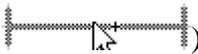
At the left you will see **PivotTable Name:** and Type in the name you wish to give the Pivot Table.



Lesson 6: Adjusting Pivot table fields

Adding fields to a Pivot table

Click on the field name on **Pivot table Field list** and drag it into the desired position

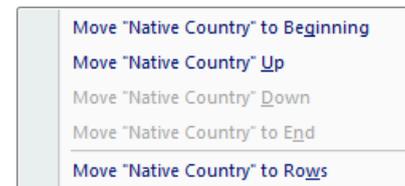
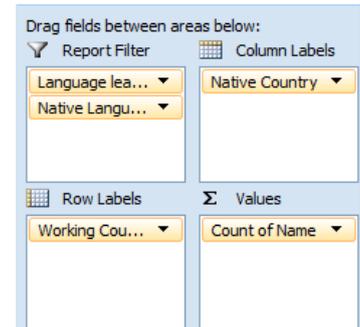
Make sure that the vertical or horizontal insertion bar (e.g. ) appears in the position in which you wish to insert the new field i.e. before or after an existing field, or that the area you wish to drag a field to is outlined with a dotted line if it is the first field you are adding to the area.

You can also drag fields between the boxes at the bottom of the **PivotTables Field List** and the table will update immediately

Using more than one data field

When creating the Pivot table you can drag more than one field into the data area. This will give a row under each heading for each data item.

If you have problems with the order of the data items you can right click on a data item and select **Move**. The menu shown right appears and you can use this to move the data item into the correct order



Removing fields from a Pivot table

To remove a field right click the field name and then click the **Remove** option (which will show the name of the field name, e.g. Remove Native Country)

You can also click the field name in the Pivot table, hold the left mouse button down  and drag away from the Pivot table until you see the cursor change as shown right. Release the mouse button.

Drill Down

Where there are two levels of row heading (as shown right) you can use the *drill down* method to choose whether to view details for the outer field

Click the  symbol to the left of **China** and the details **Cantonese** and **Mandarin** will become invisible and the data will be grouped.

 Calabar	Swahili	1
Calabar Total		1
 China	Cantonese	2
	Mandarin	6
China Total		8
 Congo	Swahili	2

e.g.

 Calabar	Swahili	1
Calabar Total		1
 China		8
 Congo	Swahili	2

Note: you can also double click **China** again to hide and show the details

Help! I closed the Pivot table field list!

Don't panic! Just go to the **PivotTable Tools**, Options ribbon, and in the **Show/Hide** group on the right of the ribbon click the click on  **Field List**. You can use this button to hide the field list too.

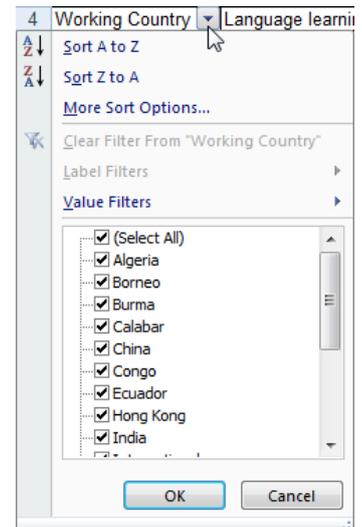
Lesson 7: Select relevant information from pivot tables

Once you have created the Pivot Table you will see that there are various headings that have down arrows to their right, e.g. **Working Country**. You can use these arrows to adjust the information that is on view.

Fields

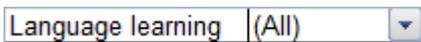
For example, if you click on the down arrow for the **Working Country** you will see a list of all the Sending Countries that exist in your source data. Note the scroll bar in the example shown right.

You can then click to remove from the table any country in which you are not interested and click **OK**.



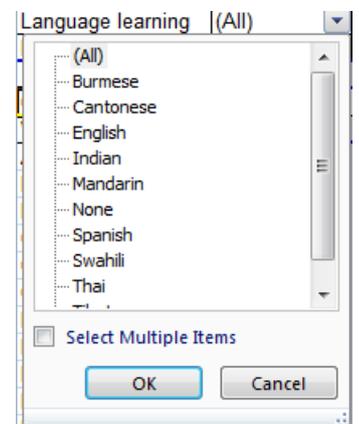
Report Filters

Report Filter fields are set to **All** by default. However, they also have a down arrow.



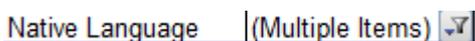
The choices look slightly different, since you are choosing which information you wish to view. Click **Burmese** see only data concerning Algeria. Click **All** to see a summary of all the data.

In this example information for **all language learning** data where the *native language* is **English**



Note that you can see clearly which information you are viewing

If you have chosen more than one Native language you will see



Language learning	(All)		
Native Language	English		
Count of Name	Native Country		
Working Country	UK	USA	Grand Total
China	7		7
Congo	2		2
International		2	2
Nyasaland	1		1
USA		1	1
Grand Total	10	3	13

Let us suppose that you are now arranging language classes for English Speakers who are learning Mandarin.

You can click on the down arrow beside **Language Learning**, click **Mandarin** and click **OK**.

Language learning	Mandarin		
Native Language	English		
Count of Name	Native Country		
Working Country	UK	Grand Total	
China	5		5
Grand Total	5		5

Lesson 8: Show details

When you look at the summarised data in a PivotTable you may feel that you want to see the individual items of data that make up one of the summarised figures.

e.g. in the example below, we may want to know who are the 4 people who work in China and are learning Mandarin.

You can double click the cell containing 4. A new sheet will open up, containing the 4 original rows of data that were used to create the total

Count of Name		Native Country
Working Country	Language learning	UK
China	Cantonese	2
	Mandarin	4

Name	Native Country	Working Country	Native Language	Language learning
John Smith	UK	China	English	Mandarin
Janet Cable	UK	China	English	Mandarin
Timothy Kranmer	UK	China	English	Mandarin
Petronella Villers	UK	China	English	Mandarin

You can then work with this data, or delete the sheet if you have no more interest in the data

Lesson 9: Pivot Table Report Options

So far we have created a simple Pivot table and accepted the options that Microsoft Excel chose.

