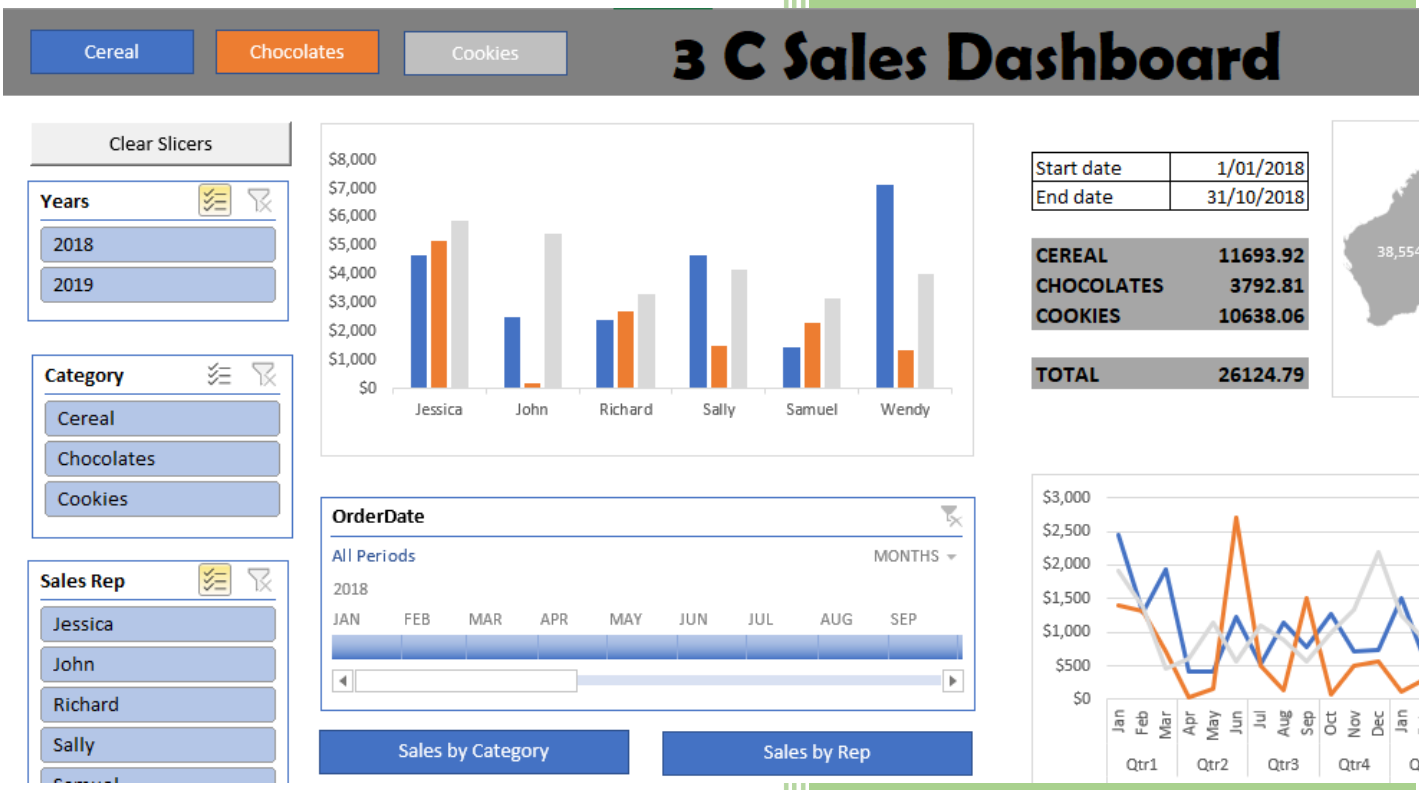
Data &
Dashboards

Office 365 Microsoft Excel



Excel Advanced

iTeachers

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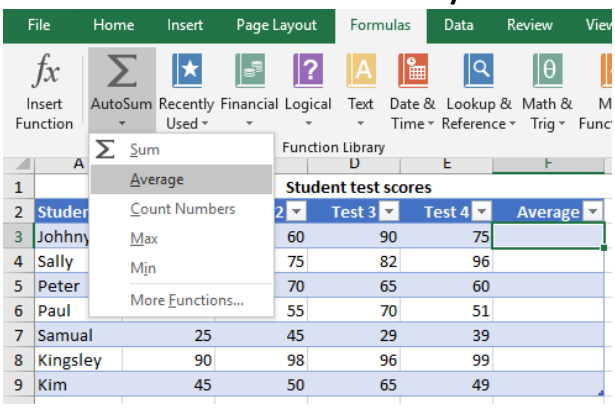
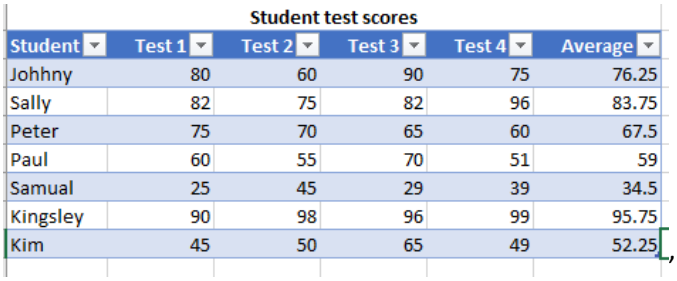
Excel training - Advanced

Average sum

1. Open the **Excel training – Advanced** workbook
2. Select the sheet **12. Average, Min & Max**
3. Select cell **F3**
4. Select the **Formulas > Function library > AutoSum** drop down menu and select **Average**



5. Press **Enter**, the formulas should automatically add down as we are working in a table



Student test scores

Student	Test 1	Test 2	Test 3	Test 4	Average
Johhny	80	60	90	75	76.25
Sally	82	75	82	96	83.75
Peter	75	70	65	60	67.5
Paul	60	55	70	51	59
Samual	25	45	29	39	34.5
Kingsley	90	98	96	99	95.75
Kim	45	50	65	49	52.25

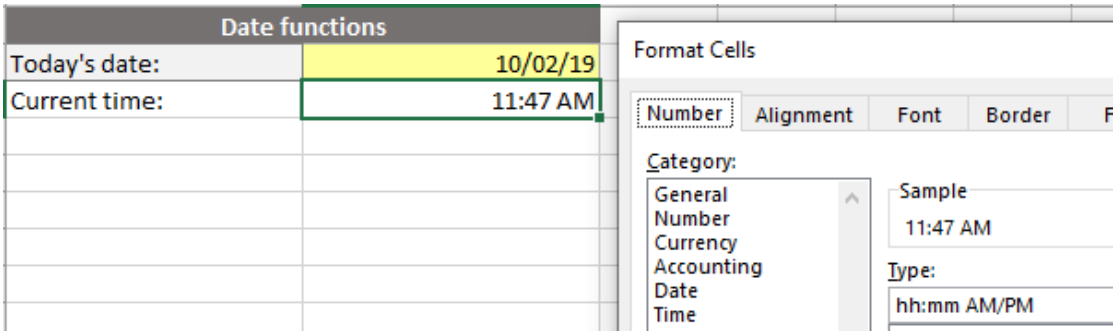
Minimum and Maximum

1. Select cell **G2**
2. Create the heading **Maximum,** and select **Enter** or **Tab**
3. Select cell **H2**
4. Create the heading **Minimum,** and select **Enter** or **Tab**
5. Select cell **G3**
6. Type in the formula **=MAX(B3:E3)**
7. Select cell **H3**
8. Type in the formula **=MIN(B3:E3)**

	A	B	C	D	E	F	G	H
1	Student test scores							
2	Student	Test 1	Test 2	Test 3	Test 4	Average	Maximu	Minimu
3	Johhny	80	60	90	75	76.25	90	60
4	Sally	82	75	82	96	83.75	96	75
5	Peter	75	70	65	60	67.5	75	60
6	Paul	60	55	70	51	59	70	51
7	Samual	25	45	29	39	34.5	45	25
8	Kingsley	90	98	96	99	95.75	99	90
9	Kim	45	50	65	49	52.25	65	45

