

Creating a Pie Chart and A Bar Chart from Sarah's Survey (Shown as Figure 10.7 in the book) – includes Introduction to Pivot Tables and the COUNTIF function [Uses Microsoft Excel® 2016]

In this example we will first recreate the pie chart which appears in the book as Figure 10.7.

This chart depicts how many people chose various types of drinks.

The survey data is reproduced below. Question 7 data is outlined below in red:

Respondent	Q.1 Alone?	Q.2 Freq visits	Q.3 Freq buy books	Q.4 Combine café	Q.5 thoughts café	Q.6 Buy in café	Q.7 drinks	Q.8 snacks	Q.9 How much £ Spend	Q.10 Gender	Q.11 Age	Q.12 Comments
1	1	1	3	2	5	1	1	4	3	1	4	
2	2	3	7	1	4	1	2	2	4	2	6	
3	2	3	6	1	5	1	3	2	5	2	5	
4	2	4	5	4	3	1	2	4	6	1	1	
5	1	7	7	3	5	1	4	2	7	2	6	
6	1	3	4	3	2	2	7	5	5	2	4	
7	2	4	7	2	4	1	1	1	3	2	3	Would like play area for kids
8	2	4	6	1	5	1	2	1	4	2	3	
9	3	4	6	2	5	2	1	2	5	2	4	
10	1	3	3	2	4	1	1	4	2	2	2	
11	4	4	5	2	2	1	7	4	5	2	2	
12	4	5	5	1	4	1	6	1	2	1	2	
13	4	4	6	2	4	1	5	1	3	1	2	
14	4	4	7	3	3	1	4	4	3	2	2	
15	2	3	6	1	4	1	5	1	8	2	5	no box for quiche or salad
16	2	3	5	2	5	1	2	1	6	2	7	
17	1	4	4	1	3	1	1	5	2	1	5	
18	3	2	3	2	5	1	2	5	2	1	6	
19	2	4	4	3	4	1	1	2	8	1	2	would like croissants
20	2	4	4	4	4	1	1	4	7	1	3	
21	1	4	5	3	3	1	6	1	6	2	2	
22	1	7	7	3	4	1	7	1	4	2	2	
23	2	3	4	4	1	2	7	5	5	2	3	
24	1	3	4	1	2	1	1	1	4	1	5	
25	2	1	2	2	1	1	7	2	4	1	6	
26	3	2	2	2	1	1	7	5	5	2	3	
27	1	3	3	3	3	1	3	4	3	1	4	
28	2	4	6	1	4	1	2	3	7	2	5	
29	2	4	7	2	5	1	2	1	10	2	6	
30	1	4	5	2	3	1	1	4	4	1	1	

Recall what the codes mean – please see reminder below:

7. If we had a café in the bookshop which one of the following drinks might you buy (please tick)?

Coffee	☐	1
Tea	☐	2
Fruit Juice	☐	3
Bottled Water	☐	4
Hot Chocolate	☐	5
Smoothie	☐	6
None of the above	☐	7

Creating a Summary Chart of the Count of Categories of Data from your Spreadsheet data

STEP 1

The first thing we have to do is to create a table in Excel® which summarizes how many times each type of drink was chosen by our survey respondents (remember there were 30 respondents in total).

We could go through the Excel® spreadsheet and count the number of 1's, 2's, 3's etc. (codes for different drink types) and enter this manually into a table in Excel®.

However, that is not a very clever way to do it – for one thing we might miscount, and it would take a long time for a large survey. What we should do is to manipulate, in Excel®, the data we have already entered into the survey spreadsheet. The following section 1.1 shows how to summarize your data into a **Pivot table** which you can then use to draw charts. Section 1.2 shows an alternative way to do this using the '**COUNTIF**' function in Excel®.

Skip this section if you can already do this and go directly to STEP 2 for a pie chart and STEP 3 for a bar chart.

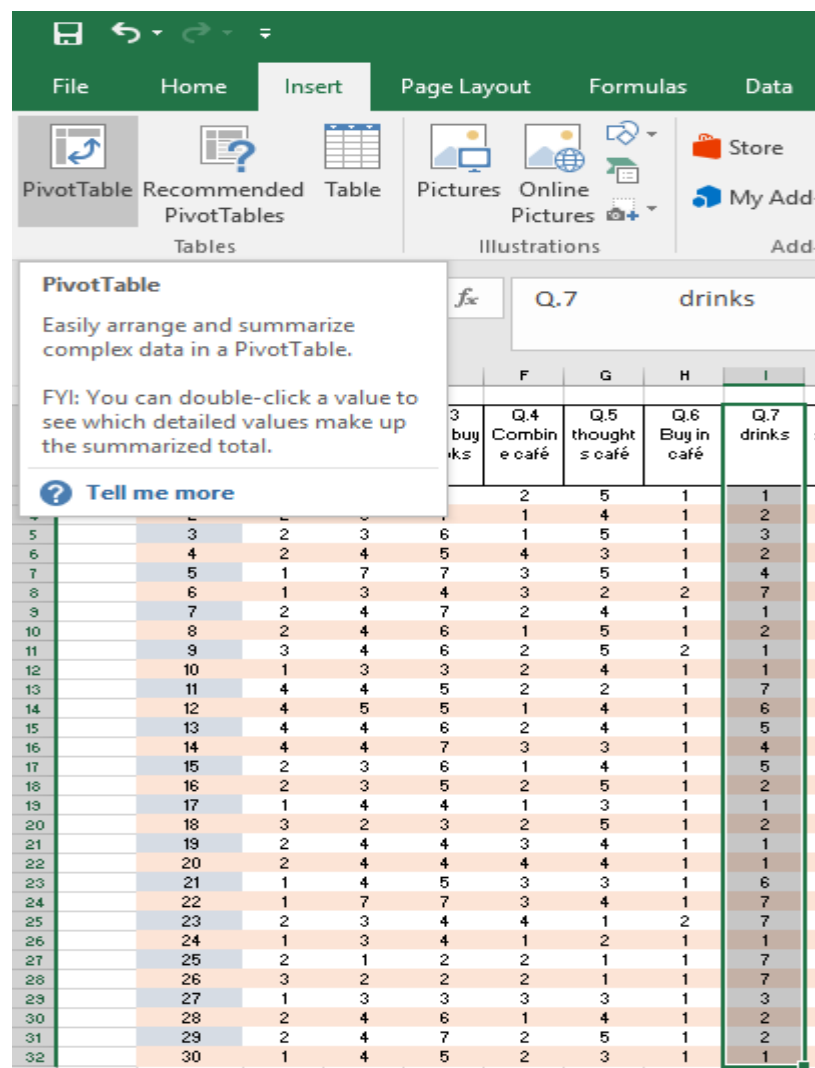
1.1 Using a PivotTable

One way to do this in Excel® is to use the pivot table command: this summarizes data in your spreadsheet.

First of all, drag your cursor over the heading for Q7 and highlight it and all 30 values within the column below.