There are various options you may wish to change, and one place to look is the **Options** dialogue box

On the **PivotTable Tools: Options** ribbon click  **Options**

Some useful options are explained below:

The Layout & Format tab

Name: It is good policy to name the Pivot Table as you may create more than one and it is easier to know what **Mangos eaten** means than **PivotTable2!**

Merge and center cells with labels: If you choose this option all labels will be centred vertically and horizontally across the cells to which they refer.

Thus

International	English
	None

Instead of

International	English
	None

Autofit column widths on update: if this is ticked the width of columns within the table will be adjusted every time the table is updated (when changes are made etc) This means that if you have changed the column widths manually those changes will be lost on update. If you want to keep your changes then make sure this option is not ticked.

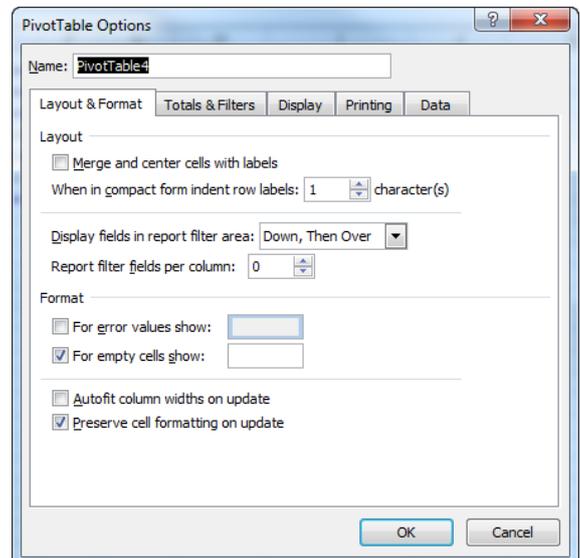
Preserve cell formatting on update see 0

The Total & filters tab

Grand totals: You can choose to show grand totals for the rows and/or columns

The Display tab

Show expand/collapse buttons You may not wish the  and  symbols to show – perhaps to discourage people from changing the view. Remove the tick here to hide them.



Classic PivotTable Layout: If this is not ticked then you cannot drag the headings around. E.g you could not drag a column to a row within the PivotTable. You can still do this change within the **PivotTable Field List** If you are passing the Excel file to others this may stop people playing too much with your Pivot Table.

Display item labels when no fields are in the values area: this applies only to PivotTables created in versions earlier than 2007.

The Printing tab

Print expand/collapse buttons You may not wish the  and  symbols to print. Remove the tick here to hide them.

Repeat item labels on each printed page and **set Print titles** will be covered in Lesson 22:

The Data tab

Save data with table layout: To produce the pivot table Microsoft Excel calculates new data. If this option is ticked Excel saves the data it has calculated which increases the size of the file. If it is not ticked the file size will be smaller, but on opening the file you must update the table before working with it. If you choose not to save the data click **Refresh on Open** to ensure that the table will automatically be updated when the file is opened. (if you have created the PivotTable from an external source then it is best to save the data with the file, in case the external data is accidentally deleted, moved etc)

Enable show details: if this is not ticked you will be unable to show details of a field by double clicking on it as explained in 0 You can use it to prevent people from seeing the underlying data.

Refresh data when opening the file this is important when data from an external source is used (e.g. a database).

Lesson 10: Delete a PivotTable

Click in the PivotTable

On the **PivotTable Tools Options** ribbon click **Entire PivotTable**.

On the **PivotTable Tools Options** ribbon click **Clear** and the **Clear All**,

On the **Home** ribbon click **Clear** (in the Editing Group) and then **Clear All**

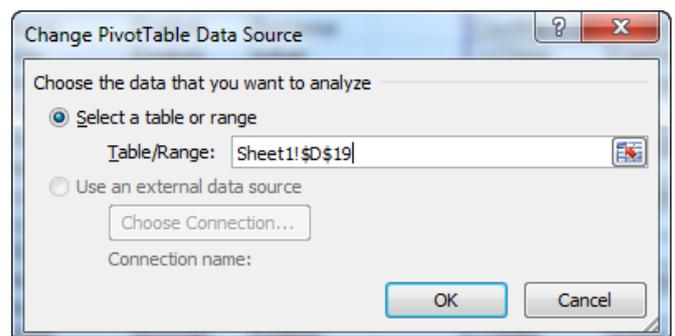
Lesson 11: Edit the source area used by the pivot table

If you have added data at the end of your list you will need to change the area you defined for the Pivot table source data. (If you have inserted rows or columns within the range you will merely need to refresh the data – see 0)

Click within the table

On the **PivotTable Tools Options** ribbon click **Change Data Source** (in the **Data** group)

Then click and drag to outline the new area (or simply hold the Shift key down on the keyboard and use the down and/or right arrow keys to extend the existing selection)



Lesson 12: Update or *refresh* data shown in the pivot table

When PivotTable Reports are refreshed, Excel finds any new rows within the source range.

To refresh

Click the Refresh data button  on the **PivotTable** toolbar.

If Microsoft Excel finds a new column (Field) in the source data it will show this on the **Pivot Table Field List** and you can then drag this to a row, column, Report filter or data area as required.

Remember that Excel can refresh the table automatically on opening. Click the **Pivot table** button on the Pivot table toolbar, select **Table Options** and put a tick in the **Refresh on open** option.

Keeping formatting when refreshing

If you have changed the formatting of the cells (e.g. you make the text bold, italic etc) you may lose the text formatting when the table is refreshed.