Date and Time

1. Open **13. Date and Time** worksheet
2. In cell **B2** type in the formula **=today()**
3. Press **Enter**
4. **In cell B3 type in the formula = NOW()**
5. Right mouse click on cell **B3**, select **Formal Cells**, under the **Number** tab, select **Custom** and then type the format **hh:mm AM/PM** in the Type box
6. Click **OK**



How to merge two tables in Excel with formulas

Join tables using VLOOKUP

If you are wanting to join two tables together based on one column, then VLOOKUP is a very easy formula to use. We have 2 tables, one called 14. Merge Main and the second one is 14. Merge lookup. The first table contains the seller name and product and the lookup table contains the names and amounts. You want to combine these two tables by matching data from the seller column. The order of the names in both columns is different, so that is why a copy and paste won't work.
The formula we are using is the VLOOKUP

=VLOOKUP(lookup_value, table_array, col_index_number, [range_lookup])

Seller	Product	Amount
John	Apple	
Sally	Orange	
David	Mangoe	
Steven	Lemon	
Liz	Pear	
Geoff	Blueberries	
Brad	Bananas	

Seller	Amount
Brad	15.95
David	85.96
Geoff	25.36
John	52.89
Liz	17.25
Sally	58.54
Steven	15.55

1. Select the sheet **14. Merge Main**
2. To combine the two tables by a matching column (seller), you enter this formula in cell C2 in the main table

   Type in the formula **=VLOOKUP($A2, '14. Merge lookup'!$A$2:$B$8, 2, FALSE)**

   - **lookup_value - $A2** is the value you are looking for
     Notice that there is a **$** sign before the A. This means absolute cell reference Excel's default formula notation uses relative cell references. Relative references automatically change when you copy cells with the clipboard or fill handle, making it easier to reuse formulas. In cases where you need Excel to keep the exact cell referenced in a formula, switch the formula to use absolute references by pressing "F4" to add a dollar sign to the equation.

   - **table_array - '14. Merge lookup'!$A$2:$B$8** – is the table to search. We have named the table as lookupSeller, so this formula could be replaced as

     =VLOOKUP($A2, LookupSeller, 2, FALSE) - where we are just referencing the table name

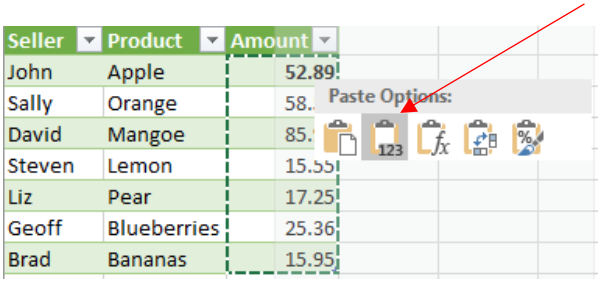
- **col_index_number** - 2 is the number of the column from which to retrieve the value.
- **[range_lookup]** - Optionally, you can specify TRUE if you want an approximate match or FALSE if you want an exact match of the return value. If you don't specify anything, the default value will always be TRUE or approximate match.

Please be aware that Excel VLOOKUP has several limitations, the most critical of which are 1) inability to pull data from a column to the left of the lookup column and 2) a hardcoded column number breaks a formula when you add or remove columns in the lookup table.

Convert VLOOKUP values to absolute cell reference

Once you have merged your data you can now change the formula to be just the values. This will mean that the data is not relying on the second table.

1. Select cells **C2** to **C8**
2. Press **Ctrl + C** to copy
3. The right click and select **Paste Options**, click **values**



4. Go to cell **C2** and notice that the cell is just a value and not a formula

How to merge two tables in Excel with Power Query

We are going to use the same data, but this time use the Power Query. Power Query can save you a lot of time when you need to merge tables with different sizes and columns based on a matching column.

1. Delete Column C in Table 1

TABLE 1 – MAIN TABLE

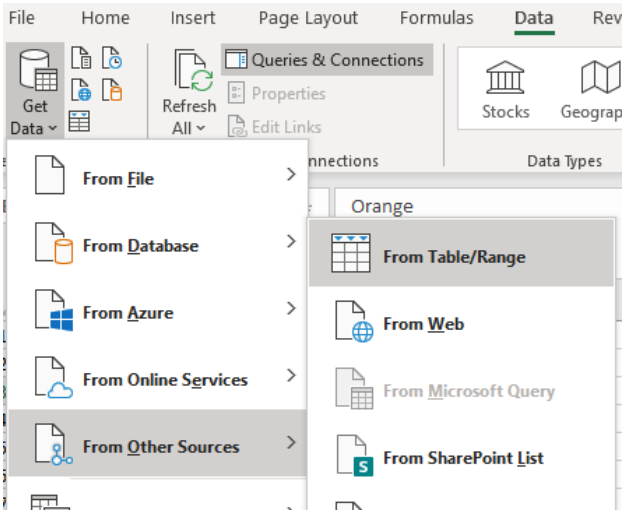
	A	B	C
1	Seller	Product	Amount
2	John	Apple	
3	Sally	Orange	
4	David	Mango	
5	Steven	Lemon	
6	Liz	Pear	
7	Geoff	Blueberries	
8	Brad	Bananas	

TABLE 2 – AMOUNT TABLE

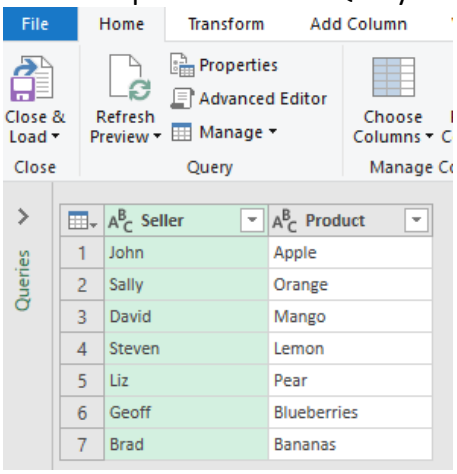
Seller	Amount
Brad	15.95
David	85.96
Geoff	25.36
John	52.89
Liz	17.25
Sally	58.54
Steven	15.55

2. Select the table 1 – Main Table, but clicking in any cell

3. To merge tables, you first need to convert these tables into connections in Power Query. Once you have the connections, you can easily merge these. Select the **Data Tab > From Other Sources > From Table/Range**

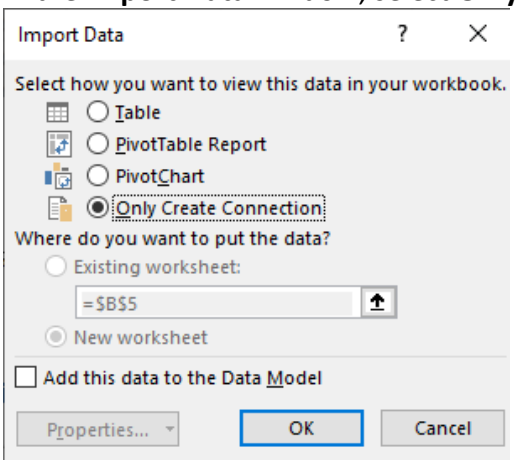


4. This will open the Power Query editor, showing your table



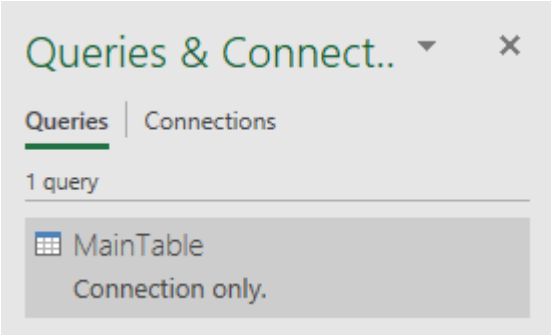
5. In the Query editor, click **the File Tab**, then **Close and Load To** option