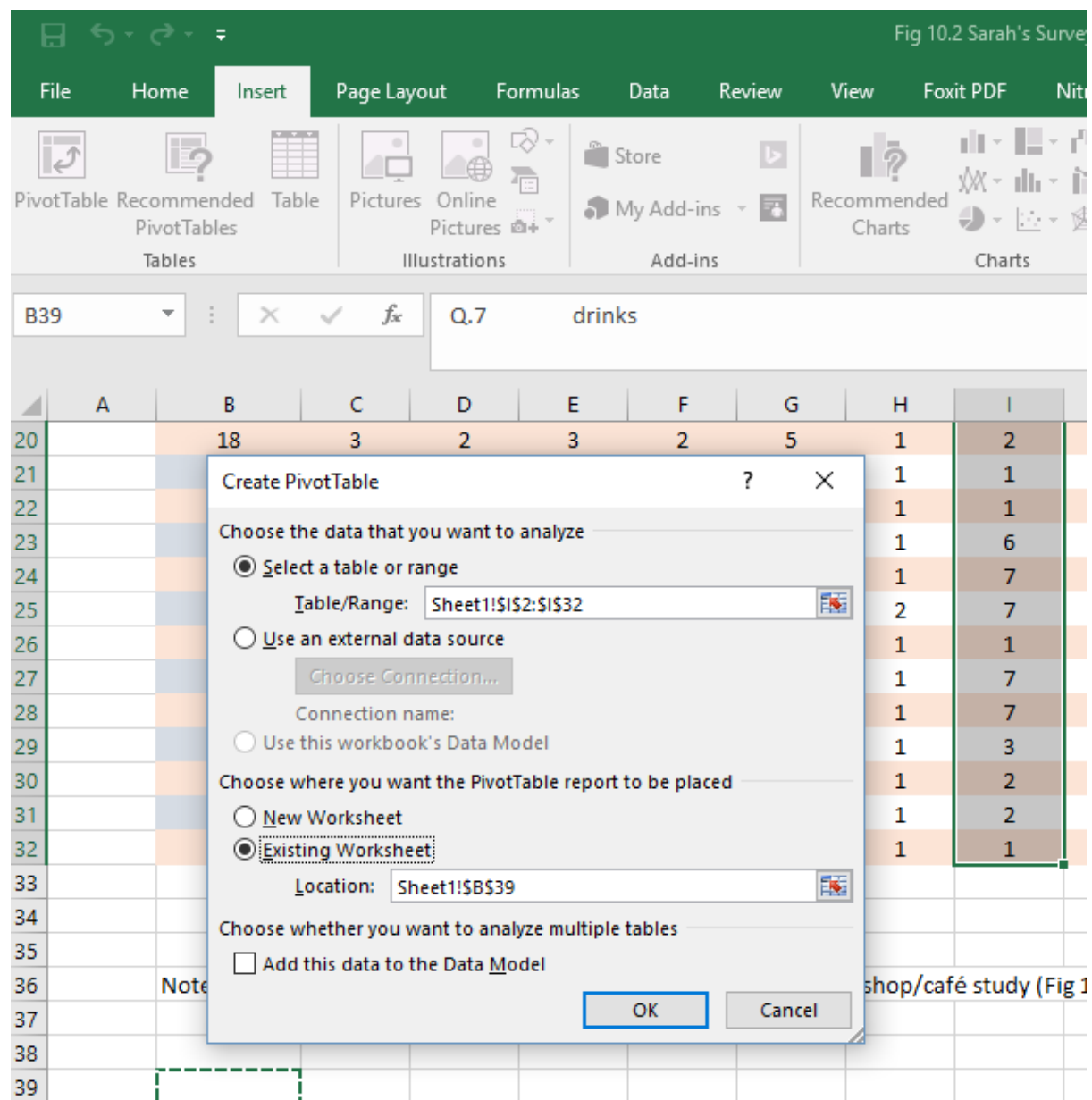
Next Press **Insert** at the top of your Excel® page

You should see **PivotTable** appear top left of your screen - you should see the screen below:



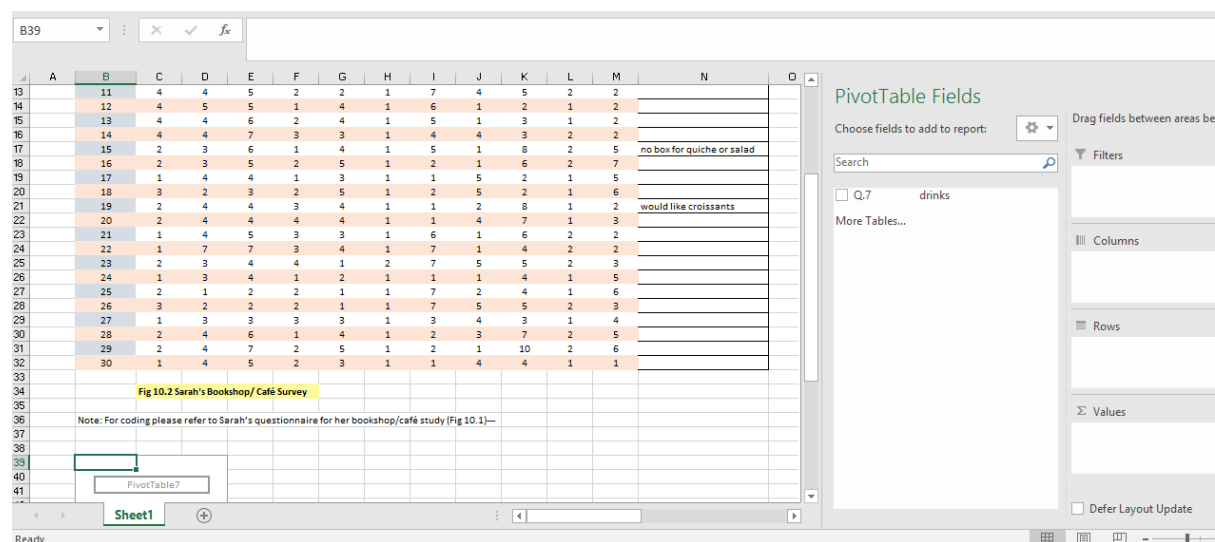
Left click on 'PivotTable'. A box entitled **Create a PivotTable** appears.

If you want to create your table on the present worksheet, click on the button 'existing worksheet' and then move your cursor to where you want the top left hand part of the table to appear in your spreadsheet (in my case I have chosen cell B39) and left click on it. – see screenshot below:



Now left click on **OK**

This brings up the box entitled '**Pivot Table Fields**' – see screen shot below:



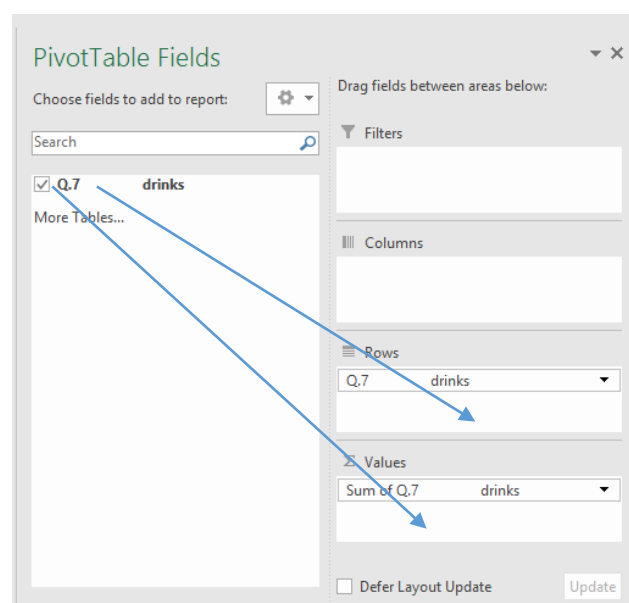
The Pivot Table shown here is only looking at one 'field' – the column labelled **Q.7**

This is the simplest table we can analyse in this way, as it only has one column. – column I