In this case:

Click in the table

On the **PivotTable Tools: Options** ribbon click  **Options** (in the PivotTable group)

Make sure there is a tick for **Preserve cell formatting on update**

Notes

- Column width changes will be lost unless you have also removed the **Autofit column widths on update** option
- Any cell borders you set up will also be lost when you refresh the Pivot table
- You cannot use conditional formatting within Pivot tables
- If you refresh a Pivot table which is the basis for another one **both** will change

Lesson 13: Compact, Outline and Table views

You can quickly change the layout of the PivotTable by using one of the preset views

On the **PivotTable Tools: Design** ribbon click **Report Layout** (in the **Layout** group) Select one of the views (described below)

Compact

This minimises the width of the table, shrinking columns widths to the narrowest possible and removes the gridlines

If there are more than one row heading then the headings are overlapped as shown right.

The amount they are overlapped is controlled in the **Options** (on the **PivotTable Tools: Options** ribbon) on the **Layout Format** tab and the **When in compact form indent row labels** setting (by default it is 1 character)

☐ Calabar	Swahili
☐ China	Cantonese Mandarin

Outline

This removes the gridlines, leaves column widths as they were but expands the row labels where there are more than one row heading so that lower levels do not share a line with higher levels, as shown right

☐ Calabar	Swahili
☐ China	Cantonese Mandarin

Tabular

This is the standard view with gridlines, and multi-level row headings as shown right

☐ Calabar	Swahili
☐ China	Cantonese Mandarin

Lesson 14: Using simple Functions

If you place a *text* field in the data area the Pivot table will automatically *count* the items. If you place a *numerical* field in the data area the data will be added up (summed).

Using the data shown right, for example, we may want to know the *average* number of Mangos eaten each day by each person.

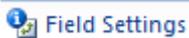
Producing a Pivot table in the usual way will show the *total number* of Mangos eaten by each person each day.

Mangos eaten		
Name	Date	Number
Donald Duck	1-Dec	1
Roger Rabbit	1-Dec	1
Pooh Bear	2-Dec	3
Roger Rabbit	1-Dec	0.5
Goofy	1-Dec	2.5
Pooh Bear	2-Dec	1
Donald Duck	1-Dec	5
Roger Rabbit	2-Dec	3
Donald Duck	2-Dec	1
Pooh Bear	1-Dec	1
Pooh Bear	1-Dec	4
Goofy	2-Dec	1
Goofy	2-Dec	1
Simba	4-Dec	1

Sum of Number	Date			Grand Total
Name	1-Dec	2-Dec	4-Dec	
Donald Duck	6	1		7
Goofy	2.5	2		4.5
Pooh Bear	5	4		9
Roger Rabbit	1.5	3		4.5
Simba			1	1
Grand Total	15	10	1	26

To change the function used
Click on the relevant field, e.g. **Sum of Number**

On the **Pivot Table Tools: Options** ribbon, click

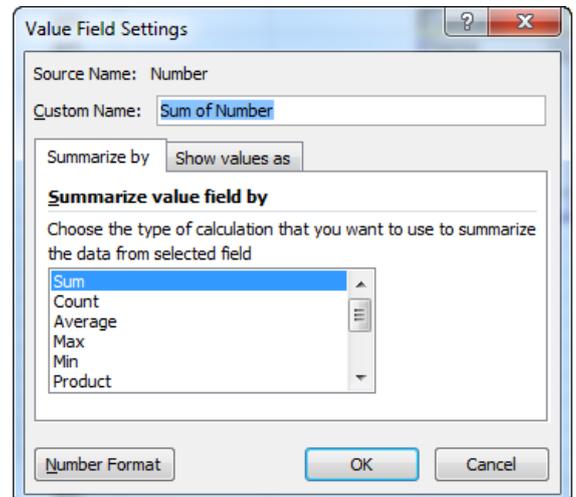


(in the **Active Field** group) and you will see the box shown right.

Click the required function and click **OK**

The field name changes, e.g. **Sum of Number** becomes **Average of Number** and the averages would be shown in the data area.

Average of Number	Date			Grand Total
Name	1-Dec	2-Dec	4-Dec	
Donald Duck	3	1		2.333
Goofy	2.5	1		1.5
Pooh Bear	2.5	2		2.25
Roger Rabbit	0.75	3		1.5
Simba			1	1
Grand Total	2.1429	1.667	1	1.857



Functions which you can use are:

Sum: Adds the numbers found in the relevant cells

Count: Counts the number of items, text and numbers which exist in the relevant cells

Average: calculates the average of the numbers in the relevant cells

Max: Finds the largest number existing in the relevant cells

Min: Finds the smallest number existing in the relevant cells

Product: Multiplies all numbers in the cells e.g. Product(2,3,4)=24

Count Numbers: Counts the number of *numbers* which exist in the relevant cells

StDev: Calculates the standard deviation of numbers in relevant cells based on a sample

StDevp: Calculates the standard deviation of numbers based on the complete population

Var: Calculates the variance of numbers in relevant cells based on a sample

Varp: Calculates the variance of numbers in relevant cells based the complete population

Lesson 15: Number format

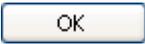
Some functions will produce results that look nasty – with many decimal places for example.

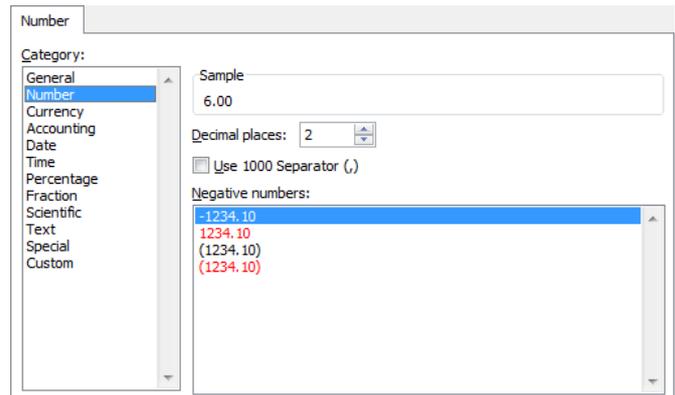
To control the way the number shows:

Right click the relevant field
Click **Number Format**

From the dialogue box click the required format.