6. In the **Import Data** window, select **Only Create Connection.**

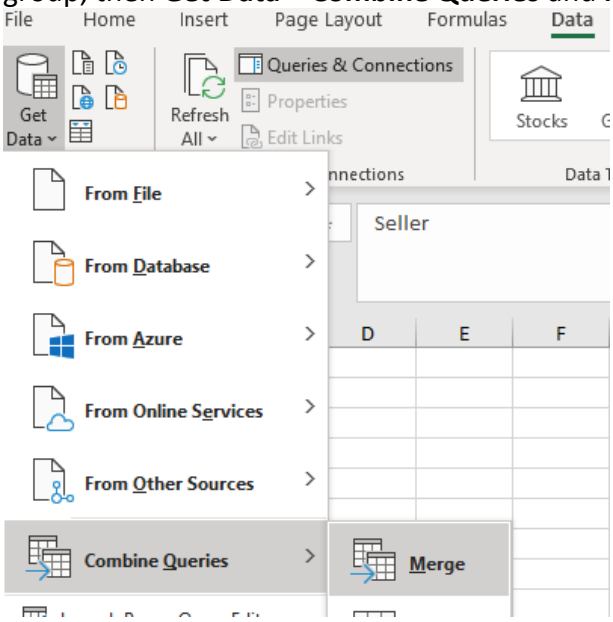


7. Click **OK.**

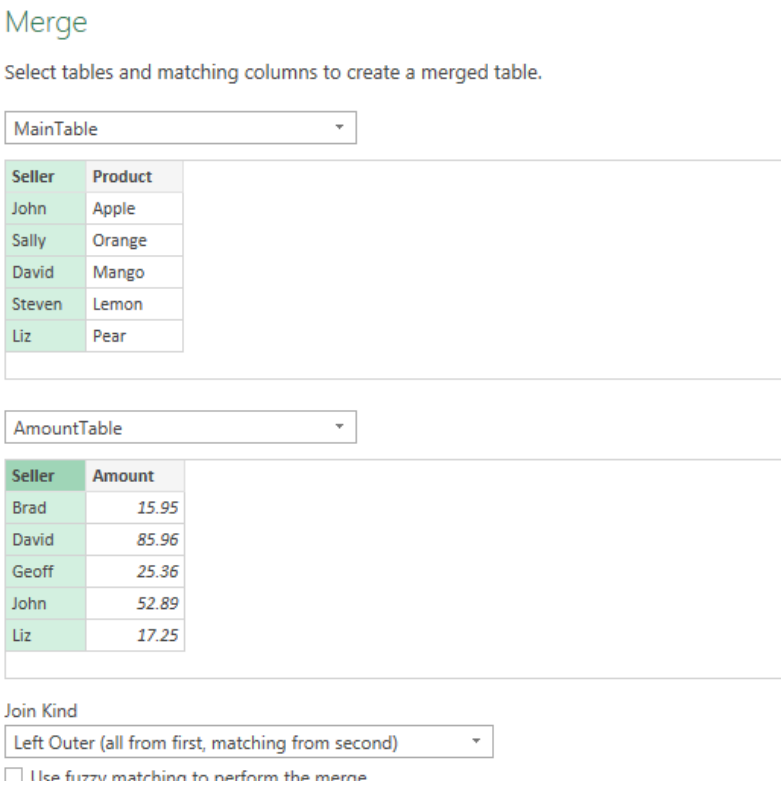
8. The data has created a connect that is now displayed on the right hand side of the screen.



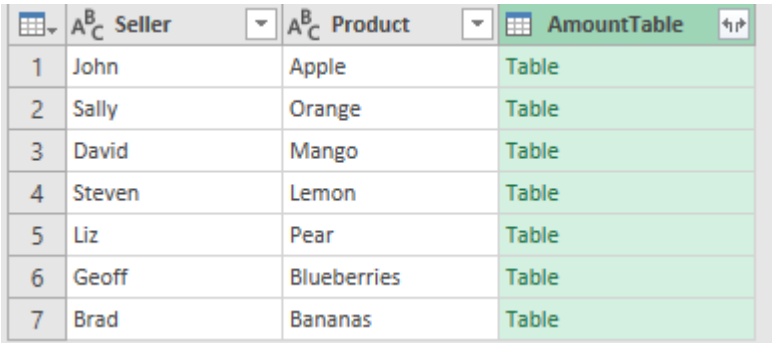
9. Select the **14. Merge Lookup worksheet**
10. Select the Amount Table
11. Select **Get Data > From Other Source > From Table Range**
12. Select File > Close and Load To
13. In the **Import Data** window, select **Only Create Connection**
14. To connect the tables together, select the **Data** tab, then **Get & Transform Data** group, then **Get Data > Combine Queries** and **Merge**.



15. In the Merge table window select the Main Table in the first drop down box
16. Select the **Seller column** on the **Main Table**
17. column on the **Main table**
18. Then in the second table select the **Amount Table**
19. Select the **Seller column** on the **Amount Table**
20. Under Join kind, select Left Outer (all from first, matching from second)

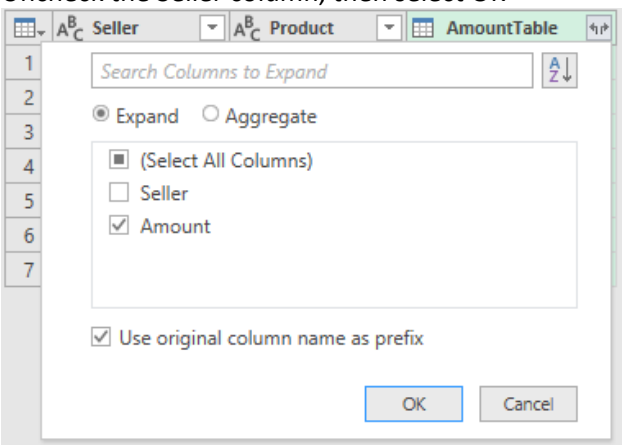


21. Select **OK**
22. In the Power Query editor select the icon to the right of the Amount Table column



	Seller	Product	AmountTable
1	John	Apple	Table
2	Sally	Orange	Table
3	David	Mango	Table
4	Steven	Lemon	Table
5	Liz	Pear	Table
6	Geoff	Blueberries	Table
7	Brad	Bananas	Table

23. Uncheck the Seller column, then select OK



24. Now select **Close and Load**

Seller	Product	AmountTable.Amount
John	Apple	52.89
Brad	Bananas	15.95
Sally	Orange	58.54
David	Mango	85.96
Geoff	Blueberries	25.36
Steven	Lemon	15.55
Liz	Pear	17.25

25. This has created a new worksheet with your data merged. Rename the spreadsheet to **Merge Data**

Excel Dashboards – Case study 3 C sales

Benefits

An Excel dashboard is a one page summary that contains important information which allows you to analyse your business.

About 3 C Sales

- The 3 C sales is a sales company that sells cookies, chocolates and cereals in Australia
- The 3 C sales has 6 sales reps

What are the goals of our dashboard?

The goal of a dashboard is to maximize the performance of a business. The dashboard can communicate key business information to colleagues and stakeholders. Such as highest sales per State, per sales rep or per product.

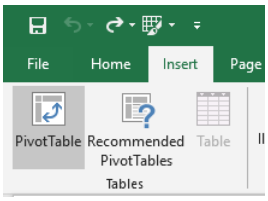
The pivot tables that we will create for our 3 C sales dashboard are:

- Sales per category
- Sales per Sales rep
- Sales per state
- Sales per product

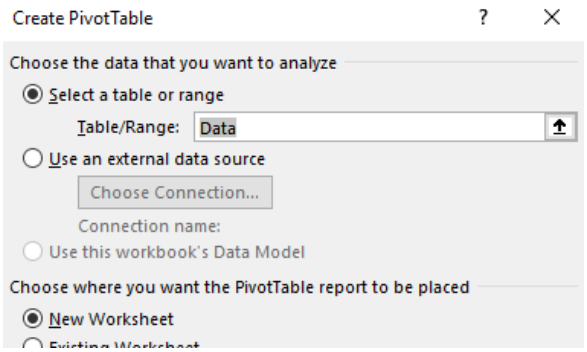
This data shows the date of the sale, the country and state, the sales rep, the category of product and product, the quantity of sales, unit price and total price.

