Excel Advanced

Contents

Formulas	3
VLOOKUP	3
COUNTIFS	4
COUNT	4
IF	5
COUNTIF	5
COUNTIFS	6
Filters	7
Ribbon Tour	7
Quick Filtering	7
Filtering by Multiple Criteria	9
Saving the Filtered Data	11
Performing Calculations on Filtered Data	12
PivotTables	13
Defined	13
Basic PivotTable Data	14
Inserting a Pivot Table	14
PivotTable Geography	15
Building a PivotTable Report – Part One	16
Adding row labels, adding column data, changing formulas in columns, changing headers formats	
Building a PivotTable Report – Part Two	24
Adding multiple row labels, collapsing and expanding, drill down to data, sorting, & refres	hing24
Building a PivotTable Report – Part Three	26
Grouping by dates, grouping by ranges, show items with no detail, show values in empty or grouping across columns	
Building a PivotTable Report – Part Four	
User defined groups, adding/removing subtotals	
Building a PivotTable Report – Part Five	
Using formulas on pivoted data	

Building a PivotTable Report – Part Six	.37
Displaying multiple row labels in columns, or tabular form	.37
Other Cool Things to do with a Pivot Table – Part Seven	. 39
Report Filters	.39
Report Slicers	.40
Expanding Filter Results to Individual Tabs	.41
Formatting as a Table - Part Eight	.41

Formulas

VLOOKUP

The VLOOKUP function searches vertically (top to bottom) the leftmost column of a table until a value that matches or exceeds the one you are looking up is found.

The elements being looked up must be unique and must be arranged or sorted in ascending order; that is, alphabetical order for text entries, and lowest-to-highest order for numeric entries.

The syntax is =VLOOKUP(lookup_value,table_array,col_index_num,[range_lookup]).

An example of the formula is: VLOOKUP(E2,D2:M3,2,TRUE) The English translation is using the value found in the cell E2, look in the range of D2 to M3 row by row. If you find a value that matches or exceeds the value in E2, using that row, go over 2 columns to the right, grab the value there and bring it back.

There are two range_lookup argument options; TRUE or FALSE

TRUE
Is the default answer, so you may leave it out of the formula
Looks for an approximate match
If it finds an exact match it will use it.
If it doesn't find an exact match, it will use the last item before it got greater
Alphabetical: Looking for Cat. If elements are Apple, Bird, Carpet, Dog; then Carpet
would be returned because Dog exceeds Cat alphabetically.
Numeric: Looking for 5.25. If elements are 3.0, 4.0, 5.0, 6.0, 7.0, then 5.0 would be used.
The last number before 5.25 was exceeded.
FALSE
Looks for an exact match.
If it finds an exact match it will use it.
If it doesn't find an exact match, it will return #N/A
Alphabetical: Looking for Cat. If elements are Apple, Bird, Carpet, Dog; then #N/A would
be returned.
Numeric: Looking for 5.25. If elements are 3.0, 4.0, 5.0, 6.0, 7.0, then #N/A would be
returned because there is no exact match.

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-				ZACHARY D. BAKER		AUG11 MLGE ZB-JA	09/19/2011	20.42	300250
				ROBERT K. GOOD		AUG11 MLGE BG-JA	09/19/2011	3.33	300198
-				SHANNON I. HETZEL	EX12-08782	AUG11 MLGE SH-JA	09/19/2011	13.99	300024
-				KENDELL L. KILBORN	EX12-08780	AUG11 MLGE KK-JA	09/19/2011	51.62	300085
				JAMES W. ALSPACH	EX12-11734	SEP11 MLGE JA-DO	10/17/2011	13.43	300121
-			9010530224	ZACHARY D. BAKER	EX12-11728	SEP11 MLGE ZB-JA	10/17/2011	42.85	300250
-			9010530261	SHANNON I. HETZEL	EX12-11687	SEP11 MLGE SH-JA	10/17/2011	14.76	300024
			9010530267	KENDELL L. KILBORN	EX12-11680	SEP11 MLGE KK-JA	10/17/2011	8.88	300085
11	0000	5200	9010530682	ROBERT K. GOOD	EX12-11825	SEP11 MLGE BG-JA	10/19/2011	42.46	300198
12									
13 14				=VLOOKUP(H	4.\$A\$16:	\$B\$22,2,FALSE)		222.90	
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	JAMES W. ALSPACH	300121			2				
	KENDELL L. KILBORN	300085		English Translation					
_	ROBERT K. GOOD	300198		English fransiauoli					
_	SHANNON I. HETZEL	300198		 Use the value found 	t in this coll				
	ZACHARY D. BAKER	300024		\smile		nge until you find it (warthy or com	othing are	astar
_	ZACHAKT D. DAKEK	300230	(
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25	TRUE	Looks for	r an approxim	ate value within the col	umn, but not l	arger, and uses that			
26						, , , , , , , , , , , , , , , , , , ,			
27	FALSE	Looks for	r an exact mat	tch and uses that row to	access the de	sired information.			
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COUNTIFS

Recall quickly the COUNT and IF commands.

COUNT

The COUNT function counts the number of cells that contain numbers and counts numbers within the list of arguments.

The syntax is COUNT(value1, value2, ...)

Continuing on with our SUM formula from above, let's not only add up the values of the range A1:A4, but let's count how many numbers are included within the range, i.e. how many cells within the range has a value in it.

The formula is =COUNT(A1:A4). The English translation is count how many cells within the range has a value in it and display the result.

-	A1:A4)	=COUNT(/	● f _x	- (A7	
ľ	E	D	С	В	A	٩
					5.00000	1
S					10.20000	2
l re					3.24978	3
						4
tł					18.45000	5
						6
					3	7
F_=						8

Notice that the range is exactly the same as our SUM, A1:A4, which includes four rows. The value returned in cell A7 is three, because only three of the four rows have values in them. If you are trying to count text, use the COUNTA formula which counts the non-blank cells.

IF

The formula makes a statement/question, if the answer is true then one response is obtained. If the answer if false, then another answer is obtained.

The syntax is =IF(logical_test,value_if_true,value_if_false)

Continuing on with our SUM formula from above, let's add some verbage to emphasize whether the result is greater or less than twenty.

The formula is =if(A5<20,"Amount is less than twenty","Amount is more than twenty"). The English translation is if the value found in A5 is less than twenty THEN display the comment 'Amount is less than twenty' ELSE display the comment 'Amount is more than twenty'.

	C5	- (f _x	=IF(A5<2	0,"Amount i	s less than t	wenty","Am	ount is mor	e than twen	ty") 🔒
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2	10.20000									
3	3.24978									
4										
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6										
7	3									
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COUNTIF

The COUNT function counts the number of cells in a range, that meets single criteria.