You may then need to make further decisions, such as how many decimal places you require, whether you want a comma after the thousands unit and how you wish negative numbers shown.

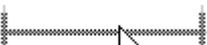
Click 



Lesson 16: Sorting Data

You may wish to organise the order of data as it appears in the columns or rows.

Sorting by Dragging

Click on the item you wish to move and release the mouse button. Move to the border of the item until the cursor changes to . Hold the mouse button down and drag until the  symbol shows in the position to which you wish to move the item. Release the mouse button.

Repeat with any items you wish to move

Note – if you are unable to move items in this way you may need to set an option.

On the **PivotTable Tools: Options** ribbon click  **Options**

Make sure there is a tick in **Classic PivotTable layout (enables dragging of fields in the grid)**

Sorting automatically

Right click the name of the field you want to sort by

Click **Sort**

Click either **Sort A to Z** or **Sort Z to A**

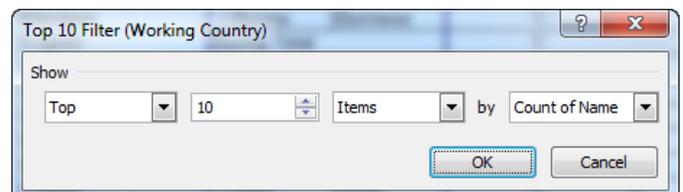
Showing the top items only

Right click the name if the relevant field

Click **Filter**

Click **Top 10**

Set how many of the items you wish to show, and whether to show top or bottom items.



Lesson 17: Calculated fields and items

Calculated fields

You can calculate new fields based on existing ones. For example, if you are dealing with Expenses you may wish to produce a forecast of the expenses for the whole year to show against the total spent so far.

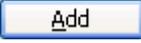
To do this, click anywhere within the Pivot Table

From the **PivotTable Tools: Options** ribbon click **Formulas** (in the Tools group) click **Calculated Field**

Click in the **Name:** box and type a name for the field

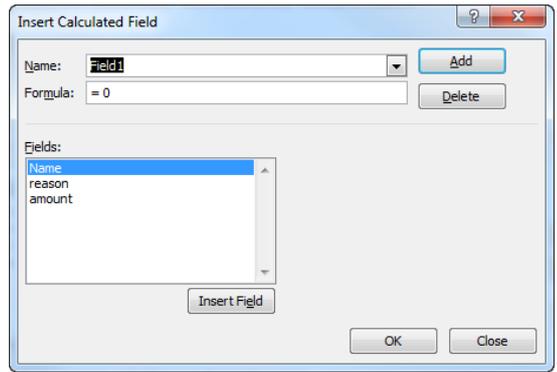
Click in **Formula** and type the formula. E.g. = amount*4

To use a field name click on the name in the box below and click **Insert field**

When you are satisfied click 

Add any more fields you require and then click 

Note: When fields are calculated the *sum* for each field is used in the calculation. E.g. the calculation $number*3$ would take the sum for each person and multiply it by 3.



Sum of Amount	Month			
Name	May	June	Grand Total	
Abigail	45	268	313	
Gao Ying	234	56	290	
Mark	56	108	164	
Mei Yu	32	32	64	
Grand Total	367	464	831	

The table on the left shows expenses for May and June. The table on the right has a calculated field multiplying the expenses by 6.

		Month		
Name	Data	May	June	Grand Total
Abigail	Sum of Amount	45	268	313
	Sum of Year Forecast	270	1608	1878
Gao Ying	Sum of Amount	234	56	290
	Sum of Year Forecast	1404	336	1740
Mark	Sum of Amount	56	108	164
	Sum of Year Forecast	336	648	984
Mei Yu	Sum of Amount	32	32	64
	Sum of Year Forecast	192	192	384
Total Sum of Amount		367	464	831
Total Sum of Year Forecast		2202	2784	4986

Calculated items

You can also create new base items. (Items exist within fields) Suppose you wish to include Public Holidays in the leave total. Let's say that there are 2 holidays in June.

Click an item heading within the row or column that that you want to add an item to

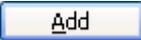
From the **PivotTable Tools: Options** ribbon click **Formulas** (in the Tools group) click **Calculated Item**

Click in the **Name:** box, type a name for the field

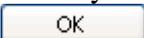
Click in **formula** and type the formula. E.g. = amount*4

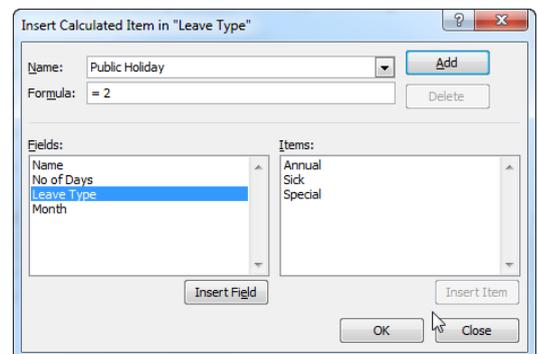
To use a field name in the formula click on the name in the box below and click  (or double click)

To use an item name in the formula click on the name of the field with which you are concerned and then click on the item name and click 

When you are satisfied click 

Add any more calculated items you require and then click





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Sum of No of days	Leave Type			
Name	Annual	Sick	Special	Grand Total
Abigail	6	3		9
Gao Ying	9			9
Mark	7	4	4	15
Mei Yu	5			5
Grand Total	27	7	4	38

The table on the left is using the original source data. The table on the right has an additional calculated item – **Public Holidays**

Sum of No of days	Leave Type					
Name	Annual	Sick	Special	Public Holidays	Grand Total	
Abigail	6	3		2	11	
Gao Ying	9			2	11	
Mark	7	4	4	2	17	
Mei Yu	5			2	7	
Grand Total	27	7	4	8	46	