Sales per category pivot table

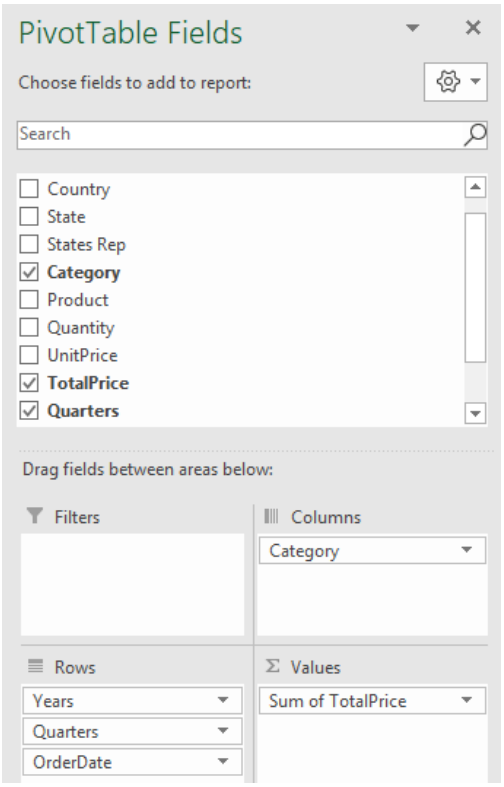
1. Open **15. Data sheet**
2. Select any cell in the **Data** table
3. Select **Insert** > **Tables > Pivot Table**



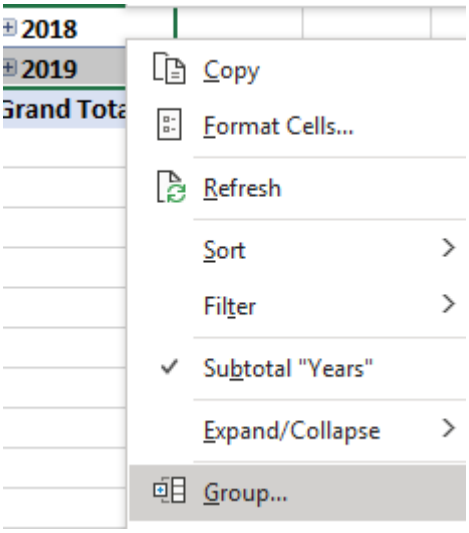
4. In the **Create PivotTable** window, the **Select a table or range** will have automatically selected our **Data** table. In the **Choose where you want the PivotTable report to be placed**, we are keeping the default **New Worksheet**.



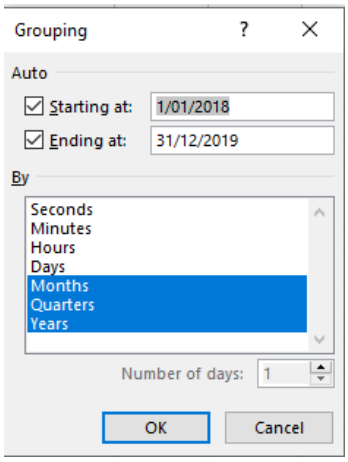
5. Click **OK**
6. Right **mouse click** on the new sheet and select **Rename**
7. Type in **Sales by category**
8. The **PivotTable Fields** pane appears, drag the following fields to the different areas
    - **OrderDate** to the **Rows** area – If you are using Excel 2016 it will automatically group the dates. If you don't want the dates to be grouped you could select Ungroup from the Analyse tab (or select Ctrl Z). If you don't have Excel 2016, you can group manually by right clicking on any date and then select Group, then group by Months and years. We are going to leave it grouped.
    - **Category** to **Columns** area
    - **TotalPrice** to **Values** area



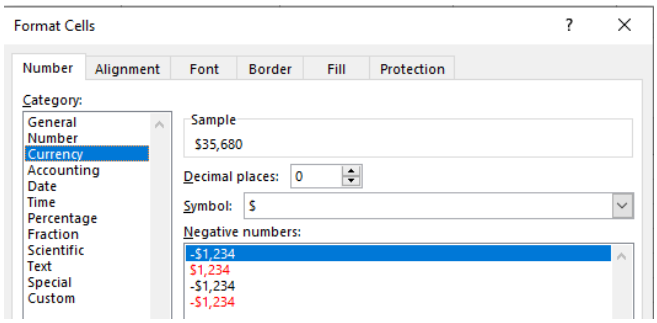
9. Select cells **A5** and **A6,** right mouse click and select **Group**



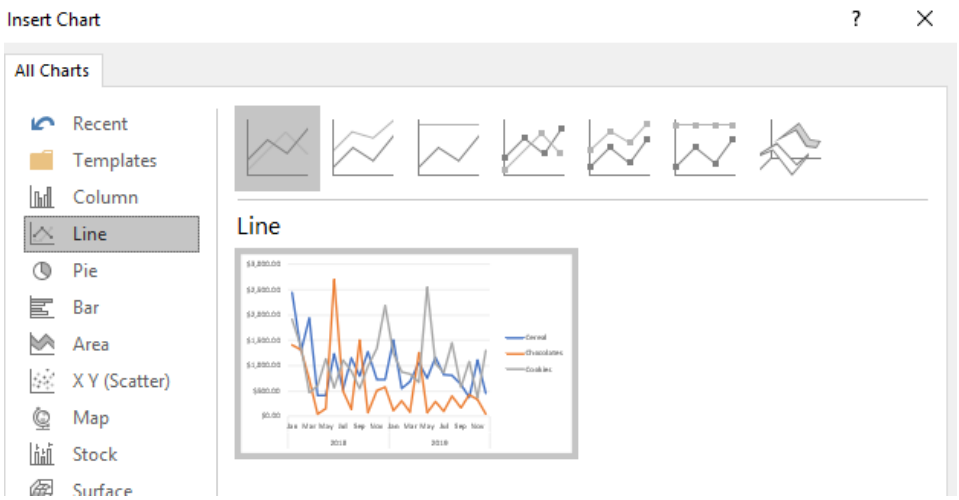
10. Make sure that **Months**, **Quarters** and **Years** are selected as the grouping option.



11. Click **OK**
12. Now give the PivotTable a name- **CategoryPivot**
13. Select cell **E5,** right mouse click, and select **Number Format**
14. In the Format Cells area select Currency and then 0 decimal places



15. Select **OK**
16. Select **Insert > Charts > PivotChart** drop down menu **> Pivot Chart**
17. From the **Insert Chart** window, select **Line** then click **OK**

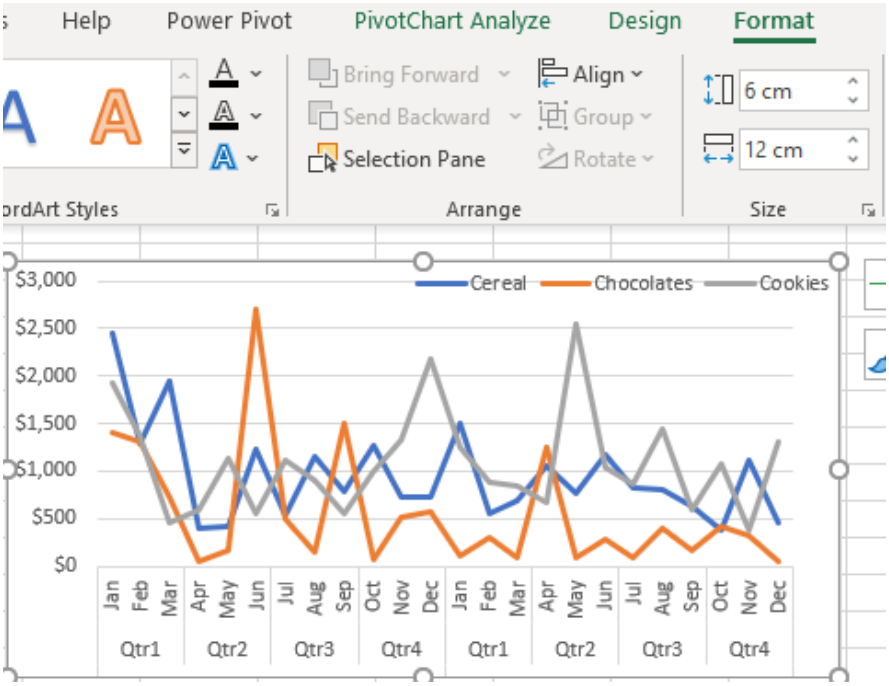


18. Drag the line graph to the right of your data
19. Right mouse click on the heading for **Sum of TotalPrice** and select **Hide all field buttons on chart**