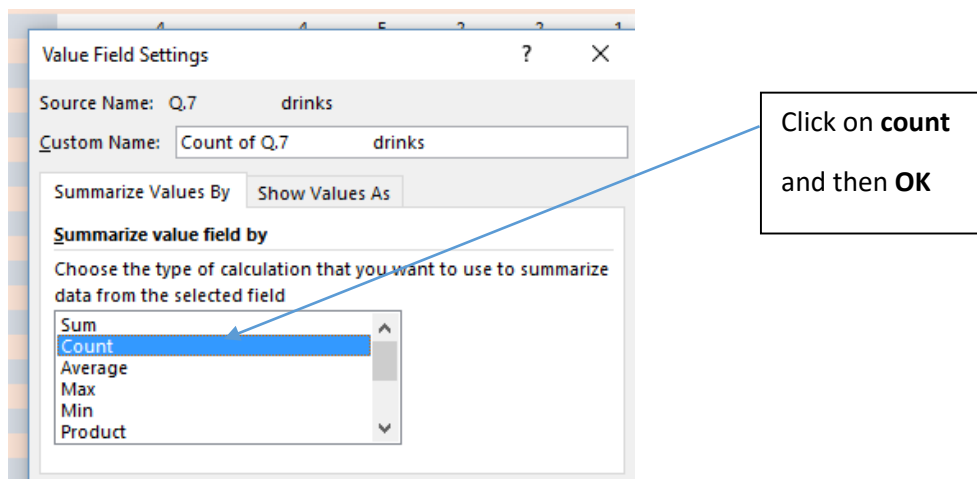
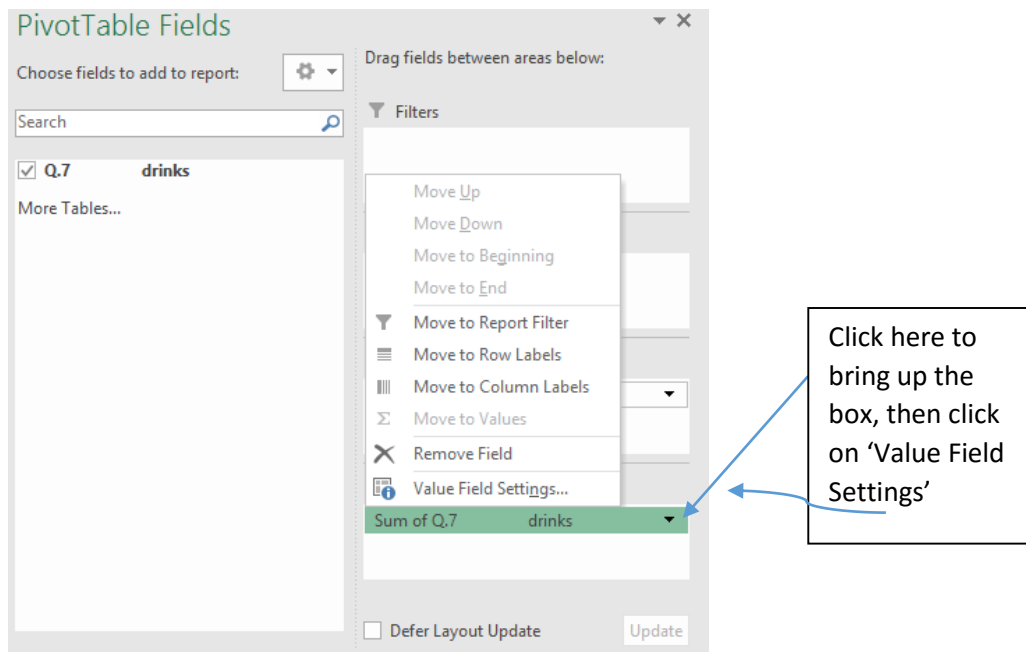
The data in the column occurs in cells I3.....I32 inclusive – ie in rows 3 to 32

To use the pivot table we **left click on Q.7** in the box - top left hand of the Pivot Table Fields table and then DRAG it down to the right to the **Rows box (To drag left click and holding your finger pressed down move your cursor to the desired position and then release your finger).** – see screenshot below.

Next left click again on **left click on Q.7** in the top left hand of the table and then DRAG it down to the right to the **box entitled Σ Values.**



The Σ is a Greek symbol used in mathematics to denote a command to sum data. The Σ Values box will ask Excel® to summarise our data in some sort of way. What we want Excel® to do for our pie chart is to **count** the number of times different drinks were selected. To do this click on the ▼ symbol as shown below and then select 'Value Field Settings'



The following table appears with top left hand cell as B39

38			
39	Row Labels	Count of Q.7	drinks
40	1	9	
41	2	7	
42	3	2	
43	4	2	
44	5	2	
45	6	2	
46	7	6	
47	Grand Total	30	
48			

Remember – these numbers are simply codes for the different types of drinks

This provides a summary of how many people chose a particular type of drink. For instance, the drink coded as **1** is coffee. The table shows us that 9 people chose this.

We could use the table as it is but it needs some tidying up first.

One way to do this is to highlight the data and copy and paste it to another location in Excel® – then we can make some changes more easily. For instance, it makes sense to replace the codes 1 – 7 with proper labels, as shown below:

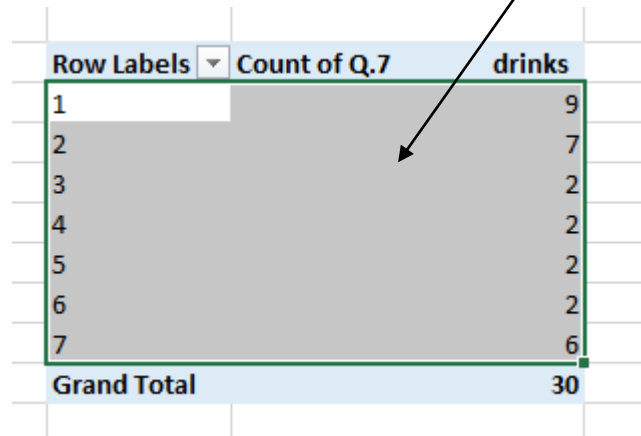
Row Labels	Count of Q.7	drinks
1	9	coffee
2	7	tea
3	2	fruit juice
4	2	bottled water
5	2	hot chocolate
6	2	smoothie
7	6	none of the above
Grand Total	30	

Copy and paste – and change number codes to labels

Not sure how to copy and paste to do this? See instructions below:

COPY AND PAST INSTRUCTIONS

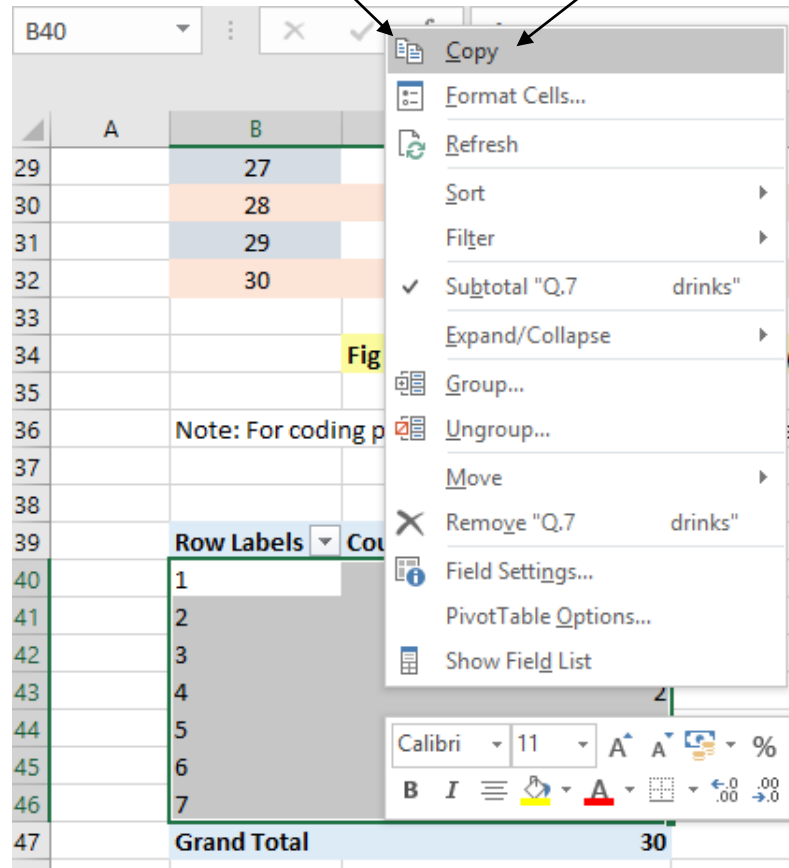
1. Left click , keep finger down and drag cursor over all rows to highlight all data. Release your finger.