Notes

- Formulae for calculated items operate on the individual records. E.g. June +2 adds two to each leave occurrence and then sums them
- You can't use calculated items where the Pivot table uses Average, StDev, StDevP, Var or VarP
- You can't use calculated items in a Pivot Table which is based on another Pivot Table

Lesson 18: Changing and Deleting calculated fields/ items

Changing Fields

From the **PivotTable Tools: Options** ribbon click **Formulas** (in the Tools group) click **Calculated Field...**

In the **Name:** box click on the down arrow and select the field you wish to change

The formula appears in the **Formula** box. Edit the formula

Click and then (Confirm overwriting if necessary)

Deleting Fields

From the **PivotTable Tools: Options** ribbon click **Formulas** (in the Tools group) click **Calculated Field...**

Select **Formulas, Calculated Field**

In the **Name** box click on the down arrow and select the field you wish to delete

Click

Changing Items

Click any item name in the row or column you are concerned with

From the **PivotTable Tools: Options** ribbon click **Formulas** (in the Tools group) click **Calculated Item**

Select **Formulas, Calculated Item**

In the **Name** box click on the down arrow and select the field you wish to change

The formula appears in the **Formula** box. Edit the formula

Click and then

Deleting Items

Click any item name in the row or column you are concerned with

From the **PivotTable Tools: Options** ribbon click **Formulas** (in the Tools group) click **Calculated Item**

Select **Formulas, Calculated Item**

In the **Name** box click on the down arrow and select the field you wish to delete

Click

Lesson 19: Relating data

You may want to see the item totals as percentages of the Grand total.

Click on the relevant field button, e.g. **Sum of Number**, (It must be a Data Item, not a heading)

From the **PivotTable Tools: Options** ribbon click **Field Settings** (in the Active Field group)

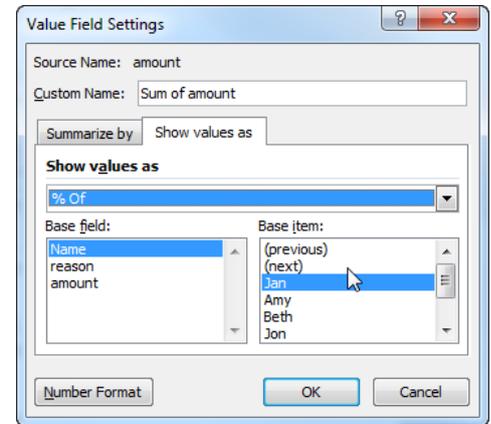
Click the **Show values as** tab

In the **Show values as** field select one of the options as explained below

Difference From: shows the difference between each number and a **Base Field** and **Base item** chosen by you. The base field must be different from the original one.

% of: shows each number as a percentage of a **Base field** and **Base item** chosen by you. The base field must be different from the original one.

% Difference from: Each number shown is the difference between the original data and a **Base field** and **base item** chosen by you. The base field must be different from the original one.



Running total in shows the numbers as running totals according to the field you define. The field will either be a row or column heading. And the running total will therefore either go across or down the table.

% of Row shows each number as a percentage of the row total

% of column which shows each number as a percentage of the column total

% of total which shows each number as a percentage of the overall total

Index: Shows the data according to the following formula:

$$(ValueInCell \times TotalOfAllData) \div (RowTotal \times ColumnTotal)$$

In this example all the data is shown as a %age of the **7 Dec** column. Notice that there are no Grand Totals.

Sum of Number	Date	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Grand Total
Name									
Donald Duck		500%	200%	0%	0%	150%	50%	100%	
Goofy		75%	33%	0%	0%	0%	29%	100%	
Mickey Mouse		0%	0%	150%	200%	150%	0%	100%	
Pooh Bear		183%	67%	0%	0%	42%	83%	100%	
Roger Rabbit		143%	286%	114%	0%	0%	357%	100%	
Simba		400%	0%	0%	200%	200%	200%	100%	
Grand Total		173.91%	86.96%	20.29%	17.39%	46.38%	86.96%	100.00%	

Lesson 20: Hiding Report Filter items

This option is not available in Excel 2007

Lesson 21: Subtotals

You can choose which subtotals show for your data and what function is used where your table has more than one row heading and/or more than one column heading.

For example, the table shown right gives the *sum* of amounts for each Department.

It may be that you wish to know how many claims have been made (*count*) or what the maximum claim was (*Max*).

You may even wish to see both these items displayed.

This is best applied to the *outer* column headings, i.e. **Department**

Sum of amount		Category		
Department	Name	Accommodation	Stationery	Subsistance
Finance	Amy	84	16	87
	Stan		57	
Finance Total		84	73	87
HR	Jan	171	16	97
	Beth	45		
	Matt	434		
HR Total		650	16	97
IT	Jon	59		65
	Tom			92
IT Total		59		157
Grand Total		793	89	341

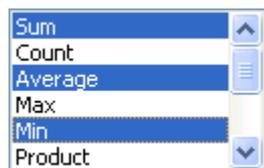
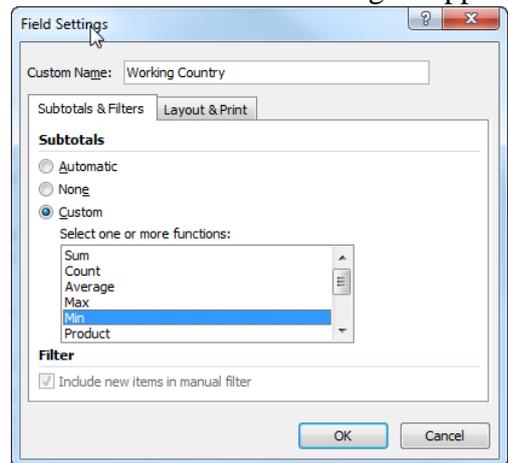
Adding subtotals

First click on the name of the field which you want to subtotal. It should be an outer row heading or upper column heading – not a Report Filter field!