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	210	•	G	Jx -00		.A10, -201	5 ,65.610,	-Oranges	1	
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1		_								
2	Year	Product	Cost							
3	2013	Oranges	12.25							
4	2012	Bananas	10.50		8	=COUN	TA(B3	B10)		=
5	2012	Apples	5.10							
6	2013	Bananas	8.35		3	=COUN	NTIF(B3	:B10,"C	Dranges")
7	2013	Oranges	13.45							
8	2011	Apples	7.95							
9	2013	Pears	6.00							
10	2009	Oranges	4.55							
11										

COUNTIFS

The COUNT function counts the number of cells in a range that meets multiple criteria.

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1	Year	Product	Cost										
3	2013	Oranges	12.25										
4	2012	Bananas	10.50		8	=COUI	NTA(B3	B10)					
5	2012	Apples	5.10										
6	2013	Bananas	8.35		3	=COUI	NTIF(B3	:B10,"C	Dranges	")			
7	2013	Oranges	13.45										
8	2011	Apples	7.95		2	=COUI	NTIFS(A	3:A10,'	'=2013'	',B3:B1(0,"=Ora	nges")	
9	2013	Pears	6.00										
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Filters

Ribbon Tour



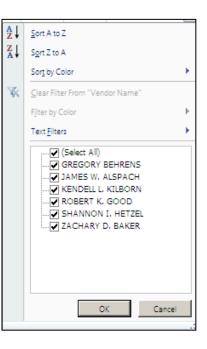
Quick Filtering

The secret to filtering is not to have a space between your titles and your data. In fact, Excel is so smart, that you do not even have your data selected, but may if you prefer.

Select your data and left click on the filter icon in the Sort & Filter Group.	Image: Source Science S
Notice that a chevron appears to	A B C D E
the left of each header.	1 Vendor Name V JE# V Transaction Descrip V Effective V Actu V
	2 ROBERT K. GOOD EX12-05441 JUL11 MLGE BG-JA 08/17/2011 11.18
	3 KENDELL L. KILBORN EX12-08780 AUG11 MLGE KK-JA 09/19/2011 51.62
	4 SHANNON I. HETZEL EX12-08782 AUG11 MLGE SH-JA 09/19/2011 13.99
	5 ROBERT K. GOOD EX12-08791 AUG11 MLGE BG-JA 09/19/2011 3.33
	8 ZACHARY D. BAKER EX12-08818 AUG11 MLGE ZB-JA 09/19/2011 20.42
	7 KENDELL L. KILBORN EX12-11680 SEP11 MLGE KK-JA 10/17/2011 8.88
	8 SHANNON I. HETZEL EX12-11687 SEP11 MLGE SH-JA 10/17/2011 14.76
	9 ZACHARY D. BAKER EX12-11728 SEP11 MLGE ZB-JA 10/17/2011 42.85
	10 JAMES W. ALSPACH EX12-11734 SEP11 MLGE JA-DO 10/17/2011 13.43
	11 ROBERT K. GOOD EX12-11825 SEP11 MLGE BG-JA 10/19/2011 42.48
	12 ROBERT K. GOOD EX12-14134 OCT11 MLGE RG-JA 11/16/2011 3.89
	13 GREGORY BEHRENS EX12-14155 OCT11 MLGE GB-JA 11/16/2011 21.09
	14 GREGORY BEHRENS EX12-17898 NOV11 MLGE GB-JA 12/15/2011 7.22
	15 ZACHARY D. BAKER EX12-17900 NOV11 MLGE ZB-DO 12/15/2011 32.08
	18 KENDELL L. KILBORN EX12-20000 DEC11 MLGE KK-JA 01/18/2012 27.75
	17 ROBERT K. GOOD EX12-20010 DEC11 MLGE RG-JA 01/18/2012 3.89
	18 ZACHARY D. BAKER EX12-20033 DEC11 MLGE ZA-JA 01/18/2012 29.03
	19
	Average: 20435.14265 Count: 90 Sum: 694794.85 🔠 🛄 🛄 90% ,

By selecting the chevron to the left of Vendor Name, a dialog box appears displaying all unique text filters found in the range as well as other common sort icons.

If you only want a particular filter, deselect the (Select All) box and check the filter you desire.



In the below screen shot, Kendell Kilborn is selected. Notice the hidden rows to the left. Those represent data lines for mileage paid to individuals other than Kendell. No data is lost, it is just currently hidden.

Also note that the icon to the left of the vendor name now displays the filter icon. This so at a glance the user may see that the data range has been filtered.

	A	В
1	Vendor Name 🕅	JE# 💌
5	KENDELL L. KILBORN	EX12-08780
6	KENDELL L. KILBORN	EX12-11680
7	KENDELL L. KILBORN	EX12-20000

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8	KENDELL L. KILBORN	EX12-11680	SEP11 MLGE K	K-JA 1
7	KENDELL L. KILBORN	EX12-20000	DEC11 MLGE K	K-JA 0
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Filtering by Multiple Criteria

The filtering tool is fine when you only want one item. However the power of the advance filter tool really shines when you want to sort by multiple criteria. There are several thou shalts of advanced filtering.

Thou Shalts of Advanced Filtering								
	1	The headers in the criteria range must be exactly as they are in the list range						
	2	There must be at least one blank row between the criteria range and the list range						

	Steps For Advanced Filtering
\bigcirc	Create a criteria range by inserting a few rows and copying the header from the data range.
	Although not required, it is often best to have the range above your data for simplicity.
2	Type in the criteria you want to filter by.
3	Have your curser somewhere in the data range
4	Select the Advanced icon with your left mouse button.
5	The list range most likely will be your data. If not, you will need to correct it.
6	Select your criteria range.
\mathbf{O}	The range must include the headers of the criteria range
	The rows with criteria
	All columns in the range
7	Select OK