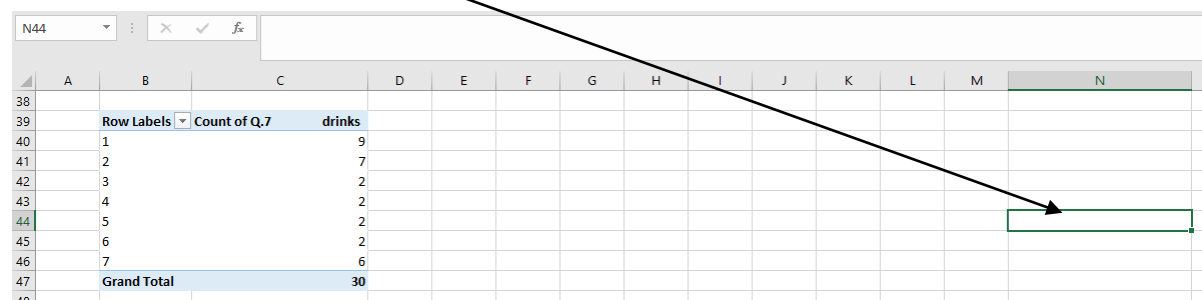
Row Labels	Count of Q.7	drinks
1		9
2		7
3		2
4		2
5		2
6		2
7		6
Grand Total		30

2. With your cursor within the shaded data area, right click your cursor. This brings up this menu.

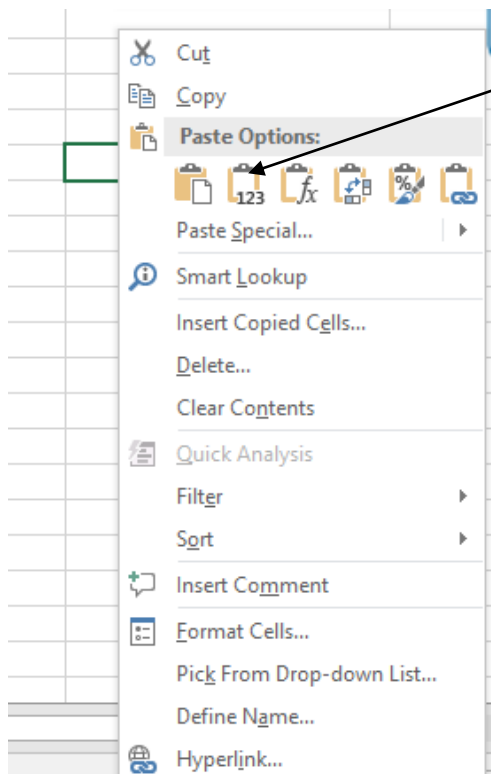
3. Now left click on 'copy'



4. Now move your cursor to where you want the top left hand cell of your new table to be – here I have chosen cell N44



5. Right click within N44 and you get this screen – click on Paste Options 123 (values)



You now have the values in cells N44:O50

Replace the left hand column with the category names – ie Coffee for 1, Tea for 2 etc

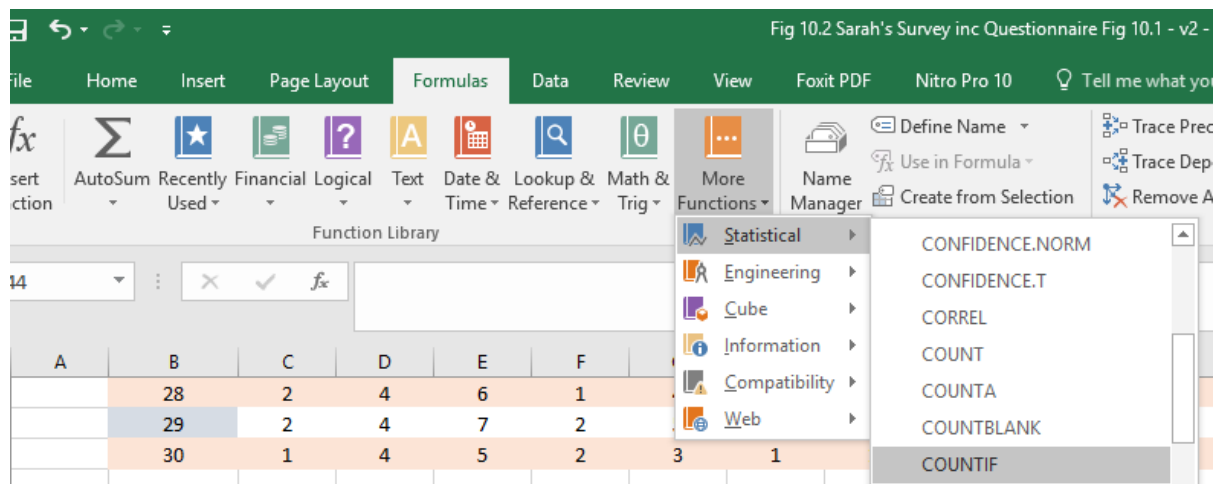
Put a border aournd your table

Centre data in cells if you wish using this

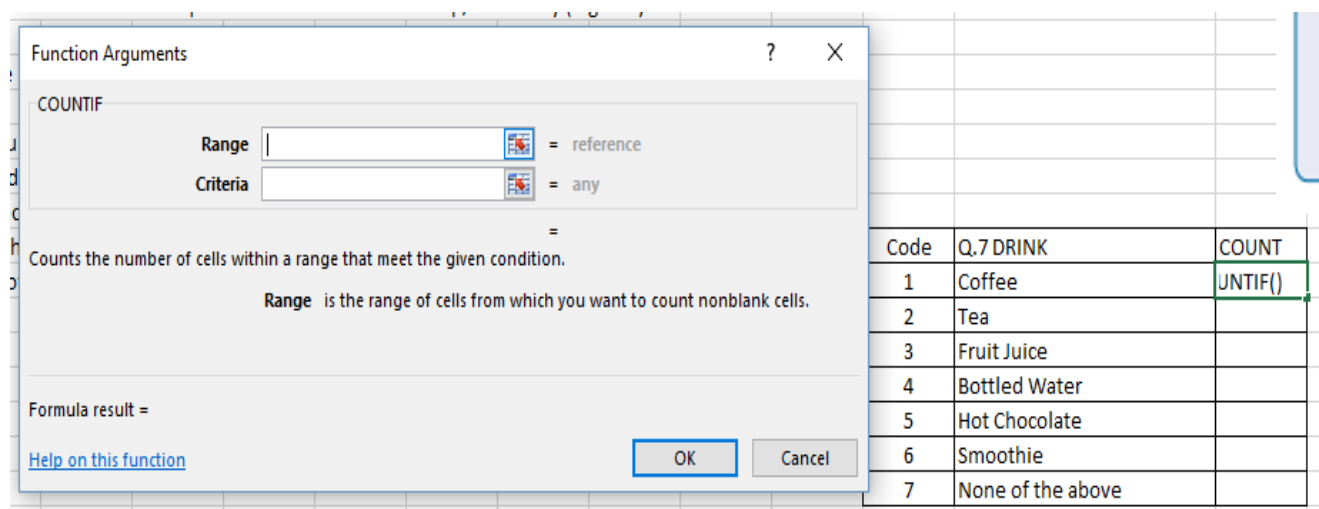
Add headings by typing - etc

The screenshot shows the Microsoft Excel interface with the 'Home' tab selected. The ribbon includes 'File', 'Home', 'Insert', 'Page Layout', 'Formulas', 'Data', and 'Review'. The 'Font' group on the 'Home' ribbon is visible, showing options for Cut, Copy, Paste, Format Painter, Clipboard, Font (Calibri, 11), Bold (B), Italic (I), Underline (U), and a border icon. The 'Alignment' group shows text alignment options (left, center, right, justified) and text orientation options. The formula bar shows 'N44' and the value '1'. The worksheet grid shows columns M, N, O, P, and Q, and rows 42 to 51. A table is highlighted in columns N, O, P, and Q, rows 44 to 50. The table contains numerical data. Arrows from the instructions above point to specific parts of the interface: a red arrow points to the formula bar, a purple arrow points to cell N44, an orange arrow points to the border icon in the Font group, and a green arrow points to the alignment icons in the Font group.

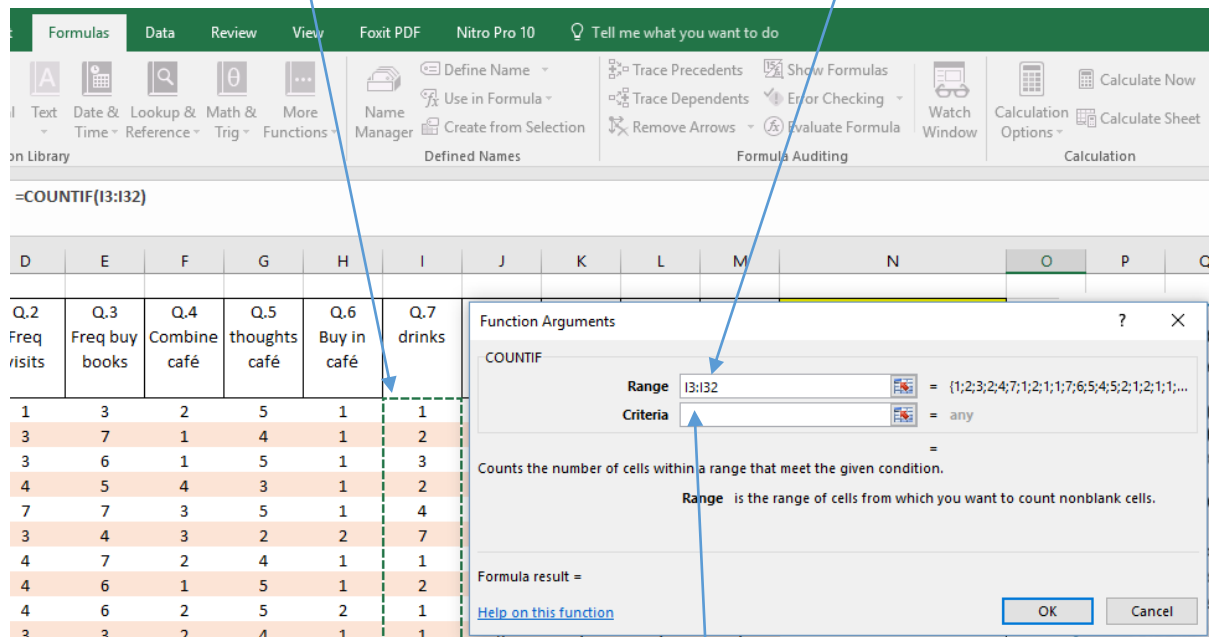
	M	N	O	P	Q
42					
43					
44		1	9		
45		2	7		
46		3	2		
47		4	2		
48		5	2		
49		6	2		
50		7	6		
51					



Click on COUNTIF and you will get the following screen:



Excel® will look in the **Range** of cells you tell it to. In our case we want to look at the Question 7 column data. Use your cursor to highlight column 7 data – as shown below – cells I 3 to I 32 - you will see these appear in the 'Range' inside your COUNTIF box



For 'coffee' we note that the code is '1'. So we will enter '1' into the criteria box.

Excel® will now look through the range – ie column for Q. 7 and every time it sees a '1' it will add it to its count of occurrences

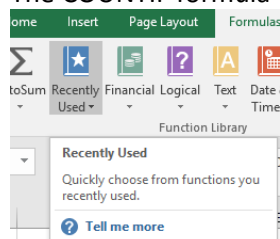
We then press 'OK'. We will see that there are 9 occurrences of the coffee choice (1) – this appears in cell O44 in our table. You will see the formula for the cell here.

The screenshot shows the Excel spreadsheet with the formula =COUNTIF(I3:I32,1) in cell O44. The table below shows the results of the COUNTIF function for each drink category.

Code	Q7. Drink	Count
1	Coffee	9
2	Tea	
3	Fruit Juice	
4	Bottled Water	
5	Hot Chocolate	
6	Smoothie	
7	None of the above	

Now place your cursor on the Tea 'count' cell O45 and repeat the COUNTIF process outlined above, but this time enter the number '2' as your criteria. Note:

The COUNTIF formula will be available under the 'Recently Used' icon if you want to speed things up a bit.



Then repeat for all of the other categories. You should then get the table below:

STEP 2

Creating your Pie Chart from your summary table

2.1 Using the pie chart icon

Firstly, use your cursor to highlight your summary table data in your Excel® spreadsheet. Make sure to include the column labels. Follow instructions on the screenshot below:

1. Highlight your table with your cursor

2. Click **Insert** and then then **Pie Chart** symbol

3. Select 2-D Pie

4. You will see this pie chart appear

The screenshot shows the Excel interface with the 'Insert' tab selected. The 'Pie Chart' icon is highlighted in the 'Charts' group. A 2-D Pie chart is displayed on the right side of the screen. A data table is highlighted in the spreadsheet, showing the following data:

Code	Q7. Drink	Count
1	Coffee	9
2	Tea	7
3	Fruit Juice	2
4	Bottled Water	2
5	Hot Chocolate	2
6	Smoothie	2
7	None of the above	6
	Check Sum	30

The pie chart displays the following data series:

- Coffee (9)
- Tea (7)
- Fruit Juice (2)
- Bottled Water (2)
- Hot Chocolate (2)
- Smoothie (2)
- None of the above (6)

Use this chart type to:

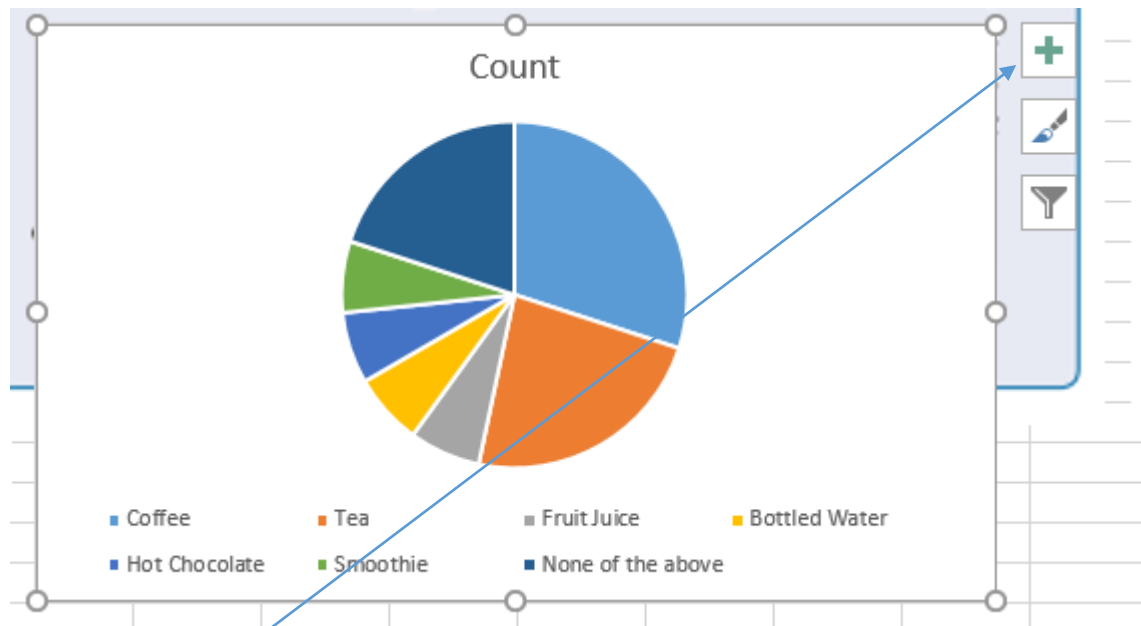
- Show proportions of a whole.

Use it when:

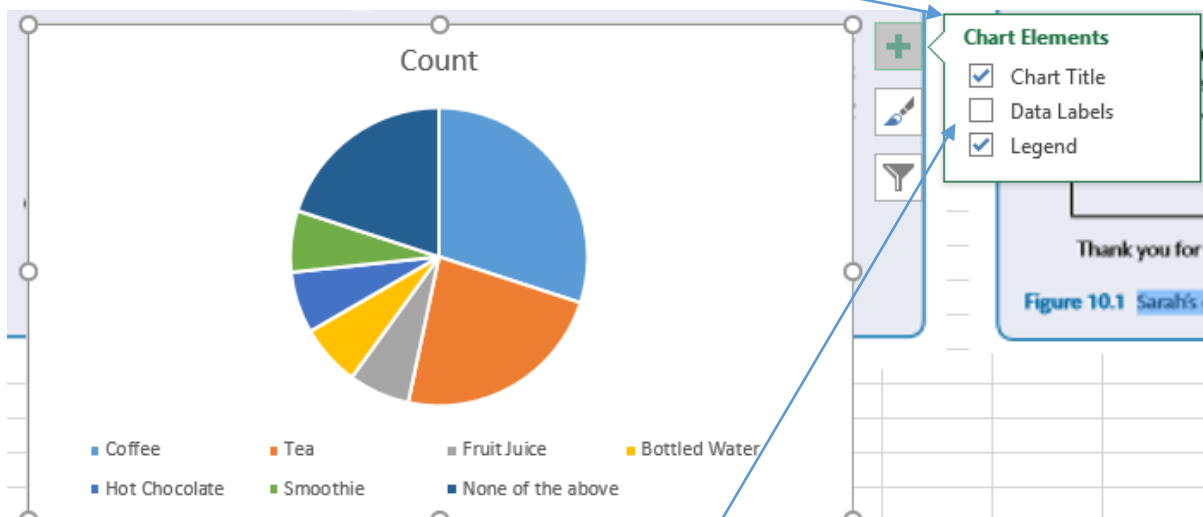
- Numbers equal 100%.
- The chart contains only a few pie slices (many slices make the angles hard to estimate).

More Pie Charts...

However, we would like to see more details – for instance the number of types of drinks. We might also want to make changes to the other labels on the chart. To make changes click on the chart box. You will see 3 icons appear which you can use to make changes – see below:

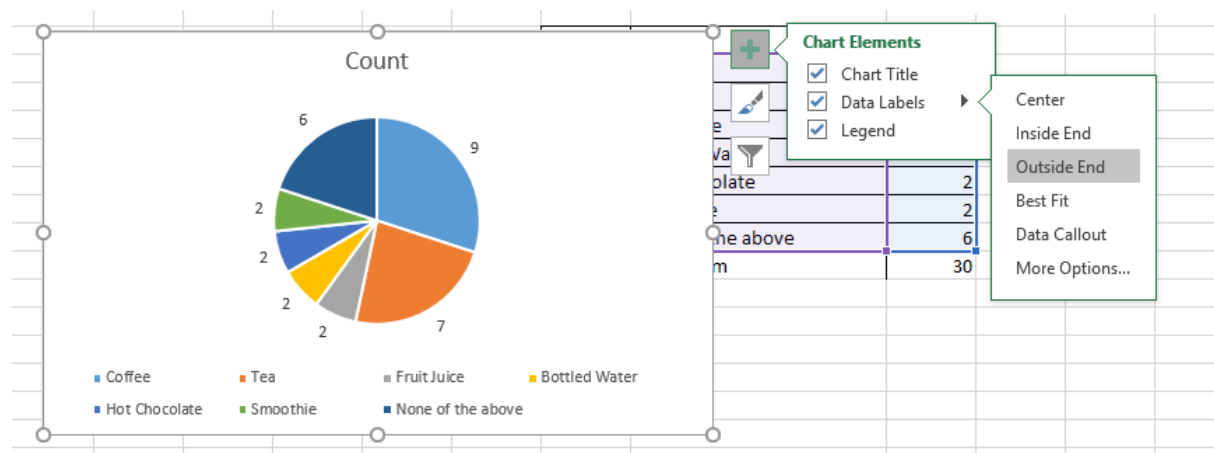


Click on the **+** icon and you will see the following call out box

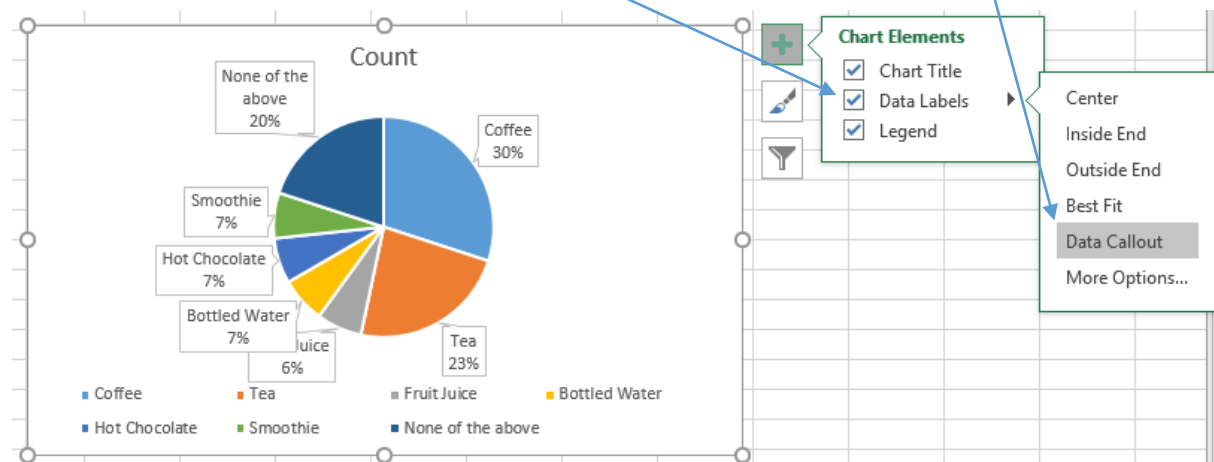


To enter the counts of each drink click on 'data labels'

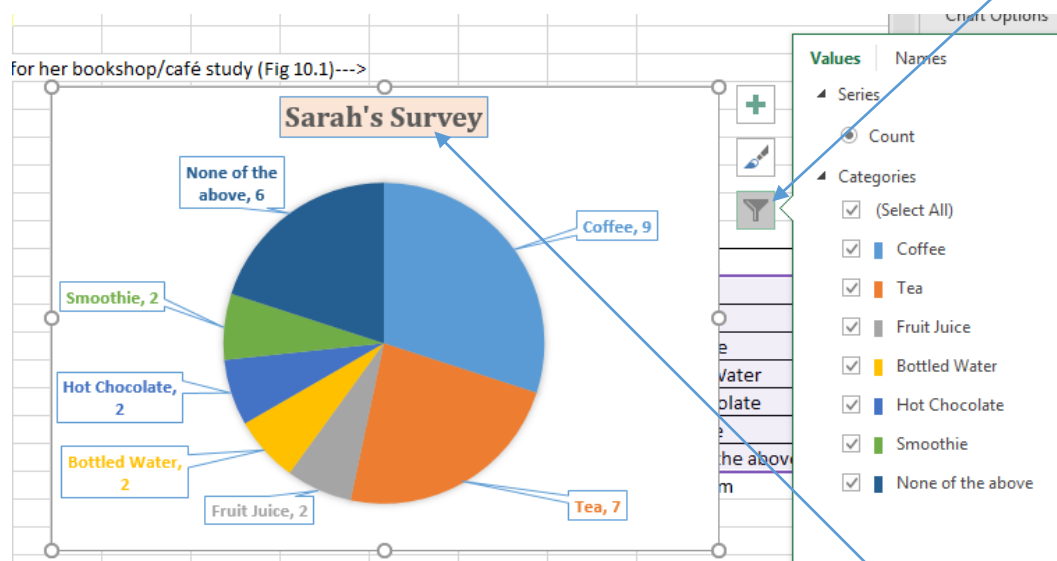
For instance you might use the following – try other options for yourself



To enter call out data labels click here for data labels and then select 'Data callout' (Excel® 2016)



You should now play around with the commands to see what happens – for instance here we can reduce the categories shown on the chart



And here you can replace 'Count' by your own text by clicking in with your cursor

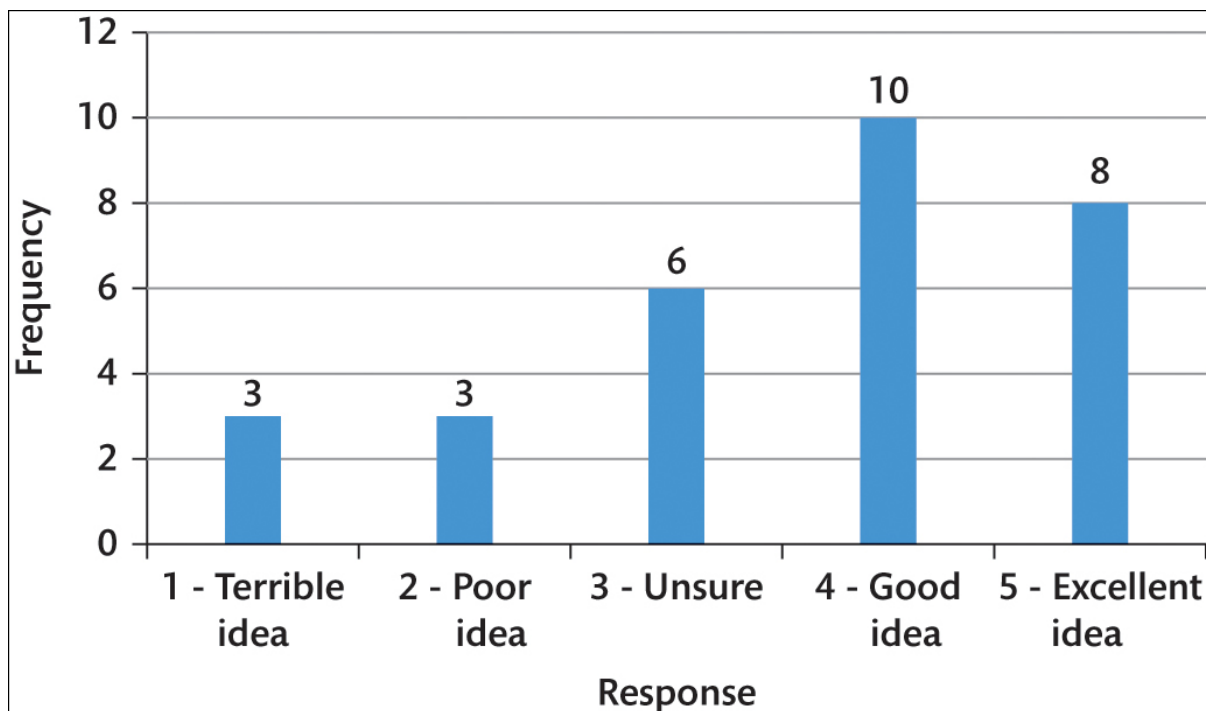
STEP 3

Creating a Bar chart from your summary table

For this example, we are going to recreate the bar chart shown in the text as Fig 10.12 and which represents findings from Question 5 (“Is a café a good idea?”) in Sarah’s survey.

This bar chart has 5 bars (categories – Ordinal data) which form a Likert Scale (See textbook, sec. 10.4.3)

Here it is shown to remind you:



Again we have to create a summary chart from our Excel® data before we can proceed to draw the above bar chart in Excel®. Refer to either the accompanying ORC tutorial on how to use a Pivot Table or the COUNTIF function to create your summary chart.

Your summary chart should look like this – copy and paste to arrive at the table on the right hand side:

Row Labels ▼ Count of Q.5 thoughts café		Thoughts on café	Count
1	3	Terrible idea	3
2	3	Poor idea	3
3	6	Unsure	6
4	10	Good idea	10
5	8	Excellent idea	8
Grand Total			
	30		

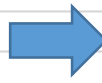


Fig 10.2 Sarah's Bookshop/ Café Survey

For coding please refer to Sarah's questionnaire for her bookshop/café

Labels	Count of Q.5 thoughts café
	3
	3
	6
	10
	8
Grand Total	30

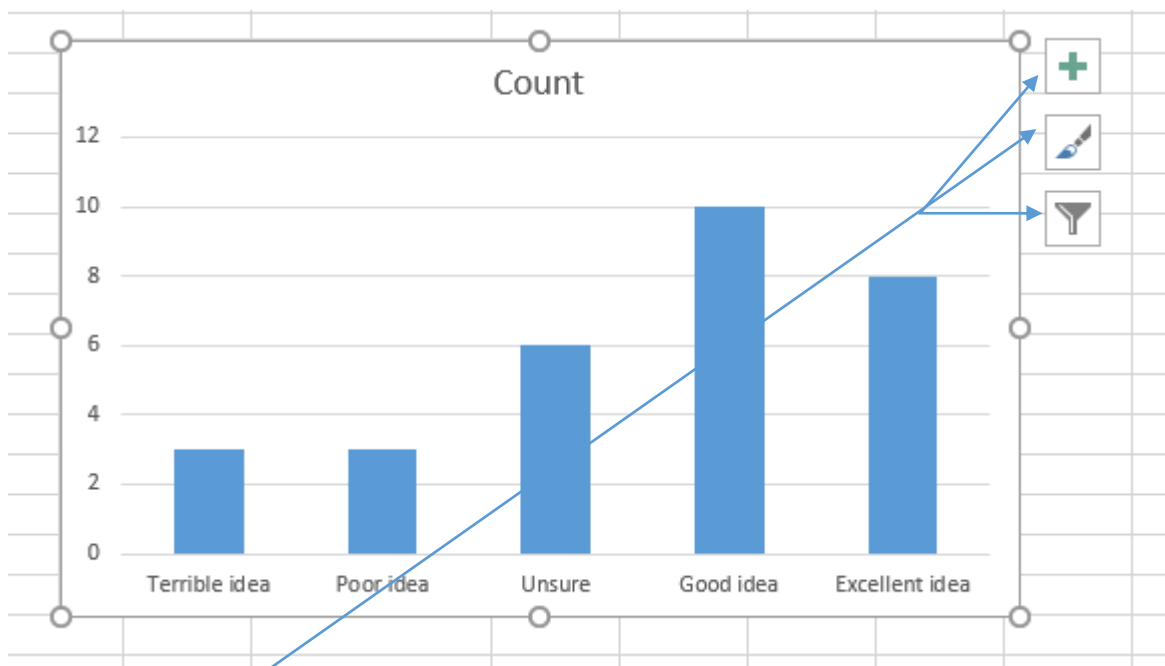
Thoughts on café	Count
Terrible idea	3
Poor idea	3
Unsure	6
Good idea	10
Excellent idea	8