From the **PivotTable Tools: Options** ribbon click **Field Settings** (in the Active Field group)

(you can also just **double click** the field name)

Click on the function you wish to use. To display more than one type of subtotal for the field click on each function for which you want a subtotal. Each one you click on will be shown in blue.



To remove a function, click on it again to remove the blue highlight

Excel adds one subtotal line for each function you select.

(The functions are outlined in Lesson 13:)

Note You can specify the summary function to use for subtotals only if the field you are subtotalling does not contain a calculated item.

Automatic: means that the standard subtotal will be calculated

Custom: select specific subtotals

None: click to remove all subtotals

Removing subtotals

Double click the relevant field name

To remove *all* subtotals for that field click on *None*

To remove specific functions click on each function you do not want so that it is not outlined in blue.

Resetting subtotals

To go back to the default setting for the subtotals (i.e. a simple total)

Double click the relevant field name

Click *Automatic*

Sum of amount		Category		
Department	Name	Accommodation	Stationery	
Finance	Amy	84	16	
	Stan		57	
Finance Sum		84	73	
Finance Average		42	24.333333	
Finance Min		23	16	

Changing where subtotals show

From the **PivotTable Tools: Design** ribbon click **Subtotals** (in the **Layout** group)

Do not show subtotals This removes subtotals from all fields in all views

Show all subtotals at Top/Bottom of group these options only apply in the Compact or Outline views.

Lesson 22: Printing a Pivot Table

The Pivot table is printed in the usual way using **File, Print** or the  button, however there are some things you will need to consider setting up before you are ready to print the Pivot Table Report.

Excel uses your PivotTable print settings whenever you print any part of a PivotTable report. The standard print settings also affect how the PivotTable report looks on the printed page.

Printing the PivotTable

If your cursor is within a PivotTable when you print, only that PivotTable will be printed

Click the **Globe** at the top left, and click **Print**

Repeating row and column headings on each page

When you print a large pivot table which goes across several pages you will find some pages have meaningless data with no row and/or column headings. You can tell Excel to repeat the row and column headings where necessary.

Before following these instructions you **must** remove all Print titles already set (on the **Page Layout** ribbon, go to **Print Titles** and remove anything in the **Rows to repeat at top** and **columns to repeat at left** options)

From the **PivotTable Tools: Options** ribbon click **Options** (in the PivotTable group)

Click the **Printing** tab

Click to add a tick to **Set print Titles**

When you print now the headings will be repeated

Notes

1. This option has no effect if:
 - the pivot table is in the Compact Form layout
 - the pivot table is in the Table Form view and the option **Merge and center cells with labels** is on
2. If you clear the **Print Title** settings on the **Page Layout** ribbon **after** you select **Set Print Titles** then you must turn the **Set Print Titles** off and on again for it to take action
3. Only **one** PivotTable per worksheet can have **Set Print Titles** on at any time

Repeating item labels as relevant on new page

This applies where there is more than one level of heading and the lower headings are broken across a page break

i.e. in the example shown right the heading **05/09/2002** applies to all the headings Stationery, Travel & Subsistence and Software.

Where these are all on one page it will appear as shown right. If the headings are divided onto different pages we need to have the upper heading **05/09/2002** repeated on the second page.

05/09/2002		
Software	Stationery	Travel & subsistence

05/09/2002
Software

Thus the last column on the first page will be as shown left, and the beginning of the second page will be as shown right – **05/09/2002** being repeated on the second page for clarity.

05/09/2002
Stationery
Travel & subsistence

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To ensure that this will happen:

From the **PivotTable Tools: Options** ribbon click **Options** (in the **PivotTable** group)

Click the **Printing** tab

Click to add a tick to **Repeat row labels on each printed page**

Adding a blank line after each item group

From the **PivotTable Tools: Design** ribbon click **Blank Rows** (in the **Layout** group)

Click **Insert Blank Line after Each Item**

Print each item group of a PivotTable report on a separate page

You can set the Pivot table so that it has page breaks after each item in a main *row* heading at any level but the right most row heading.

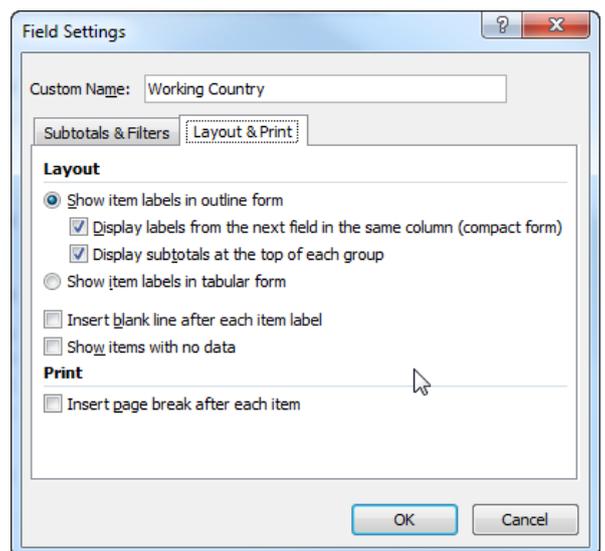
Right-click the field that has the items you want to print on separate pages and select **Field Settings**

Click the **Layout and Print** tab.

Click to insert a tick in **Insert page break after each item**

Note: Excel inserts the page breaks after the last row for each item, or after the total row for the item if you're displaying totals at the bottom for the field. If you select the check box to insert a blank row after each item group, Excel inserts the page breaks after the blank rows.

You can, of course, use manual page breaks as necessary



Lesson 23: Creating a “consolidating” pivot table report (using multiple ranges)

When you consolidate data from multiple lists or worksheets, the lists or worksheets must have matching row and column names for items that you want to summarize together. Do not include any total rows or total columns from the source data when you create the PivotTable or PivotChart report.

Examples of two spreadsheets you may wish to summarise are shown below. Notice that one is stationery orders placed in January, and the other is stationery orders placed in February.