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1	Vendor Name	JE#	Transaction Description	Effective	Actual		
2	KENDELL L. KILBORN				>10	– (1)	(2)
4	Vendor Name	JE#	Transaction Description	Effective	Actual	\sim	
5	GREGORY BEHRENS		OCT11 MLGE GB-JA	11/16/2011	21.09		
6	GREGORY BEHRENS	EX12-17896	NOV11 MLGE GB-JA	12/15/2011	7.22		
7	JAMES W. ALSPACH	EX12-11734	SEP11 MLGE JA-DO	10/17/2011	13.43		
8	KENDELL L. KILBORN	EX12-08780	AUG11 MLGE KK-JA	09/19/2011	51.62		
9	KENDELL L. KILBORN	EX12-11680	SEP11 MLGE KK-JA	10/17/2011	8.88		
10	KENDELL L. KILBORN	EX12-20000	DEC11 MLGE KK-JA	01/18/2012	27.75		
11	ROBERT K. GOOD	EX12-05441	JUL11 MLGE BG-JA	08/17/2011	11.16		
12	ROBERT K. GOOD	EX12-08791	AUG11 MLGE BG-JA	09/19/2011	3.33		
13	ROBERT K. GOOD	EX12-11825	SEP11 MLGE BG-JA	10/19/2011	42.46	(
14	ROBERT K. GOOD	EX12-14134	OCT11 MLGE RG-JA	11/16/2011	3.89		
15	ROBERT K. GOOD	EX12-20010	DEC11 MLGE RG-JA	01/18/2012	3.89		
16	SHANNON I. HETZEL	EX12-08782	AUG11 MLGE SH-JA	09/19/2011	13.99		
17	SHANNON I. HETZEL	EX12-11687	SEP11 MLGE SH-JA	10/17/2011	14.76		
18	ZACHARY D. BAKER	EX12-08818	AUG11 MLGE ZB-JA	09/19/2011	20.42		
19	ZACHARY D. BAKER	EX12-11728	SEP11 MLGE ZB-JA	10/17/2011	42.85		
20	ZACHARY D. BAKER	EX12-17900	NOV11 MLGE ZB-DO	12/15/2011	32.08		
21	ZACHARY D. BAKER	EX12-20033	DEC11 MLGE ZA-JA	01/18/2012	29.02		
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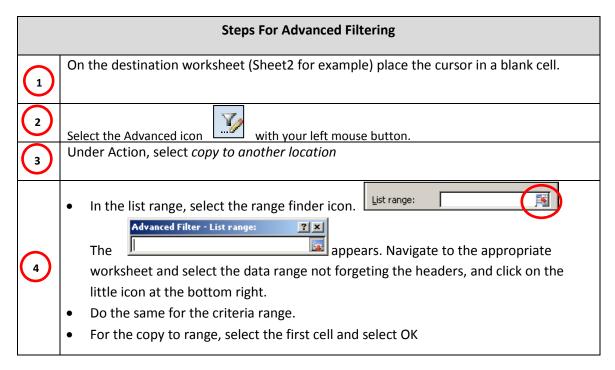
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The results appear below.

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3 4 Vendor Name	JE#	Transaction Description AUG11 MLGE KK-JA	Effective 09/19/2011									
3 4 Vendor Name	JE# EX12-08780			Actual								
3 4 Vendor Name 8 KENDELL L. KILBORN	JE# EX12-08780	AUG11 MLGE KK-JA	09/19/2011	Actual 51.62								
3 4 Vendor Name 8 KENDELL L. KILBORN 10 KENDELL L. KILBORN 22	JE# EX12-08780 EX12-20000	AUG11 MLGE KK-JA DEC11 MLGE KK-JA	09/19/2011 01/18/2012	Actual 51.82 27.75								
3 4 Vendor Name 8 KENDELL L. KILBORN 10 KENDELL L. KILBORN	JE# EX12-08780 EX12-20000	AUG11 MLGE KK-JA DEC11 MLGE KK-JA	09/19/2011	Actual 51.62			→ I +					

Saving the Filtered Data

Now that the data has been filtered it would be great to save it so you can manipulate it further. To do so is a rather straight forward process. Basically you will go to where you want to save it, Sheet2 in our example, and go through the filtering process that we did above with just a couple of twists.



Advanced Filter	1	? ×
Action		_
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<u>C</u> riteria range:	Filtering!Criteria	
Copy <u>t</u> o:	Sheet2!\$A\$1	I
Unique record	ls only	
	OK Cancel	

Performing Calculations on Filtered Data

Excel's traditional formulas do not work on filtered data since the function will be performed on both the hidden and visible cells. To perform functions on filtered data one must use the subtotal function.

The syntax is SUBTOTAL(function_num, range_reference1, range_reference2,....)The following functions may be performed with the subtotal. The function_num within the syntax relates to the numbered function.

Function Number	Function	Function Number	Function
1	AVERAGE	7	STDDEV
2	COUNT	8	STDDEVP
3	COUNTA	9	SUM
4	MAX	10	VAR
5	MIN	11	VARP
6	PRODUCT		

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1	Vend	or Name	T	JE#	💌 T	ransaction	Description 🕒	 Effect 	ive 💌	Actu: 💌					
3	KENDELL L.	KILBORN	EX	12-08780	AUC	611 MLGE	KK-JA	09/19	/2011	51.62					
8	KENDELL L.	KILBORN	EX	12-11680	SEF	11 MLGE I	KK-JA	10/17	/2011	8.88					
16	KENDELL L.	KILBORN	EX	12-20000	DEC	11 MLGE I	KK-JA	01/18	/2012	27.75					=
19															
20								Grand To	tal	347.85		=SUM(E2:E19		
21			T												
22						Т	otal on Filter	ed Data		88.25		=SUBTC	TAL(9,E	2:F19)	
23															-
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An example of the formula is: =SUBTOTAL(9,E12:F19) The English translation is using the ninth subtotal function, which is SUM, add up all of the data within the range that is selected by the filter. For comparison, included is the SUM function for the same range which brought back the total for all of the data cells, hidden or displayed.

PivotTables

Defined

The foundation of what is a PivotTable report is explained as follows:

As long as you can connect to the data, whether it be locally in the same workbook or remotely in other locations, you can built PivotTable reports that rearrange the raw data and change it into meaningful information

A pivot table is an interactive way to quickly summarize large amounts of data; to analyze numerical data in detail and to answer unanticipated questions. They are especially designed for:

- Querying large amounts of data in many user-friendly ways
- Subtotaling and aggregating numeric data, summarizing data by categories and subcategories, and creating custom calculations and formulas
- Expanding and collapsing levels of data to focus your results, and drilling down to details from the summary data.
- Moving rows to columns or columns to rows (or "pivoting"0 to see different summaries of the source data.
- Filtering, sorting, grouping, and conditionally formatting the most useful and interesting subset of data to enable you to focus on the information that you want.

	Thou Shalts in PivotTable Land
1	Headers should be in columns, not rows
2	No blank rows between the headers and the data
3	Best to have the pivot table on a separate worksheet so it does not accidently clobber the data
4	Best to have simple data, rows and columns of data.
5	Best to format your area as a table, especially when you will be adding data to it. The table is automatically expanded when data is added to the next row. Now when you launch create a pivot table the range will be the table name, and not the cell addresses