Step 1. Highlight this area with your cursor

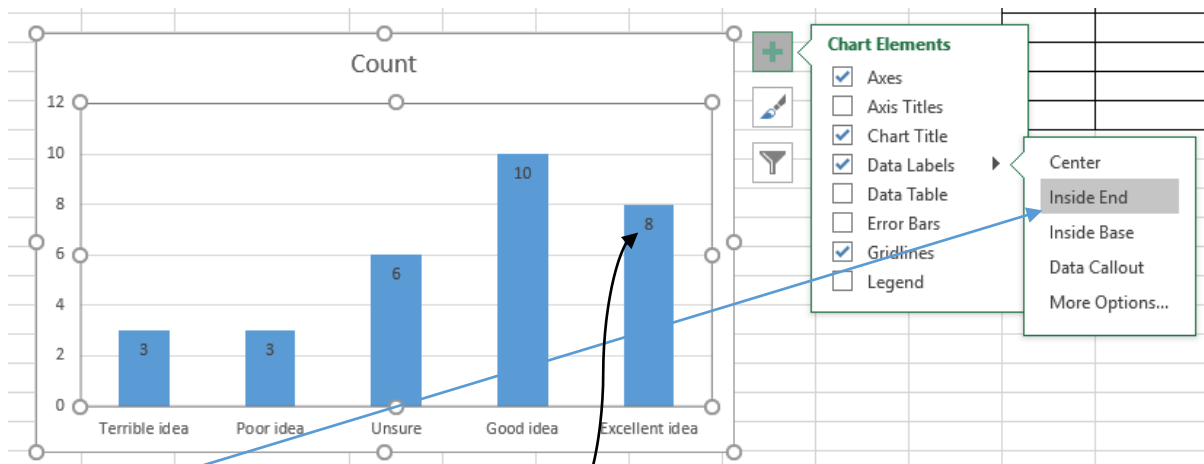
Step 2. Click on 'Insert'

Step 3: Click on bar chart symbol and ▼

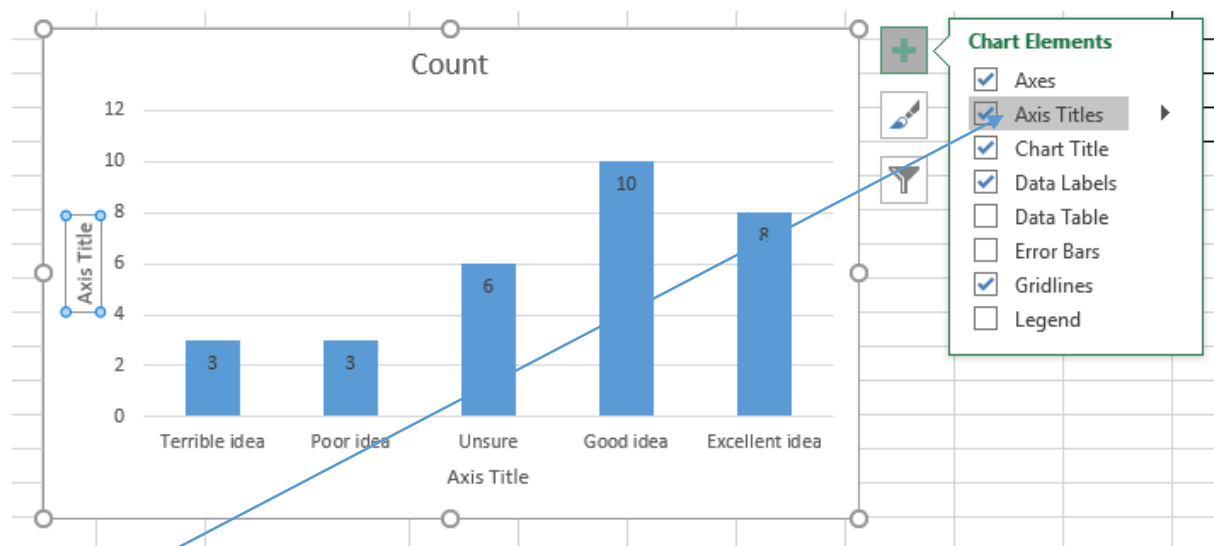
Select the 2-D option. This will give you the chart below:



Click on these icons to alter your chart

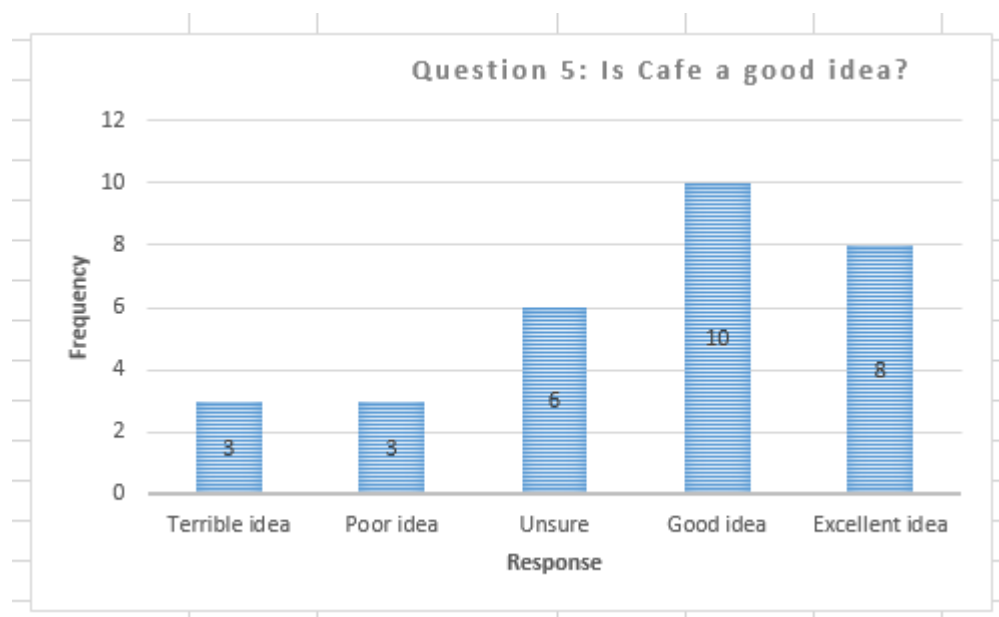


Click here to add these counts within the bars



Click here to change axis titles – type into axis boxes.

Experiment. The chart below has clear title, axes, and data labels. There are quite a variety of other of formats which would also meet these requirements.



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