	A	B
1	Item	Quantity
2	Black biro	34
3	Blue Biro	29
4	Pencil	1
5	Diary - week view	6
6	Diary - page view	3
7	Calendar	1
8	Paper	6
9	Sharpener	3
10	Ruler	4
11	Stapler	1
12	Staples	2
13	Notebook	2
14	Post-IT Notes	34

Note that the two sets of data do not necessarily have to be on different sheets, they can be on the same sheet, or in different files (workbooks).

	A	B
1	Item	Quantity
2	Black biro	25
3	Diary - week view	6
4	Diary - page view	3
5	Calendar	1
6	Paper	6
7	Stapler	45
8	Notebook	2
9		
10		
11		
12		
13		
14		

Consolidating data using pivot tables

Press **Alt D P** (That is, hold the Alt key down and then press first D and then P)

At Step 1 of the Wizard click to add a black dot beside **Multiple consolidation ranges** and make sure **PivotTable** has a dot beside it too.

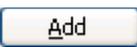
Click 

From Step 2a of the Wizard select **I will create the page fields**

Click 

On step 2b click in the **Range** box

Click on a corner cell of the data range on the spreadsheet and drag to the opposite corner so that the whole range is outlined with a moving dotted line.

Click the  button and the range will be copied to the **All Ranges** area.

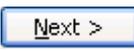
(Use the  button to find a range from another file (workbook).

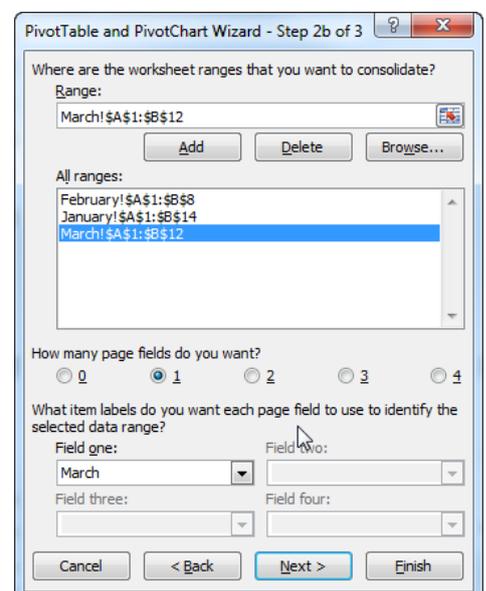
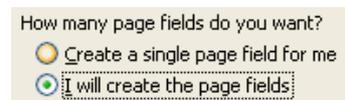
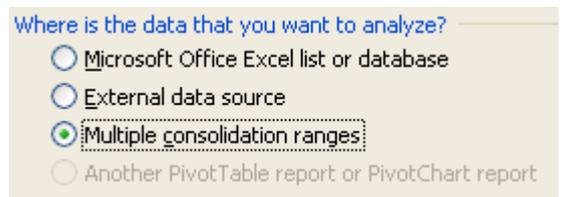
Repeat for any other ranges you require.

Once all the ranges are added:

In **How many page fields do you want** click the **1** option

Click each range and enter a name for the it in **Field one**

When all the ranges are listed and named click 

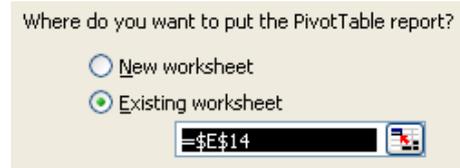


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From Step 3 select where you wish to place the PivotTable. (click the top left cell of the position on the worksheet)

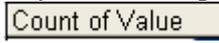
If you select **New worksheet** Excel will create a new worksheet

If you select **Existing Worksheet** Excel will automatically assume that the top left of the PivotTable will be where your cursor is currently. Click on the required sheet and cell if necessary.



Click 

You now have a PivotTable which has summarised the data from all ranges. It can be altered in the usual way. For example if the formula used is **Count** and you wish to use **Sum** double click on

, select **Sum** and click **OK**

You can also use the **Page 1** option to see the data from each range. If we had allowed Excel to create a *single page field* for us they would be called simply **Item 1**, **Item 2** etc.

Note: You could choose to have **0** page fields if you simply want a table that summarises the data, and you do not wish to be able to see each set of data separately within the table.

Lesson 24: Using Autoformats

When a Pivot table is created it has a set format. The format can be changed manually, or you can choose from a series of 22 autoformats already created.

From the **PivotTable Tools: Design** ribbon click **PivotTable Styles** and click on the one you wish to use

Note the  symbol at the right which opens the full list (thought this still has a scroll bar)

You can create a **New Pivot Table Style** from the bottom of this list.

The standard style is at the top left of the list

You can change the default style used for new PivotTables by right clicking on the Style you wish to use and clicking **Set As Default**

Note These formats will be retained when the table is refreshed

Lesson 25: Creating and printing a pivot chart

Creating a PivotChart

You can summarise the data and produce it Chart form.

If you are creating a PivotChart based on the original list of data Excel will also create a PivotTable.

From the **Insert** ribbon click the arrow below **PivotTable**

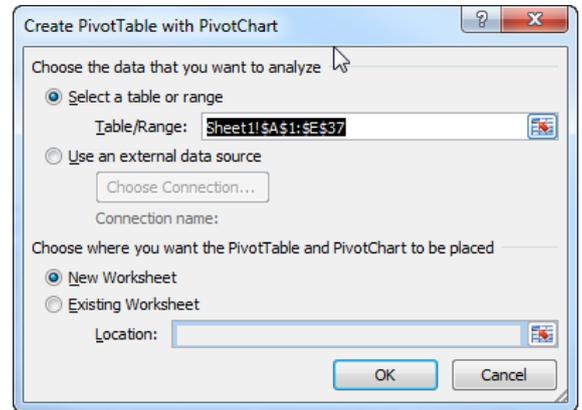
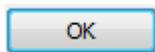


Click **PivotChart**

Select the relevant range (Note that if your cursor was in the data range it may have been completed automatically for you)

Define where you wish to place the **PivotTable and Pivot Chart** (Charts are always based on a table). The PivotChart and Table will automatically be placed on a new sheet.

Click



You will then see a new PivotTable and the basis for the chart.

You will also see the **PivotTable Field List** on the right of the screen as before

Drag each field name from the top of the field list to the relevant part of the chart shown at the bottom of the **Field List**

Report Filters are items you would like a different chart for (e.g. drag **name** there to see a chart for each person as you select each name).

Legend Fields are those for which you want to see bars in a different colours

Axis Fields are fields whose items you wish to see along the horizontal axis.

The **Values** are those for which will be used to calculate the bar heights.

E.g. The following chart has:

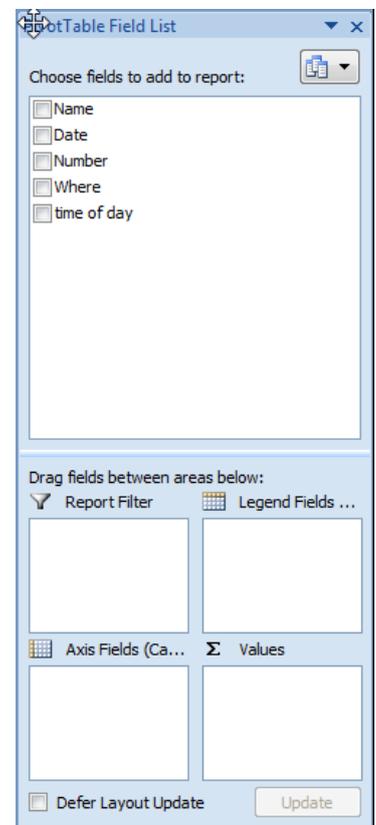
Where as a Report Filter field, so we would see different charts for **kitchen** and **Lounge**

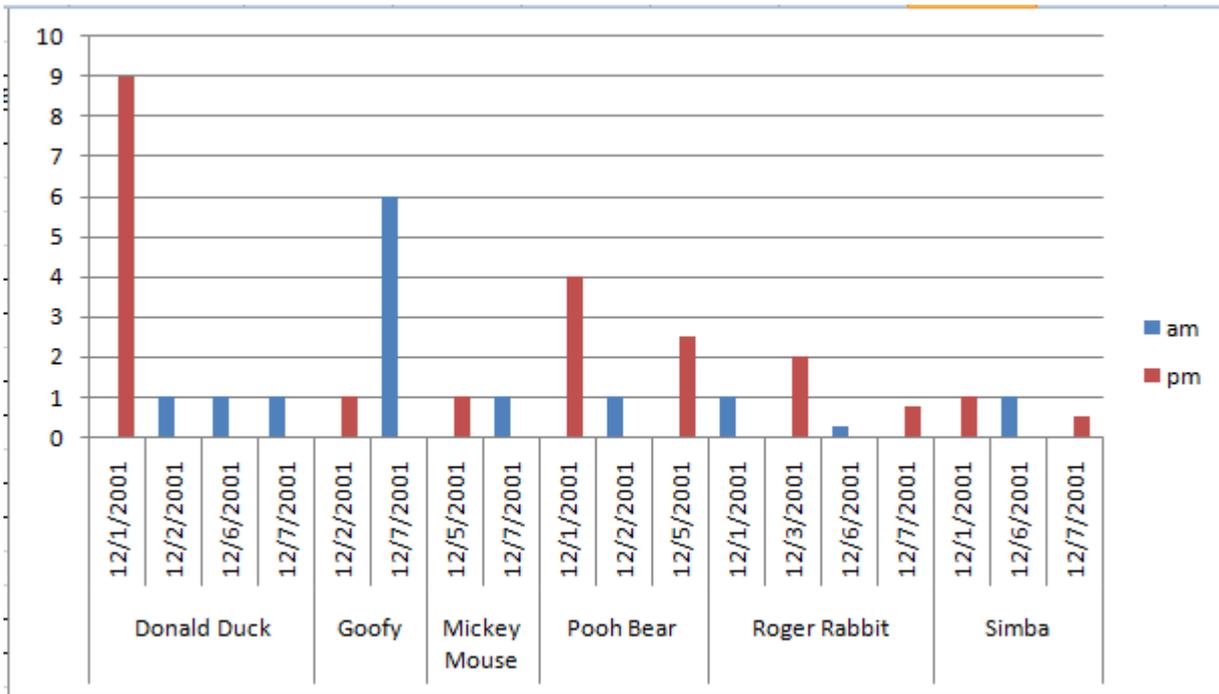
Number as a Value (if we require another function – e.g. **count** we can double click on the button to change it)

Time of day as a “Legend” field so that **am** is shown in one colour and **pm** in another.

Name and *Date* as Axis fields. Note that the order of these field buttons as shown is important. *Name* is the *leftmost* button and is therefore the *lowest* item on the horizontal axis. *Date* is on the right and is therefore the subsidiary item on the axis.

You could change *Sum of number* to show *Number eaten* by double clicking on the button and changing the name.





PivotChart ribbons

Under the heading **PivotChart Tools** you now have four new ribbons **Design**, **Layout Format** and **Analyse**

Filtering a Chart

Note that you have a **PivotChart Filter Pane** shown.

Use the fields on this to change your view of the chart.

For example,

1. select an item under **Report Filter** to see a chart based on data for that item only
2. Choose specific items under the **Axis Fields** to show
3. Choose to show only one column under **Legend Fields**

Help! I closed my Filter Pane or my PivotTable Field List

Don't panic!

On the **PivotChart Tools: Analyze** ribbon, click **PivotChart Filter** or **Field List**

Printing a Pivot chart

Print in the usual way. Make sure the PivotChart sheet is current and select **File, Print**. The Chart you see on screen will be printed.

