

How to Easily Create a Percent Frequency Distribution Chart in Excel

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December 3, 2025

RECOMMENDED CITATION

stats writer (2025). *How to Easily Create a Percent Frequency Distribution Chart in Excel*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=104585>

The ability to analyze data effectively is crucial in fields ranging from business intelligence to academic research. One fundamental statistical tool for summarizing categorical data is the percent frequency distribution. This powerful mechanism transforms raw counts into easily digestible percentages, allowing stakeholders to understand the proportion of the whole represented by each category. This comprehensive guide, tailored for users of Excel, provides a detailed, step-by-step methodology for constructing a valid and insightful percent frequency distribution, ensuring clarity and accuracy in your data presentation.

A **percent frequency distribution** is essential for understanding what percentage of a distribution is composed of specific values or categories, providing a clear view of the relative contribution of each data point group.

The following structured, step-by-step example shows precisely how to create a robust percent frequency distribution table using powerful functions within Excel.

Step 1: Preparing and Entering the Dataset

The foundational step in any statistical analysis is the preparation and entry of the raw data. For this demonstration, we will create a structured dataset comprising information related to 20 different basketball players. This data is categorical, identifying which team each player belongs to, which is the perfect use case for a percent frequency distribution.

Ensure that your data is entered into a single, contiguous column in the Excel sheet. Data integrity is crucial here; minor variations in spelling or capitalization will cause the subsequent counting functions to treat identical categories as separate entries, leading to an inaccurate frequency calculation. We will assume the data starts in cell B2.

By laying out the data clearly, as shown below, we establish the population of 20 observations that will be analyzed to determine the percentage makeup of each team category. This initial setup is the backbone for the entire distribution process.

	A	B	C	D	E	F	G
1	Team	Points					
2	A	12					
3	A	19					
4	B	28					
5	A	21					
6	A	23					
7	B	15					
8	B	7					
9	C	12					
10	A	19					
11	D	11					
12	A	10					
13	B	6					
14	D	14					
15	C	22					
16	C	32					
17	D	35					
18	D	19					
19	A	14					
20	B	20					
21	D	22					
22							
23							
24							
25							

Step 2: Identifying Unique Teams using UNIQUE()

After the raw data is entered, the next step involves extracting the distinct, unique categories present in the dataset. Manually identifying unique values can be cumbersome, especially with large datasets. Modern versions of Excel (Excel 365) offer the dynamic array function, UNIQUE(), which streamlines this process dramatically.

To use this function, select a cell where you want the list of unique categories to begin (for instance, E2). Then, input the formula, referencing the entire range of your raw data:

=UNIQUE(B2:B21)

Upon pressing Enter, the UNIQUE() function automatically spills the list of distinct team labels (Teams A, B, C, and D) into the cells below E2. These derived categories are crucial because they define the groups for which we must calculate the raw and relative frequencies.

If you are using an older version of Excel that does not support the dynamic array capabilities of UNIQUE(), you must manually copy the data column to a new location and use the 'Remove Duplicates' feature found under the Data tab to create this list of distinct team values.

Step 3: Calculating Raw Frequencies using COUNTIF()

With the unique categories defined, the subsequent step is to quantify the occurrence of each team--calculating the raw frequency. The COUNTIF() function in Excel is specifically designed for this purpose, allowing you to count cells within a range that meet a specified criterion.

In the cell adjacent to the first unique team (F2), we will enter the COUNTIF() formula. It requires the range of the original data (B2:B21) and the specific criterion (E2, the team name) to count:

=COUNTIF(\$B\$2:\$B\$21, E2)

It is imperative to use **absolute references** (indicated by the dollar signs, \$) for the data range (\$B\$2:\$B\$21). This ensures that when the formula is copied down to calculate the frequencies for Teams B, C, and D, the range remains fixed on the source data, while the criterion (E2) adjusts relative to the new row. Drag the fill handle from F2 down to F5 to complete the raw frequency counts for all unique teams.