20. Move the legend to the top right hand corner of the chart
21. Resize the graph to display all months
22. Create a new sheet on your workbook by selecting the plus sign
23. Rename new worksheet **Dashboard**
24. Drag the Dashboard sheet to just after **14.Merge lookup** sheet
25. Resize the columns in the Dashboard to the following

- **column A** and **column L to -** size 2
- **column B to column K** - size 9
- **column M and Column N** – size 13
- **column O through to column U -** size 9

26. Change Row 1 to height 45
27. Go back to your **sales by category** worksheet and click on the line graph (making sure only the outside borders are selected
28. Select **Format > Size >** Change the height to **6cm** and width to **12cm**

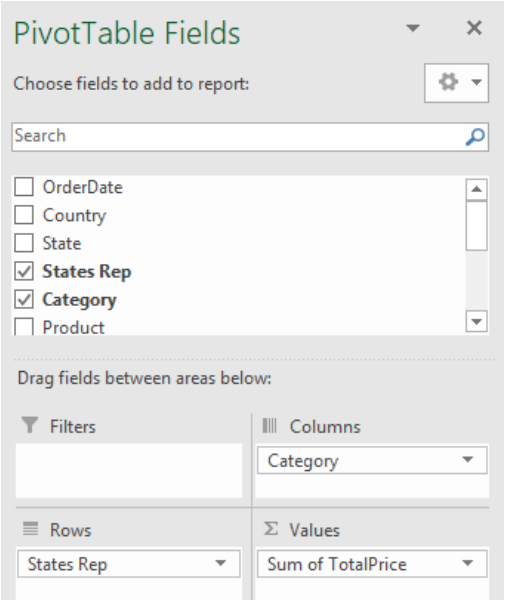


29. Hold down the **Ctrl button + X** (Which will cut the graph)
30. Now go over to the **Dashboard** sheet and press **Ctrl + V** to paste
31. Drag the graph to the top of cell **M14.** To get it to snap to grid, hold down the **Alt** key while moving the graph with you mouse

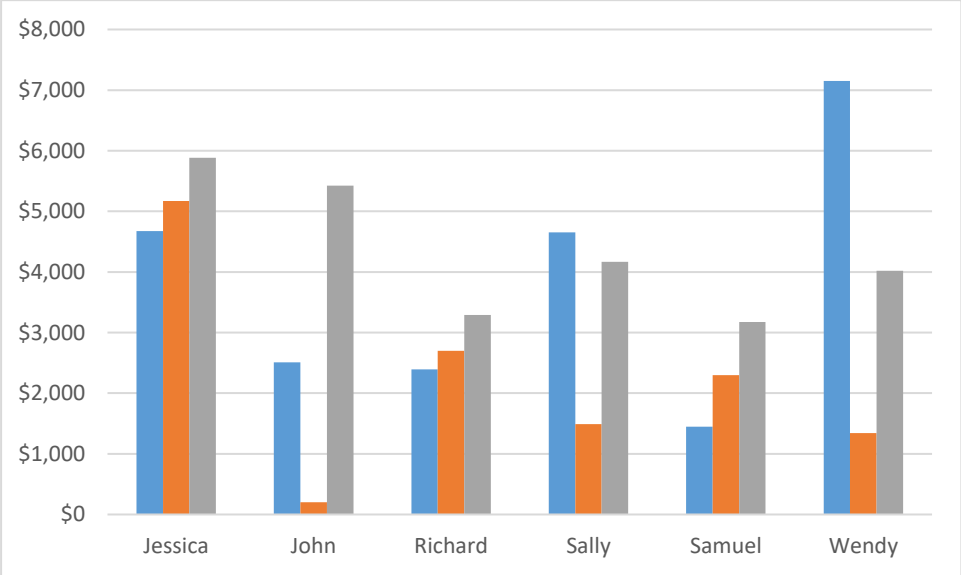
Sales by Rep Pivot Table

1. To ensure that all of the pivot tables share the same source data, we are going to copy from the **Sales by Category** sheet.
2. Select the **Sales by Category** worksheet
3. Hold down the **Ctrl** key, left click on the **Sales by Category** sheet and drag the sheet over to the next tab. A plus sign will appear
4. Rename the sheet **Sales by rep**
5. Rename the table to be **repPivot**
6. In the **PivotTable Fields** drag the following fields to the different areas
    a. **Category** to the **Columns** area
    b. **Sales Rep** to **Rows** area

c. **TotalPrice** to **Values** area



7. Now add a pivotable graph (column) as below, this time removing the legend

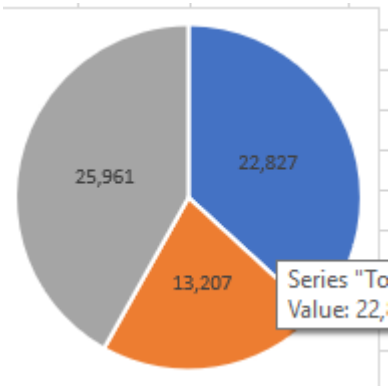


8. Select **Format > Size >** Change the **height to 6cm** and **width to 12cm**
9. Cut the graph using **Ctrl X**
10. Select cell **E3** on the **dashboard** worksheet, then past the chart at the top of this cell

Total sales Pie Chart

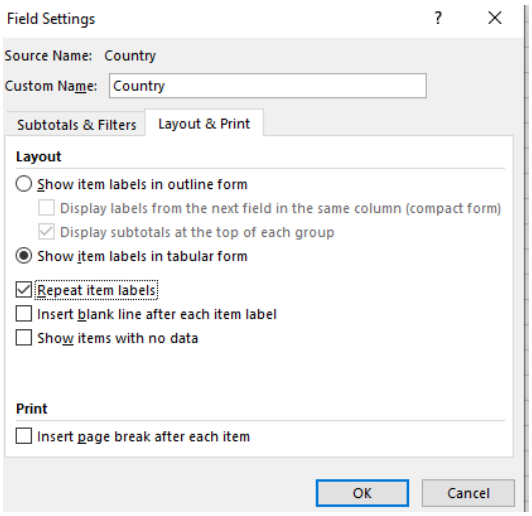
1. Copy sheet **Sales by rep**
2. Rename the new sheet **pie Chart**
3. Rename the table to be **PiePivot**
4. In the **PivotChart Fields**, drag the following fields to the different areas
    d. **Category** to the **Rows** area
    e. **TotalPrice** to **Values** area

5. Create a Pie PivotChart
6. Add **Data Labels,** remove the **Title, Legend** and **Sum of Totals**
7. Select **Format > Size >** Change the **height to 5cm** and **width to 5cm**
8. Remove the dollar sign from the data
9. Change the size of the Data Labels to 8
10. Copy the Pie Chart to the dashboard in cell **R3**

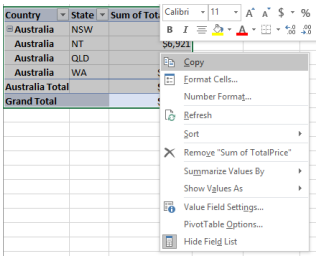


Sales by State

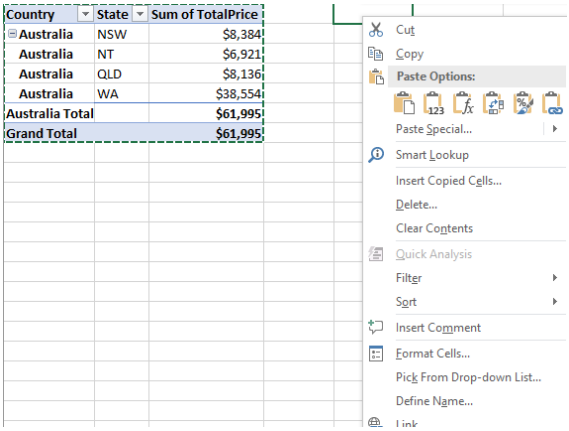
1. Copy sheet **Pie chart**
2. Rename the new sheet **Sales by State**
3. Rename the table **StatePivot**
4. In the **PivotChart Fields** drag the following fields to the different areas
    - **Country, then State** to the **Rows** area
    - **TotalPrice** to **Values** area
5. Right mouse click on the Australia under Row labels, select **Field Settings**, then **Layout and Print** tab, then click **Show item labels in tabular form** and check the tickbox for **Repeat item labels**



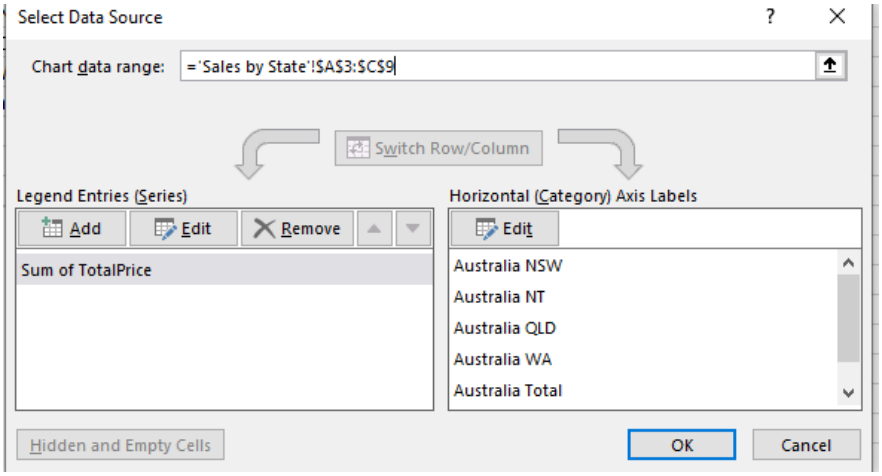
6. Click **OK**
7. This time you are going to create a Map Chart. However, this can't be in a pivot format. Select the full table (highlight all cells), right click and select copy



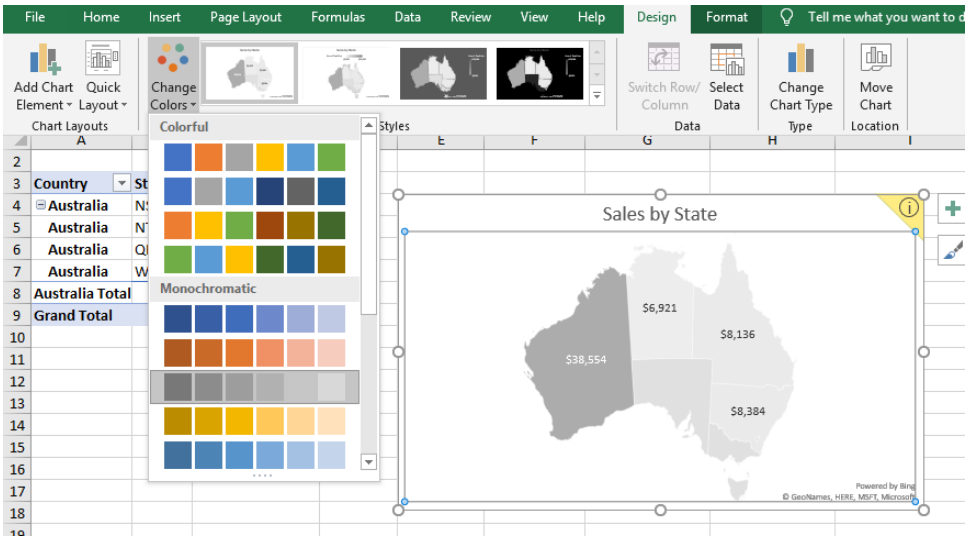
8. Move to cell **E3**, right mouse click and select Paste Options, then select values



9. Now select from cell **E3** to **G9**, then select **Insert** and then **Maps**
10. Right mouse click on the chart displaying a picture of Australia
11. Select the **Select Data**
12. Change the data source to ='Sales by State'!$A$3:$C$9 (or you can select all cells from A3 to C9 manually yourself)



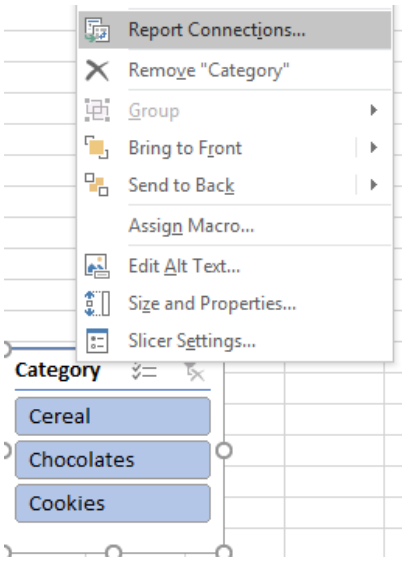
13. Click **OK**
14. Delete the copied data in cell **E3** to **G9**
15. On the Australia chart add data labels,
16. Select **Chart Design > Chart Styles >Change Colors**, use the drop down menu to change the color of the chart to be black and white



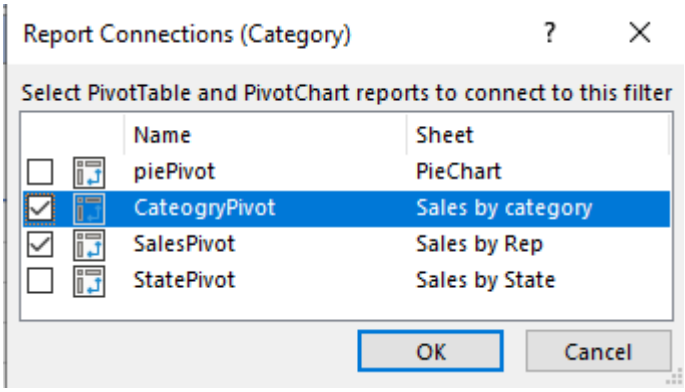
17. Remove the **legend** and the **chart title**
18. Change the size of the chart to the 5cm by 5cm
19. Copy the Australian graph to the Dashboard, place in cell **N3**

Adding Slicers to the Dashboard

1. Select the Dashboard sheet
2. Select the line Chart, then select **Insert** and **Slicer**
3. Add the slicers – **Category**, **Years** and **sales rep**, select **OK**
4. Right mouse click on the slicer **Years** and change **Slicer Settings** to **hide items with no data**
5. Right mouse click on the slicer **Category** and select **Report Connections**



6. In the report Connections, select the CategoryPivot and the SalesPivot. Do this for all slicers

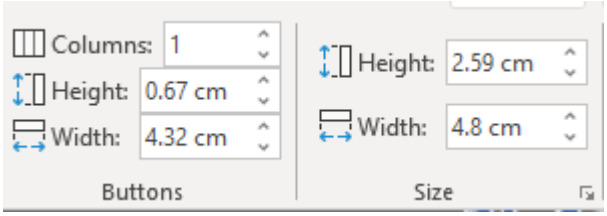


This will allow us to use the same slicer buttons for the Category and the sales graphs.

Formatting the Dashboard

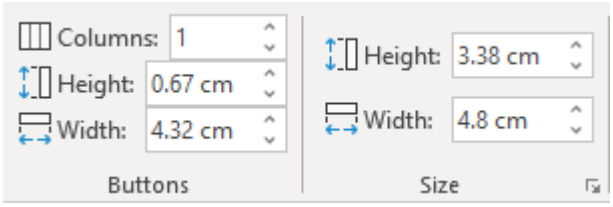
1. Highlight cells **A1** to **U1**, select **Home > Alignment > Merge and Center**
2. Right mouse click, then select Format Cells, then select Fill tab, then select a dark grey color
3. Type the heading in row 1 – ***3 C Sales Dashboard***
4. Change the **font** to **Berlin Sans FB Demi, size 36**
5. Move all slicers over to the left hand side of the dashboard
6. Change the size for the slicer buttons to the following

Years



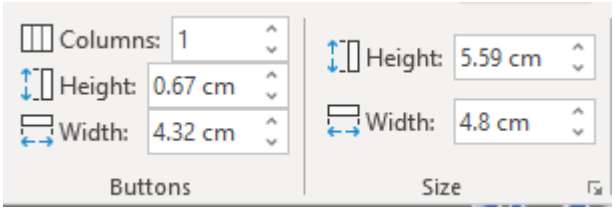
move to cell **B5**

Category



Move to cell **B11**

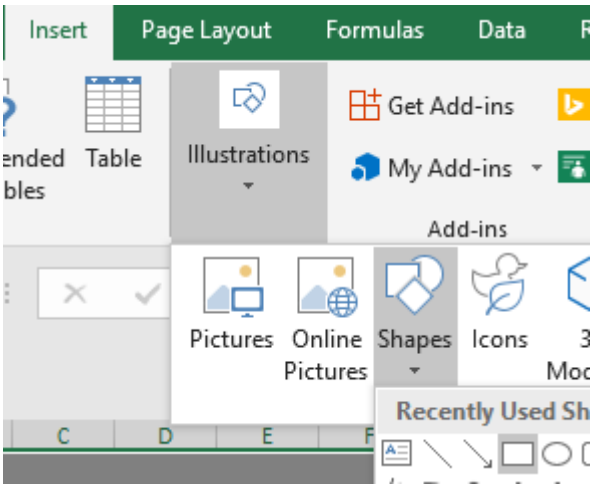
Sales Rep



Move to cell **B18**

Creating a legend for the dashboard header

1. Select **Insert > Illustrations > Shapes > Rectangle**



2. Create a rectangle 3cm by 0.8cm, color blue **(Shape Format > Size)**, place this shape on the heading bar at the top left of the worksheet
3. Right mouse click on the shape and select edit text, type in **Cereal,** align the text center (**Home > Alignment > Center**)
4. Copy and paste this shape, making the name being **Chocolates** and colour **Orange**
5. Copy and paste another shape calling this **Cookies** and the colour **light Grey**

6. These 3 shapes will become the new legend for your dashboard, you will be able to delete the legend on the line chart

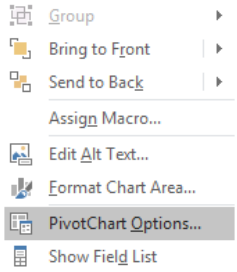
TIPS and TRICKS	**Snap to Grid -** When you draw, resize, or move a shape or other object in Excel, you can set it so that it will align or "snap" to the nearest intersection in the grid (even if the grid is not visible) or snap to other shapes or objects. However, you can control the alignment and snap-to capabilities by turning it off. **Shape Format > Arrange > Align > Snap to Grid**

Insert pictures

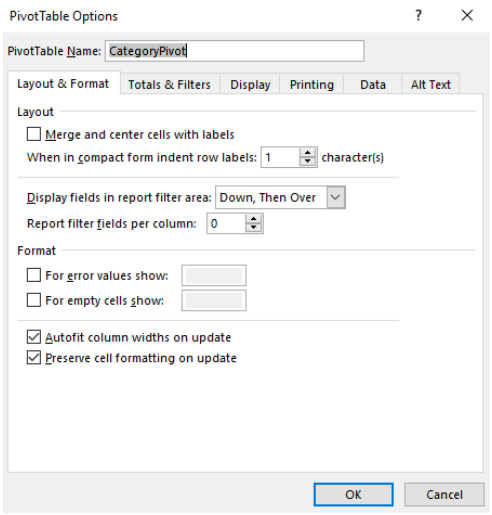
1. Select **Insert > Illustrations > Pictures**
2. Find the location of the 3PSales images
3. Place on the right hand side of the header

Fixing errors in graphs on the dashboard

1. From the sales rep slicer display only sales from Jessica
2. Notice that the line chart is not displaying data as a zero value, so we need to fix this
3. Select the line chart, then right mouse click and select **Pivot Chart Options**



4. On the Layout & Format, uncheck the tickbox – **For error values show and For empty cells show**



5. Click **OK**
6. Remove the legend from the chart as we now have this on the toolbar

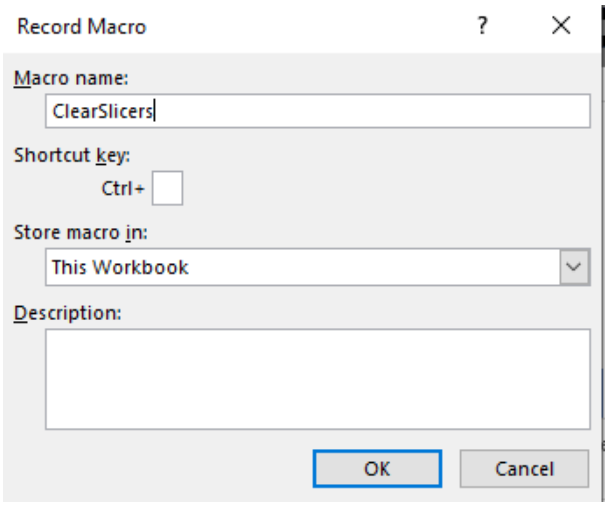
Clear slicers

To **clear** any **filters** applied, click the "**Clear Filters**" button in the upper-right corner of the **slicer** pane. To **delete** a **slicer**, select the **slicer** pane and then press the "Del" or "**Delete**" key on your keyboard. We are going to create a clear slicer button using a Macro

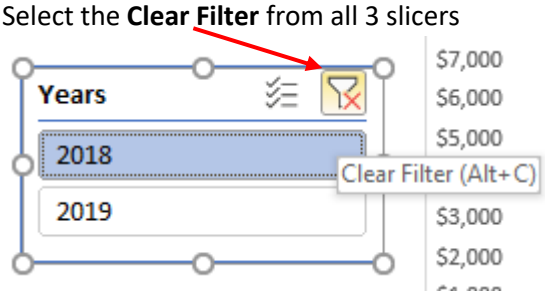
1. The **Developer** tab isn't displayed by default, but you can add it to the ribbon. **File > Options > Customize Ribbon.**
2. Under **Customize the Ribbon** and under **Main Tabs**, select the **Developer** check box.

   After you show the tab, the **Developer** tab stays visible, unless you clear the check box or have to reinstall a Microsoft Office program.

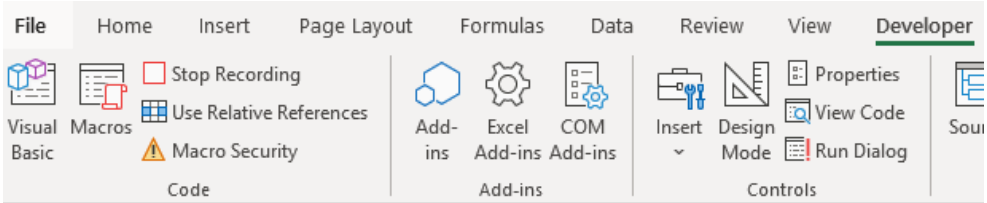
3. Select **2018** from the **Year** Slicer
4. Select **Cereal** from the **Category** slicer
5. Select **Jessica** from the **Sales Rep** slicer
6. From the **Developer** tab, select **Record Macro,** in the **Code** group
7. Name the Macro – **ClearSlicers**



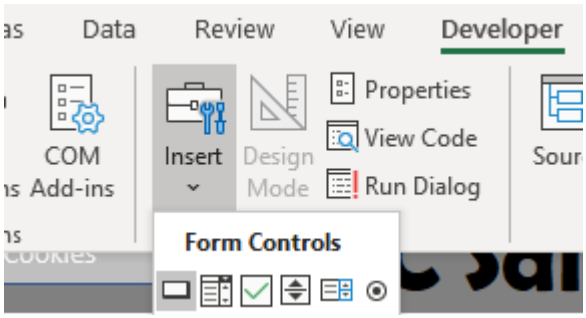
8. Select **OK**
9. Select the **Clear Filter** from all 3 slicers



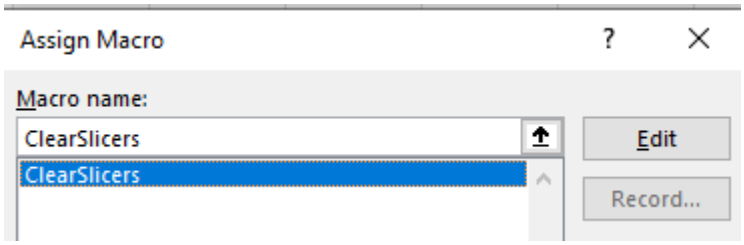
10. From the **Developer** tab, select **Stop Recording** from the **Code** group



10. Select cell **B3,** select **Developer > Controls > Insert > Form Controls >** then select the **Button**



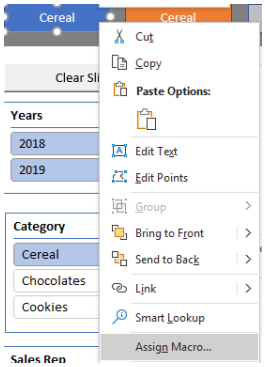
11. Make a button in cell B3 around 4.8cm in width and 0.8cm in height (user the Shape Format tab) to be the same as your slicer blocks.
12. In the **Assign Macro** window, select **ClearFilters** and press **OK**



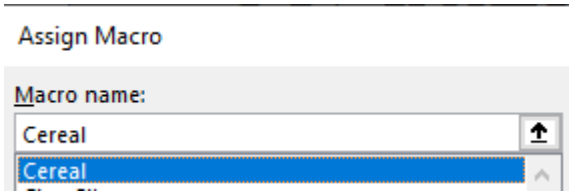
13. Right mouse click on the button and select Edit Text
14. Rename the button **– Clear Slicers**
15. Test your button by selecting various slicers and then using the Clear Slicers

Making our Legend buttons interactive

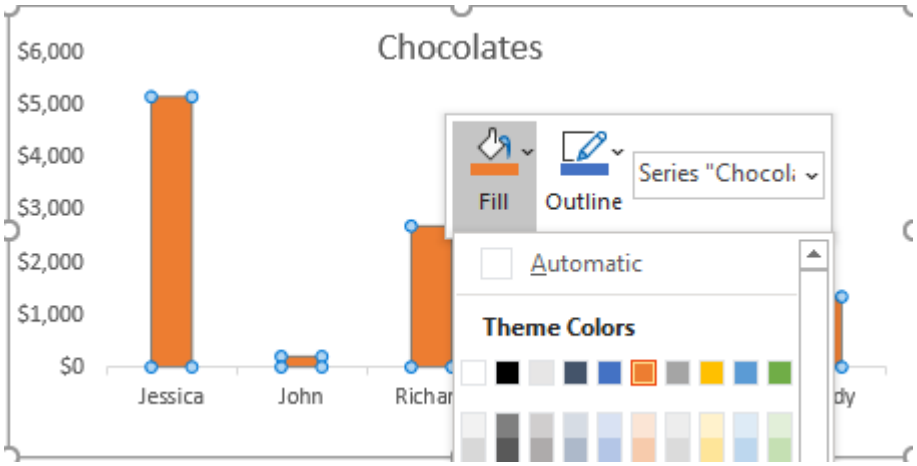
1. Select **Developer > Code > Record Macro**
2. Name the Macro **Cereal**, then click **OK**
3. On the Slicer Category, select the Cereal button
4. Select **Developer > Code > Stop Recording**
5. Right mouse click on the Cereal button and select Assign Macro



6. Select the Cereal Macro and press **OK**

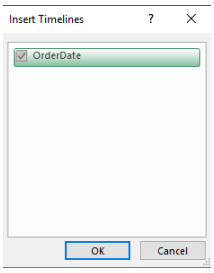


7. Do the same steps for the Chocolate and Cookies button, however this time also add change the color on the graphs when recording the macro. You can do this by right clicking on the graph and then using the drop down Fill menu to select the color that is the same as the legend.

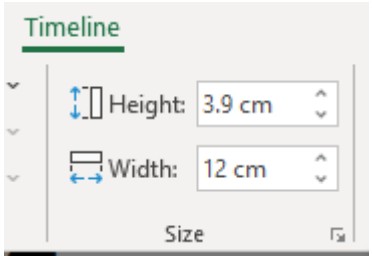


Adding a Timeline

1. Select the Sales column graph
2. Select **PivotChart Analyze > Filter > Insert Timeline**
3. Click **Order date**, then select **OK**

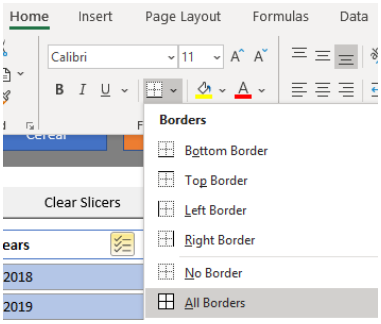


4. Drag down to cell E15
5. Select **Timeline > Size and** change **height** and **width**



TOTAL CATEGORY USING THE FORMULA SUMIFS

1. In cell **M4** type in **Start date**
2. In cell **M5** type in **End date**
3. In cell **N4** type in the data **01/10/18**
4. In cell **N5** type in the formula **=today()**
5. Highlight cells **M4** to **N5**
6. Select **Home > Font > Borders > All Borders**



7. In cell **M6** type in **Cereal**
8. In cell **M7** type in **Chocolates**
9. In cell **M8** type in **Cookies**
10. In cell **M10** type in **Total**
11. In cell **N6** type in type in the formula
12. **=SUMIFS(Data[TotalPrice], Data[Category], "cereal", Data[OrderDate], ">="&N4, Data[OrderDate], "<="&N5)**
13. In cell **N7** type in the formula
14. **=SUMIFS(Data[TotalPrice], Data[Category], "Chocolates", Data[OrderDate], ">="&N4, Data[OrderDate], "<="&N5)**
15. In cell **N8** type in the formula
16. **=SUMIFS(Data[TotalPrice], Data[Category], "Cookies", Data[OrderDate], ">="&N4, Data[OrderDate], "<="&N5)**
17. Highlight from cells N6 to N10 and use the SUM to create a total

SYNTAX FOR SUM IFS

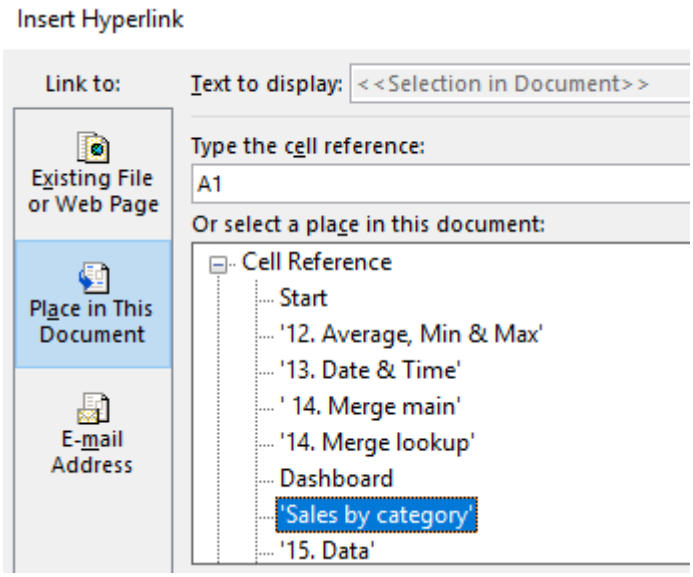
=SUMIFS (sum_range, range1, criteria1, [range2], [criteria2], ...)
Arguments
Sum range - The range to be summed.
range1 - The first range to evaluated.
criteria1 - The criteria to use on range1.
range2 - [optional] The second range to evaluate.
criteria2 - [optional] The criteria to use on range2.

Excel's SUMIFS function sums cells in a range using supplied criteria. Unlike the SUMIF function, SUMIFS can apply more than one set of criteria, with more than one range

Note that we need to enclose the logical operators in double quotes ("") then join with cell references using an ampersand (&).

Hyperlink buttons

1. In cell **E24** create a rectangle shape that will be used as a hyperlink button
2. Create the size 0.8cm x 5.7cm
3. Right mouse click to Edit the name to be Sales by Category
4. Right mouse click to add a Link



5. Link to – **Place in This Document** and select **Sales by category**
6. Select **OK'**
7. Copy this button and create another one in cell **I24**
8. Call this one Sales by Rep and link to the corresponding worksheet
9. Save your document
10. Adjust your page in any way that will make it look better