Basic PivotTable Data

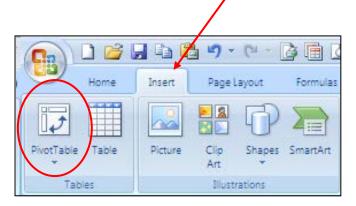
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3	300004	John	Adams	3662 Fairoaks Court	Santa Barbara	OR	90222	Business Services	1644 Magnolia	49234
4	300006	Thomas	Jefferson	22086 Wesley Drive	San Jose	CA	90333	ECS	Excel	79076
5	300008	James	Madison	17757 Flowers Lane	San Diego	OR	90444	Food Services	Sequoia	40234
6	300010	James	Monroe	1125 Gold Street	Santa Barbara	CA	90555	Graphics	Oasis	41234
7	300012	John	Adams	751 Hilltop Drive #74	San Jose	OR	90666	Human Resources	1644 Magnolia	50234
8	300014	Andrew	Jackson	422 Shell Drive	San Diego	CA	90777	Info Technology	1644 Magnolia	13234
9	300016	Martin	Van Buren	7788 Justice Mine Road	Santa Barbara	OR	90888	Inst Services	1644 Magnolia	54234
10	300018	William	Harrison	17280 North Fork	San Jose	CA	90999	Maint/OPER	Warehouse	92183
11	300020	John	Tyler	1973 Sycamore Drive	San Diego	WA	91110	Project SHARE	Alta Mesa	51234
12	300022	James	Polk	1931 Herbscenta Lane	Santa Barbara	NY	91221	SELPA	1544 Magnolia	42234
13	300024	Zachary	Taylor	7749 Music Road	San Jose	MN	91332	Special ED	43 Hilltop	19548
14	300026	Millard	Fillmore	13357 Kokanee Drive	San Diego	CA	91443	Superintendent	1644 Magnolia	52864
15	300028	Franklin	Pierce	P.O. Box 71234	Santa Barbara	WA	91554	Transportation	Transportation	27234
16	300030	James	Buchanan	17290 Flowers Lane	Seattle	NY	91665	WES Camp	NEED Camp	43234
17	300032	Abraham OKUP Filtering	Lincoln save filter / (225 Ridgetop Drive #115	Boston	MN	91776	Alternative Ed	1644 Magnolia	11234

Pivot Tables work best when you have simple data in rows and columns.

- Headers are across the top in the first row
- Data consists of a single row across numerous columns
- There is not a blank row between the headers and the rows

Inserting a Pivot Table

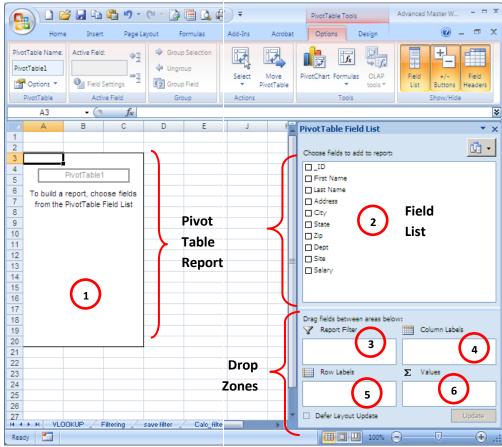
- Select any active cell within your data table
- Navigate to the *Insert tab* and select *PivotTable*



Create PivotTable	? X
Choose the data that you want to analyze	
Select a table or range	
Table/Range: pivot table data'!\$A\$1:\$J\$74	.
O Use an external data source	
Choose Connection	
Connection name:	
Choose where you want the PivotTable report to be placed	
• New Worksheet	
C Existing Worksheet	
Location:	1
ОК	Cancel

When you do so, the create PivotTable dialog box appears.

- Excel will guess the data range that you will want; correct it if it is wrong.
- The default destination for the PivotTable will be a new worksheet.
- When doing so, a new sheet will automatically be added to your workbook.
- It is good to use a new worksheet for the pivot table so that your source data doesn't accidently get clobbered.



PivotTable Geography

	PivotTable Geography
1	 The pivot table will be located here. The size will adjust as it needs to automatically. NOTE: If you move your mouse out of this area, the PivotTable Field List will disappear. To get it back, merely left click your mouse within this area again and it will appear.
2	 The fields listed here are your column headers on your original data source. These fields may be utilized in designing your PivotTable Report. You may use a field more than once.
З	Report Filters:Similar to a mentally page break. Allows the user to classify the data
4	 Column Labels: Often created automatically by dragging data fields to the value zone. The user may also drag data fields to this zone for grouping, etc.
5	Row Labels: • Most common label
6	Values:Wide range of calculations may be performed on the values dragged to this zone.

Building a PivotTable Report - Part One

Adding row labels, adding column data, changing formulas in columns, changing headers & number formats

In order to best illustrate how to design pivot tables, we will begin with the goal report, depicted below, and then step through each design component.

This table will represent by department, the number of employees per department and their average salary. We will also change a column header and the number font for the salary column.

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-	ECS	4	\$60,028				Address	
8	Food Services	5	\$40,530					
9	Graphics	5	\$46,985				□ State	
	Human Resources	5	\$54,899					
11	Info Technology	5	\$41,958				Dept	
	Inst Services	5	\$44,882				□ Site	
	Maint/OPER	5	\$41,824				Salary	
	Project SHARE	5	\$75,755					
	SELPA	5	\$56,322					
	Special ED	5	\$49,104					
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Figure 1: Building a PivotTable- Part One

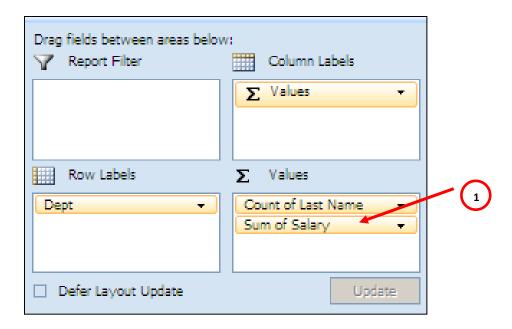
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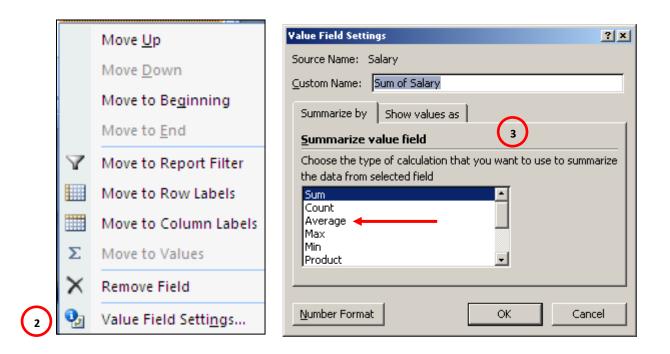
		Create Row Label
	•	Select the Dept name with your mouse, left click, and drag it to the <i>row label</i> zone.
2	•	The list our SCOE departments now appear to the left.

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9	Graphics	5	234927		□ State	
	Human Resources	5	274493		Zip	
11		5	209791		Dept	
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16	Special ED	5	245522			
17	Superintendent	5	282335			
18	Transportation	5	220599			
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	Adding a COUNT and SUM Columns											
	•	Drag down last name and salary into the Value zone										
\bigcirc	•	Last Name										
2		\circ Every employee has a last name. So if we use last name in a value field the										
		result displayed in the field will merely be the number of last names that										
		we have.										
		 Note that the formula used is count because it is a text field. 										
	•	Salary										
		 Excel automatically used the SUM formula. 										
		 The SUM formula needs to be changed to the AVERAGE formula 										

To change the formula, we will launch the value fields setting dialog box and choose a different formula.





	Changing a Formula
	Left click on the Sum of Salary field
2	The value dialog box will appear. Using a left click on your mouse, select the Value Field Settings
3	The value field settings dialog box appears. On the summarized by tab, select the average calculation from the drop down box

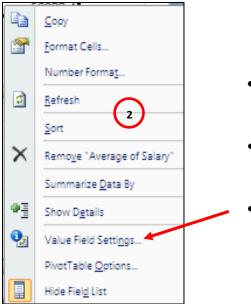
The result is represented below. 3 Notice that the header now is Average of Salary, rather than Sum of Salary.

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6	Business Services	5	34806.8			Last Name	•				
7	ECS	4	60027.5			Address					
8	Food Services	5	40530.2			City					
	Graphics	5	46985.4			State					
10	Human Resources	5	54898.6			Zip					
	Info Technology	5	41958.2			Dept					
	Inst Services	5	44881.6			Site					
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Now we want to change the column headers and the number format.

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	Changing Column Headers and Number Formats								
	Left click on the Count of Last Name column header, B4. Modify the title as you would any title								
	in a normal spreadsheet, in other words, get typing.								
(2)	Select any cell in the Average of Salary column. Right click on your mouse which launches an								
	option dialog box. Left click on value field settings option which launches the value field setting								
	dialog box.								
	In the value field settings dialog box, select the number format button on the bottom left								
	corner.								
4	Within the format cells dialog box, select your desired format								



- Place your mouse anywhere within the Average of Salary column data.
- Right click your mouse which will display the option box.
- Select the value field settings option.

	Format Cells
Value Field Settings ? × Source Name: Salary Custom Name: Sum of Salary Summarize by Show values as Summarize value field Choose the type of calculation that you want to use to summarize the data from selected field Sum •	Format Cells Category: Category: General Number Currency Accounting Date Time Percentage Fraction Scientific
Count Average Max Min Product 3 OK Cancel	Text Special Custom

Figure 2: Value Field Settings Dialog Box

We now have the final results below.

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	Graphics	5	\$46,985					□ State	
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Building a PivotTable Report - Part Two

Adding multiple row labels, collapsing and expanding, drill down to data, sorting, & refreshing

We can expand the detail provided in the pivot table if we would like. Using the table grouped by departments if the last name is dragged to the row label zone then each department will have the last name of the employees listed.

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The results can either be collapsed or expanded by either selecting the collapsed or expanded icon located on the PivotTable Tools\options tab and within the active fields group. Using the + or – icon located to the left of each row label will have the same result.

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If we want to obtain detail information on our items we can by double left clicking on any calculated field. For example, if we double click on cell B19, the number of employees in the WES Camp department, the following appears on a separate tab.

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Two very useful icons on the PivotTable Tools tab are sort and refresh.

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PivotTable	Active Field •	Group	ZA↓ Sort 1 Sort	Refresh Change D Source		Tools

	PivotTable Tools Option Tab
	Sort works exactly the same as the sort on the Data tab. However, if you want to sort the results created in the PivotTable, you must use the icon located on this tab.
2	If you update your source data, it is imperative to refresh your pivot table results, actually each pivot table created using the same source data.

Building a PivotTable Report - Part Three

Grouping by dates, grouping by ranges, show items with no detail, show values in empty cells, grouping across columns

The next illustration will focus on grouping, using both a default group as well as a self-defined group.

Pivoting on dates, we will use a default group how to design pivot tables, we will begin with the goal report, depicted below, and then step through each design component. At the conclusion of Building a PivotTable Report, all steps will be summarized.

This table will represent by dates, the number of employees per department and their average salary. We will also change a column header and the number font for the salary column.

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- Create the basic structure by dragging the start dates to the row labels zone and the last name to the values zone.
- Select any cell with the data area (row labels) and right click on your mouse.
- The dialog box at the right appears
- Notice the group & ungroup options.

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	and Total	73	

3	Row Labels 💌 Count of Last Name
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14	■ 1995
15	Qtr3 1
16	■ 1996
17	Qtr1 2
18	= 1997

1			
10	3	Row Labels 💌	Count of Last Name
7	4	Qtr1	16
7	5	Qtr2	8
9 8	6	Qtr3	24
8	7	Qtr4	25
73	8	Grand Total	73

- •
- The grouping dialog box appears as • displayed to the left.
 - Excel defaulted to Months.
 - The following screen shots show the pivot table results for when we choose:
 - o Months
 - o Quarters
 - o Years
 - o Years & Quarters

Tables can also be grouped by ranges. In our previous examples our pivot tables have broken down by department, the number of employees per department and their average salary. If we wanted to pivot our data by salary ranges we could with the end result appearing as below.

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- Drag the salary to the row labels zone and the last name to the values zone.
- Notice that no one makes less than \$20,000 so that the range 0-19999 does not appear.
- To force all ranges appear, we turn on the option to show items with no detail.
- To do so:

3

- select any cell within the row labels
- o right click your mouse
- Select Field Settings
 - Select the Layout & Print tab
- Check the Show items with no data box.

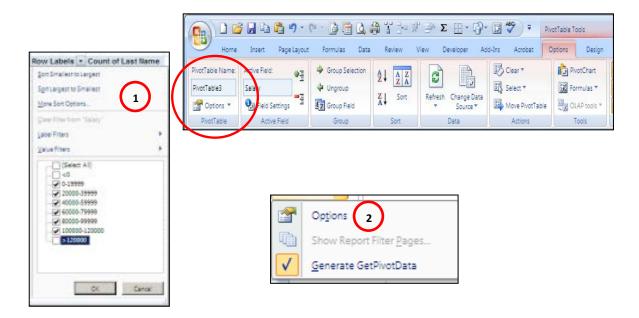
Field Settings	? ×			
Source Name: Salary				
Custom Name: Salary				
Subtotals & Filters Layout & Print 3				
Layou				
● Show item labels in outline form				
🗵 Display labels from the next field in the same column (compac	t form)			
Display subtotals at the top of each group				
C Show item labels in tabular form		3	Row Labels 💌	Count of Last Name
Insert blank line after each item label		4	<0	
🔍 🗖 Sho <u>w</u> items with no data 🛑		5	0-19999	
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Insert page break after each item		7	40000-59999	23
		8	60000-79999	11
		9	80000-999999	11
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Number Format OK C.	ancel	11	>120000	
		12	Grand Total	73

Let's clean up the data a bit by removing the <0 and >0 lines, as well as having the value zero (0) appear for ranges with no values.

- By choosing the chevron to the right of Row Labels, deselect the <0 and >120000 range.
 - To display zeros, navigate to PivotTable Tools\options tab and select Options from the PivotTable Group and select options which launches the options dialog box.

2

• Within the Layout & Format tab, insert a zero in the box for the For Empty cells show: option.



PivotTable Options	<u>? ×</u>
Name: PivotTable3	
Layout & Format Totals & Filters Display Printing Data Layout	
Display fields in report filter area: Down, Then Over 💽 Report filter fields per column: 0 🚔	
For empty cells show:	
<u>Autofit column widths on update</u> <u>Preserve cell formatting on update</u>	
OK Canc	el

So far the only grouping we have done has been by the rows. Groups can be done by columns as well. In all of our first tables, we group on the starting date by grouping, or combining, the individual dates by month.

Build a pivot table with the departments as the row labels and drop the start dates into the column labels. The table appears as follows:

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To group by the years, navigate your mouse to any date in the pivot table. Right click you mouse so that the dialog box appears, select group, and select years. Finish by selecting OK. The pivot table appears as below.

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The final grouping we will review is by group by categories that are not part of the original table. Returning to the pivot table where we are pivoting be departments, counting the number of employees by department, and calculating the average salary, you will recall it appears as below.

Building a PivotTable Report - Part Four

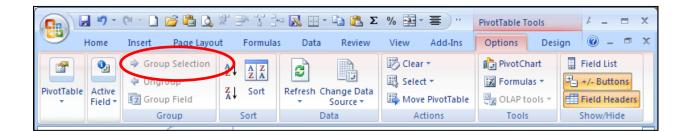
User defined groups, adding/removing subtotals

The user may define groups for data that is not included in the original source data.

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7	ECS		4 \$60,028	
8	Food Services	:	5 \$40,530	
9	Graphics		5 \$46,985	
10	Human Resources		5 \$54,899	
11	Info Technology		5 \$41,958	
12	Inst Services		5 \$44,882	
13	Maint/OPER		5 \$41,824	
14	Project SHARE		5 \$75,755	
15	SELPA		5 \$56,322	
16	Special ED		5 \$49,104	
17	Superintendent		5 \$56,467	
18	Transportation		5 \$44,120	
19	WES Camp		4 \$34,234	
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In order to group each department by its cabinet member, we will take the following steps.

- Select those departments under the first cabinet member by CTRL +left click:
 - Alternative Ed, Inst Services, Special Ed
- Choose group selection on the PivotTable Tools\Options tab and select group selection.
- Notice that Group 1 now appears at the top of the pivot table.
- Left click on the Group 1 header and type Flores.



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Continue with the group selections until it is completed by cabinet member and appears as below.

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8	Project SHARE		5	\$75,755	
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10	WES Camp		4	\$34,234	
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12	Business Services		5	\$34,807	
13	Graphics		5	\$46,985	
14	Info Technology		5	\$41,958	
15	Maint/OPER		5	\$41,824	
16	Transportation		5	\$44,120	
17	Thompson				
18	ECS		4	\$60,028	
19	Food Services		5	\$40,530	- 1
20	Armelino				- 1
21	Human Resources		5	\$54,899	
22	SELPA		5	\$56,322	
23	Superintendent		5	\$56,467	
24	Grand Total		73	\$49,084	
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The departments are grouped by cabinet members.

To add subtotals by cabinet members:

- Navigate to the PivotTable Tools\Design Tab.
- Select subtotals within the layout group.
- Select from one of the three options:
 - o Do not show subtotals
 - Show all subtotals at the bottom of the group
 - Show all subtotals at the top of the group.

Selecting the option to display the subtotals at the bottom of the group looks like this.

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6	Alternative Ed	5	\$53,567	
7	Inst Services	5	\$44,882	
8	Project SHARE	5	\$75,755	
9	Special ED	5	\$49,104	
10	WES Camp	4	\$34,234	
11	Flores Total	24	\$52,228	
12	🗏 Hillman			
13	Business Services	5	\$34,807	
14	Graphics	5	\$46,985	
15	Info Technology	5	\$41,958	
16	Maint/OPER	5	\$41,824	
17	Transportation	5	\$44,120	
18	Hillman Total	25	\$41,939	
19	Thompson			
20	ECS	4	\$60,028	
21	Food Services	5	\$40,530	
22	Thompson Total	9	\$49,196	
23	Armelino			
24	Human Resources	5	\$54,899	
25	SELPA	5	\$56,322	
26	Superintendent	5	\$56,467	
27	Armelino Total	15	\$55,896	
28	Grand Total	73	\$49,084	
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Building a PivotTable Report - Part Five

Using formulas on pivoted data

Information displayed in a pivot table may be enhanced by adding additional computations by using formulas and functions.

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	7	Business Services	5	\$40,807	
	8	Maint/OPER	5	\$43,824	
	9	Info Technology	5	\$43,958	
	10	Graphics	5	\$46,985	
	11	Inst Services	5	\$48,882	
	12	Transportation	5	\$50,120	=
	13	Human Resources	5	\$54,899	
	14	SELPA	5	\$56,322	
	15	Superintendent	5	\$56,467	
	16	Alternative Ed	5	\$59,567	
	17	ECS	4	\$60,028	
	18	Special ED	5	\$63,104	
		Project SHARE	5	\$75,755	
		Grand Total	73	\$51,824	
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Starting with our basic average salary by department pivot table, we will:

- Drag salary again down to the formulas zone
- Navigate to a cell with the column and right click the mouse to launch the dialog box
- Select *value fields settings* to launch the dialog box.

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Custom Name: Sum of Salary	6	5	\$40,530	5.36%	
	7	5	\$40,807	5.39%	
Summarize by Show values as	8	5	\$43,824	5.79%	
	9	5	\$43,958	5.81%	
Show values as	10	5	\$46,985	6.21%	
	11	5	\$48,882	6.46%	
% of total 🗸 🗸 🗸	12	5	\$50,120	6.62%	
% Difference From	13	5	\$54,899	7.26%	
Running Total in	14	5	\$56,322	7.44%	
% of row	15	5	\$56,467	7.46%	
% of column	16	5	\$59,567	7.87%	
% of total	17	4	\$60,028	6.35%	
Index 💌	18	5	\$63,104	8.34%	
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- Navigate to the Show values as tab.
- Instead of showing the values as normal, select the down arrow to display the various options.
- In this example we want to show the values as a percent of column total.

You may also make calculations on the pivot table results themselves. For instance, to calculate the percent of salaries paid by the various departments:

- Drag the salaries once again to the *formulas zone*.
- Navigate to a cell with the column and right click the mouse to launch the dialog box
- Select value fields settings to launch the dialog box. On the summarize tab, select count.
- Within the value fields settings dialog box now select the *show vales as* tab.
- Launch the dropdown box and select Percent of grand total.

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7	Business Services			40,807		39%		1		
_	Maint/OPER			43,824		79%				
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10	Graphics			46,985		21%	6.849			
11	Inst Services			48,882		46%	6.849			-
12	Transportation		-	50,120		62%	6.849	1		L
13	Human Resources			54,899		26%				
14	SELPA			56,322		44%				
15	Superintendent			56,467		46%	6.849			
	Alternative Ed			59,567		87%	6.849			
	ECS			60,028		35%	5.479			
18	Special ED			63,104		34%	6.849			
19	Project SHARE			75,755		01%	6.849			
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The resulting pivot table appears to the right.

At first glance, it may appear that the calculation is incorrect because the majority of the results in the % of Salary Paid by Department is 6.8493%.

It is correct. The reason the percent is the same for so many departments is due to the fact that so many departments have five employees.

Building a PivotTable Report - Part Six

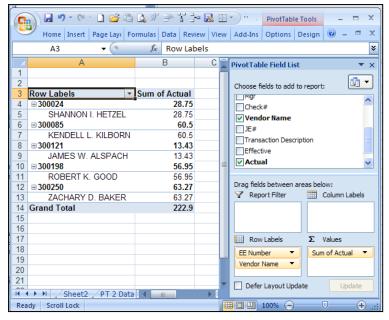
Displaying multiple row labels in columns, or tabular form.

As with any other zone, multiple data fields may be added to the row label zone. However, depending on your settings, the label plus one indents within the table.

To the right is an export from Escape of mileage paid to the IT staff. It is organized by Employee number, name, and the total of the amount paid each employee.

Notice the name is displayed on a separate line below the EE ID and indented.

So that the table is cleaner, and half the size, the names may be displayed on the same line.



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This is a much cleaner presentation of the data.

The steps performed were:

- Display the labels in tabular form, and
- eliminate the subtotals by employee

To display the labels in tabular form navigate to PivotTable Tools\design tab. Within the layout group select report layout.

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Three display options are available.

By selecting show in tabular form the ID and the employee name will appear on the same row.

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1		A	В	C
	1			
1110	2			
	3	EE Number 💽	Vendor Name 🛛 💽	Sum of Actual
Η	4	300024	SHANNON I. HETZEL	28.75
	5	300024 Total		28.75
	6	∃ 300085	KENDELL L. KILBORN	60.5
,	7	300085 Total		60.5
	8	300121	JAMES W. ALSPACH	13.43
٢	9	300121 Total		13.43
J	10	300198	ROBERT K. GOOD	56.95
]	11	300198 Total		56.95
	12	300250	ZACHARY D. BAKER	63.27
	13	300250 Total		63.27
	14	Grand Total		222.9



Although the table is better, it still is too busy due to the subtotals.

To eliminate the subtotals, we will return to the PivotTable Tools\design tab. This time within the layout group we will select subtotals, and choose the option not to show subtotals.

		-		-	-
1					
2					
3	EE Number 💽	Vendor Name	•	Sum of Actual	
4	≡ 300024	SHANNON I. HETZEL		28.75	
5	≡ 300085	KENDELL L. KILBOR	Ν	60.5	
6	300121	JAMES W. ALSPACH		13.43	
7	300198	ROBERT K. GOOD		56.95	
8	300250	ZACHARY D. BAKER		63.27	
9	Grand Total			222.9	
0					
11					

The resulting report is easy to read.

Other Cool Things to do with a Pivot Table - Part Seven

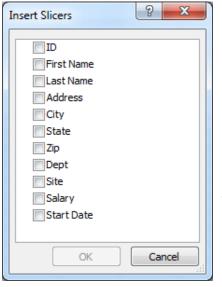
Report Filters

After dragging the site into the report filter drop zone, notice the filter that appeared on row 1 which includes the Site (label of field dragged into the filter zone) and the dropdown box in column B which will display all of the sites when the chevron is selected.

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								\$
	А	В		С	D		PivotTable Field List	▼ ×
1	Site	(All)	-			-l'		
2							Choose fields to add to	report:
3		Count of Last Na	ne A				ID	
4	Alternative Ed		5	\$59,56			First Name	
5	Business Services		5	\$40,80				
6	ECS		4	\$60,02			Last Name	
7	Food Services		5	\$40,53	0		Address	-
8	Graphics		5	\$46,98	5		City	
9	Human Resources		5	\$54,89	9		D	
10	Info Technology		5	\$43,95	8		Drag fields between an	
11	Inst Services		5	\$48,88	2		Report Filter	Column Labels
12	Maint/OPER		5	\$43,82	4		Site 🔻	∑ Values 🔻
13	Project SHARE		5	\$75,75	5			
14	SELPA		5	\$56,32	2			
15	Special ED		5	\$63,10	4			D
16	Superintendent		5	\$56,46	7		Row Labels	Σ Values
17	Transportation		5	\$50,12	0		Dept 🔻	Count of Last 🔻
18	WES Camp		4	\$34,23	4			Average of S 🔻
19	Grand Total		73	\$51,82	4			
20								
<u>21</u> ⊮ •	Blank ∕VLC	OOKUP / Filtering /	Calc	filtered data			Defer Layout Upda	te Update
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By selecting just 1644 Magnolia as the site, only the selected information will be displayed for those individuals whose site is 1644 Magnolia.

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1	Site	1644 Magnolia	T.			_						
2							Choo	ose fields to	o add to re	eport:	L	•
3		Count of Last Nam	e Av	-	-			D		-		
4	Alternative Ed		2	\$35				irst Name				<u> </u>
5	Business Services		3	\$33	901			istindille				-
6	Human Resources		3	\$41	901							
7	Info Technology		3	\$38	940			i fields betv	_			
8	Inst Services		1	\$54	234		Y	Report Filt	ter 🚦	Colu	imn Labe	els
9	Superintendent		3	\$61	881		Sit	e	-	Σ Valu	ies 🔻	1¢
10	Grand Total	1	5	\$43	638			Row Label		Σ Valu	oc.	
11												
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13						\mathbf{v}		Defer Layou	ut Undate		Updat	-
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Rea	ady							<u> </u>	6 -	$ \nabla$		+ <u>,;;</u>

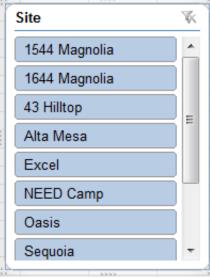


Report Slicers

Report filters are not too exciting; slicers on the other hand are super cool. By navigating to PivotTable Tools\Sort & Filter group and select **insert slicer**.

After selecting Site to filter by, a pop up appears with the list of all sites. One or many individual sites may be chosen to filter by. Holding down the shift or Ctrl keys work when selecting multiple items to filter by.

To remove the slicer, merely select the slicer pane and press the delete key.



Expanding Filter Results to Individual Tabs

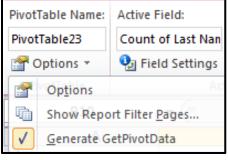
Returning to the report filters, there is one feature that gives the cool slicers a run for its money. Simply put, a single criteria element results may be shown on individual pages, or worksheet tabs.

Note the tabs below.

16 47 14 4 **b** bl Blank / VLOOKUP / Filtering / Calc_filtered data Sheet4 / PT 1 Data PT 2 Data PT 3 Data

Utilizing the site report filter that we have before; select PivotTable tools\Options within the PivotTable group. Then select the chevron to the left of Options and select **show report filter pages**.

	B13	- (0	<i>f</i> _x 5				~
1	А		В	С	=	PivotTable Field List	▼ X
Sit	te	(All)		r		Choose fields to add to	report:
						ID	
		Count o		Average of S		First Name	
	ternative Ed				9,567	✓ Last Name	
	isiness Services	3			0,807	Address	=
EC			4		0,028		
	od Services				0,530	City	
	aphics				6,985	State	
	iman Resources	6			4,899	Zip	-
	o Technology				3,958	Dent	
-	st Services			5 \$4	8,882	Drag fields between are	eas below:
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	oject SHARE	Project SH	ARE (Dept)		5,755	Site	Σ. Values T
	ecial ED	Row: Projec			6,322 3,104	Site	2 values •
	perintendent	nominoje			5,104 6,467		
	ansportation				0.120		
	ES Camp				4.234	Row Labels	Σ Values
	and Total		7		1.824	Dept 🔻	Count of Last 🔻
1	2				.,		Average of S 🔻
2							
3					_	Defer Layout Updat	te Update



Show Report Filter Pages	8 <mark>x</mark>
Show all report filter pages of:	
Site	*
	-
OK	Cancel

Only one filter can be utilized when filtering to pages. The show report

filters pages pop-up will appear from which you can only select one. Once **OK** is selected, Excel will do some quick magic. The tabs below is after the page filter has been applied.



Formatting as a Table - Part Eight

It is often best to format the source data area as a table, especially if it is data that has the potential of being appended. By formatting the data as a table, as additional rows are added at the bottom of the table, without any spaces, the data area automatically expands.

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	Tahoma • 12 • A A	= = *	General 🔹	
Paste 💞	B <i>I</i> <u>U</u> → <u>→</u> → <u>→</u> →	토콜콜 : : : : : : : : : : : : : : : : : :	\$ • % • • • • • • • • • • • • • • • • •	Conditional Format Cell Formatting + as Table + Styles +
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<u> </u>			 	 		Format As Table
						Where is the data for your table?
Medium					=	My table has headers
			 	 		OK Cancel

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1	ID 🛛	🔹 🛛 First Name 🖸	🖌 🛛 Last Name 🔽	Address	🔹 City 🖃
2	300002	George	Washington	32490 Highway 299E	San Diego
3	300004	John	Adams	3662 Fairoaks Court	Santa Barba
4	300006	Thomas	Jefferson	22086 Wesley Drive	San Jose
5	300008	James	Madison	17757 Flowers Lane	San Diego
6	300010	James	Monroe	1125 Gold Street	Santa Barba
7	300012	John	Adams	751 Hilltop Drive #74	San Jose
8	300014	Andrew	Jackson	422 Shell Drive	San Diego
9	300016	Martin	Van Buren	7788 Justice Mine Road	Santa Barba
10	300018	William	Harrison	17280 North Fork	San Jose
11	300020	John	Tyler	1973 Sycamore Drive	San Diego 👻
14 4	H Part 1	l 🖉 Part 2 🖉 PT 1 Data	PT 2 Data Sheet5		
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	Formatting Data as a Table
	Select a cell within your data area. From the Home tab, select format as a table from the styles group.
2	Select the format I want. Choose light in this example.
3	Excel guesses the data area. Modify if necessary. Select OK
4	This is an example of the light table format.

If the table format is no longer desired you may turn off the 'table formatting' by navigating to \table tools\ tools and select the convert to range option.

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3	0000	5200	5211	0000		520	90	10528300	ZACHARY D. BA	KER E	X12-08818	AUG11	MLGE ZB-JA	
4	0000	5200	5211	0000		520	90	10528326	ROBERT K. GO	DD E)	X12-08791	AUG11	MLGE BG-JA	
5	0000	5200	5211	0000		520	90	10528334	SHANNON I. HE	TZEL E	X12-08782	AUG11	MLGE SH-JA	
6	0000	5200	5211	0000	7700	520	90	10528336	KENDELL L. KIL	BORN EX	X12-08780	AUG11	MLGE KK-JA	
7	0000	5200	5211	0000	7700	520	90	10530220	JAMES W. ALS	PACH E	X12-11734	SEP11 N	MLGE JA-DO	
8	0000	5200	5211	0000	7700	520	90	10530224	ZACHARY D. BA	KER E	X12-11728	SEP11 N	MLGE ZB-JA	
9	0000	5200	5211	0000	7700	520	90	10530261	SHANNON I. HE	TZEL E	×12-11687	SEP11 N	MLGE SH-JA	
4.0	0000	5200	5211	0000		520			KENDELL L. KIL					
10	0000	5200	5211	0000										
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1	Site		(All)		-				٦	· · · · · · ·				_	
2							·	- 1	Ш	Choose	fields to add	to report			-
3	Departments		Values	Last	Harmo	Augener	of Salary		Ш		neius to aut	rtorepon			
4	Alternative Ed	5 🕛	Count of	Last	Name /	Average	\$53,567		Ш	ID					^
6	Business Serv	_			5		\$34,807		Ш	First	Name				
7	ECS				4		\$60,028		Ш	✓ Last	t Name				=
8	Food Services				5		\$40,530		Ш	Addr	ess				
9	Graphics				5		\$46,985		Ш	City					
	Human Resour				5		\$54,899		Ш	Stat	•				
11	Info Technolog	JY .			5		\$41,958 \$44,882		=	Zip	-				
13	Maint/OPER				5		\$41,824		Ш						
	Project SHARE				5		\$75,755		Ш	D					
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17	Superintenden				5		\$56,467		Ш	Site		Σ	Value	s	-
18	Transportation WES Camp	1			5		\$44,120 \$34,234		Ш						
20	Grand Total				73		\$49.084		Ш	Ro	w Labels	Σ	Value	s	
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		art 1	/Part 2	ZP	T 1] ◀ [
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- Report filters is similar to a page break.
- By dragging Site to Report Filter, the filter appears above the pivot table.
- Note the site filter, in cell B1, displays All; and the grand total count is 73.
- By selecting the chevron, a drop down appears, select 1644 Magnolia.
- The second picture displays only those employees at 1644 Magnolia and now display 15 employees.

1	Site	1644 Magnolia 🛛 🗃	
2			
3		Values	
4	Departments 🔄	Count of Last Name	Average of Salary
5	Alternative Ed	2	\$20,234
6	Business Services	3	\$30,567
7	Human Resources	3	\$41,901
8	Info Technology	3	\$35,607
9	Inst Services	1	\$54,234
10	Superintendent	3	\$61,881
11	Grand Total	15	\$40,305