E2					=COUNTIF(\$A\$2:\$A\$21, D2)		
	A	B	C	D	E	F	G
1	Team	Points		Teams			
2	A	12		A	7		
3	A	19		B	5		
4	B	28		C	3		
5	A	21		D	5		
6	A	23					
7	B	15					
8	B	7					
9	C	12					
10	A	19					
11	D	11					
12	A	10					
13	B	6					
14	D	14					
15	C	22					
16	C	32					
17	D	35					
18	D	19					
19	A	14					
20	B	20					
21	D	22					
22							
23							

Step 4: Converting Frequencies to Relative Proportions

The raw counts obtained in Step 3 must now be converted into relative frequencies, which are the foundational component of the percent frequency distribution. Relative frequency is calculated by dividing the raw frequency of a specific category by the total number of observations in the dataset.

First, calculate the total sum of all raw frequencies (e.g., using the `SUM()` function in cell F6, resulting in 20). Then, in the cell where you want the relative frequency to appear (G2), enter the division formula:

=F2/\$F\$6

Similar to the previous step, the denominator (the total count in F6) must be locked using **absolute referencing** (\$F\$6). This guarantees that every individual frequency (F2, F3, etc.) is accurately compared against the same total population size. Apply this formula across all categories by dragging the fill handle down. The results in column G will be decimal representations of the

relative proportions (e.g., 0.35).

	A	B	C	D	E	F	G
1	Team	Points		Teams			
2	A	12		A	7	0.35	
3	A	19		B	5	0.25	
4	B	28		C	3	0.15	
5	A	21		D	5	0.25	
6	A	23					
7	B	15					
8	B	7					
9	C	12					
10	A	19					
11	D	11					
12	A	10					
13	B	6					
14	D	14					
15	C	22					
16	C	32					
17	D	35					
18	D	19					
19	A	14					
20	B	20					
21	D	22					
22							

Step 5: Applying Percentage Formatting in Excel

Although the decimal values in column G are mathematically correct, they are typically less impactful and harder to interpret than standard percentages. The final visual step in generating the distribution is applying the appropriate percentage formatting in Excel.

To achieve this, highlight the entire range of relative frequency decimal values (G2 through G5). Navigate to the **Home** tab on the Excel ribbon. Within the **Number** group, locate and click the **Percentage Style** (%). This action automatically multiplies the decimal value by 100 and displays it with the percent symbol, transforming 0.35 into 35%.

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=E2/SUM(\$E\$2:\$E\$5)

C	D	E	F	G	H	I	J	K	L
	Teams								
	A	7	0.35						
	B	5	0.25						
	C	3	0.15						
	D	5	0.25						

Step 6: Analyzing the Final Percent Frequency Distribution

The completed table now presents the definitive percent frequency distribution for the basketball team data. This final output is highly readable and directly interpretable, making it excellent for reporting and executive summaries.

A fundamental check for statistical validity is ensuring that the sum of all percentages in the distribution totals 100%. This acts as confirmation that all observations were correctly counted and that the division by the total population was executed accurately. If the sum deviates, revisit the calculations in Steps 3 and 4, particularly the absolute referencing of the total count.

The success of this comprehensive method is confirmed by the resulting table:

C	D	E	F	G
	Teams			
	A	7	35%	
	B	5	25%	
	C	3	15%	
	D	5	25%	

The distribution clearly reveals the relative strength of each team within the 20-player sample:

35% of all players belong to team A

25% of all players belong to team B

15% of all players belong to team C

25% of all players belong to team D

Note that the percentages, when summed, precisely add up to 100%, indicating a flawless frequency calculation.

Additional Resources for Advanced Frequency Calculations

While this tutorial focused on categorical data using `COUNTIF()`, creating frequency distributions for continuous data (data measured on a scale, such as sales figures or temperatures) requires the use of bin arrays and the dedicated `FREQUENCY()` function in Excel. Understanding these functions is vital for comprehensive data analysis.

The following resources offer additional information on how to calculate frequencies in Excel for various data types and statistical requirements: