

# How to Calculate Averages in Excel: Understand AVERAGE vs. AVERAGEA

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## An Introduction to Statistical Analysis in Microsoft Excel

In the realm of data manipulation and quantitative analysis, **Microsoft Excel** stands as an industry-standard tool, providing a vast library of functions designed to simplify complex mathematical operations. Among the most frequently utilized features are those centered on descriptive statistics, specifically the calculation of the **Arithmetic Mean**. Users often find themselves deciding between the **AVERAGE** and **AVERAGEA** functions when attempting to summarize a dataset. While these functions share a common goal--determining the central tendency of a group of values--they operate under fundamentally different logic regarding how they interpret various **Data Types** within a **Worksheet**.

Understanding the nuances between these two functions is critical for ensuring data integrity and accuracy in reporting. If a professional uses the wrong function, they risk misrepresenting their findings, leading to flawed business decisions based on skewed averages. The **AVERAGE** function is designed to be selective, focusing purely on numerical entries, whereas **AVERAGEA** is more inclusive, processing every cell within a specified range regardless of its content. This distinction becomes particularly important when dealing with "dirty" data that might contain text strings, logical values, or empty spaces that could unintentionally impact the final output.

In this comprehensive guide, we will explore the underlying mechanics of both the **AVERAGE** and **AVERAGEA** functions. We will examine how **Microsoft Excel** treats different inputs, walk through practical examples involving player statistics, and provide a clear framework for deciding which tool is appropriate for your specific analytical needs. By the end of this article, you will possess a deeper understanding of spreadsheet **Syntax** and the confidence to apply these statistical functions to complex, real-world datasets without compromising the precision of your results.

### Excel: Difference Between AVERAGE and AVERAGEA Functions

The **AVERAGE** and **AVERAGEA** functions in **Microsoft Excel** both calculate the **Arithmetic Mean** in a range, but they do so slightly differently:

The **AVERAGE** function calculates the mean of all *numbers* in a column.

The **AVERAGEA** function calculates the mean of all *values* in a column.

This function calculates **TRUE** and **FALSE** values to be **1** and **0**, respectively.

This function calculates all text values to be equal to **0**.

The following example shows how to use each function in practice with the following dataset in **Microsoft Excel** that contains information about various basketball players:

	A	B	C	D	E	F
1	<b>Team</b>	<b>Points</b>	<b>All-Star?</b>			
2	Mavs	15	TRUE			
3	Spurs	16	FALSE			
4	Rockets	14	FALSE			
5	Kings	12	FALSE			
6	Warriors	fifteen	TRUE			
7	Nets	10	FALSE			
8	Lakers	29	TRUE			
9						
10						
11						
12						
13						
14						
15						
16						
17						

### Example 1: AVERAGE vs. AVERAGEA Functions with Text Values

We can type the following **Excel Formula** into cells **E2** and **F2** to use the **AVERAGE** and **AVERAGEA** functions to calculate the mean value in the **Points** column:

**E2:** =AVERAGE(B2:B8)

**F2:** =AVERAGEA(B2:B8)

The following screenshot shows how to use each function in practice:

	A	B	C	D	E	F
1	<b>Team</b>	<b>Points</b>	<b>All-Star?</b>		<b>AVERAGE Points</b>	<b>AVERAGEA Points</b>
2	Mavs	15	TRUE		16	13.71428571
3	Spurs	16	FALSE			
4	Rockets	14	FALSE			
5	Kings	12	FALSE			
6	Warriors	fifteen	TRUE			
7	Nets	10	FALSE			
8	Lakers	29	TRUE			
9						
10						
11						
12						
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14						

The **AVERAGE** function uses only the numeric values in the column to calculate the **Arithmetic Mean**:

AVERAGE:  $(15+16+14+12+10+29) / 6 = 16$

Meanwhile, the **AVERAGEA** function uses all of the values in the column to calculate the mean, using 0 for any text values:

AVERAGEA:  $(15+16+14+12+0+10+29) / 7 = 13.71428571$

## Example 2: AVERAGE vs. AVERAGEA Functions with Boolean Values

We can type the following formulas into cells **E2** and **F2** to use the **AVERAGE** and **AVERAGEA** functions to calculate the mean value in the **All-Star** column:

**E2:** =AVERAGE(C2:C8)

**F2:** =AVERAGEA(C2:C8)

The following screenshot shows how to use each function in practice:

	A	B	C	D	E	F
1	<b>Team</b>	<b>Points</b>	<b>All-Star?</b>		<b>AVERAGE All-Star</b>	<b>AVERAGEA All-Star</b>
2	Mavs	15	TRUE		#DIV/0!	0.428571429
3	Spurs	16	FALSE			
4	Rockets	14	FALSE			
5	Kings	12	FALSE			
6	Warriors	fifteen	TRUE			
7	Nets	10	FALSE			
8	Lakers	29	TRUE			
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The **AVERAGE** function returns the **#DIV/0!** error because it is not capable of calculating the average of **Boolean** (TRUE and FALSE) values.

Meanwhile, the **AVERAGEA** function counts TRUE values as 1 and FALSE values as 0, and calculates the following average:

AVERAGEA:  $(1+0+0+0+1+0+1) / 7 = \mathbf{0.42857}$

This tells us that the percentage of values in the **All-Star** column that are equal to TRUE is **42.857%**.

## Understanding the Core Mechanics of the AVERAGE Function

The **AVERAGE** function is arguably one of the most fundamental tools in **Microsoft Excel**, serving as the primary method for finding the central value of a numeric range. Its design is intentionally exclusionary; it scans a specified range and identifies only those cells that contain numeric data. Any cell containing text, logical values (like TRUE or FALSE), or even those that are entirely blank, are systematically ignored by the formula's calculation logic. This is a crucial feature for analysts who frequently work with datasets where non-numeric placeholders, such as "Pending" or "N/A," might be present. By ignoring these entries, the function ensures that the calculated mean is derived solely from the available quantitative data.

Mathematically, the **AVERAGE** function operates by summing the numeric values and dividing that sum by the count of those numeric entries. For instance, if you have a list of ten cells where eight contain numbers and two contain text, the function will only sum the eight numbers and divide by eight. This prevents the "dilution" of the mean that would occur if the non-numeric cells were counted as zeros. Because of this behavior, the **AVERAGE** function is often preferred when the presence of non-numeric data is considered "missing" or "irrelevant" to the statistical outcome of the analysis.

However, this selective nature can also lead to issues, specifically the **#DIV/0!** error. As seen in the basketball dataset examples, if the **AVERAGE** function is applied to a range that contains no numeric values at all--such as a column comprised entirely of **Boolean** values or text strings--it has nothing to calculate. Since the denominator (the count of numbers) becomes zero, the formula fails. This highlights the importance of data preparation; before using the **AVERAGE** function, one must ensure that the targeted range contains at least one cell that **Microsoft Excel** recognizes as a number.

## Exploring the Comprehensive Nature of AVERAGEA

In contrast to its more selective counterpart, the **AVERAGEA** function is built for inclusivity. The "A" in the function name stands for "All," signifying that it considers every value within the selected range during its calculation. This includes not just numbers, but also text strings and **Boolean** values. When **AVERAGEA** encounters text, it assigns that cell a value of 0. Similarly, it evaluates **Boolean** inputs based on standard **Boolean logic**, where TRUE is equivalent to 1 and FALSE is equivalent to 0. This makes **AVERAGEA** an exceptionally powerful tool for certain types of data analysis where the presence of an entry, even if non-numeric, must be accounted for in the final average.

The primary utility of **AVERAGEA** is found in scenarios where "0" and "Text" represent meaningful data points. For example, if a salesperson has a record of "No Sale" written as text in their performance log, **AVERAGEA** will treat that as a zero, effectively lowering their average performance to reflect the failed attempt. If the standard **AVERAGE** function were used instead, that "No Sale" would be ignored, potentially giving a misleadingly high representation of their performance by only averaging their successful days. Thus, **AVERAGEA** provides a more holistic view of a dataset by ensuring the denominator of the mean calculation always matches the total number of non-empty cells in the range.

Because it can process non-numeric **Data Types**, **AVERAGEA** is also the go-to function for calculating the frequency or percentage of logical states. By treating TRUE as 1 and FALSE as 0, the function essentially calculates the "success rate" of a logical test. This transition from logical values to a numeric average is a common technique in advanced **Worksheet** modeling, allowing

users to convert binary categorical data into a continuous decimal format that can be used for further statistical modeling or visualization.

## Handling Textual Data: Implications for Accuracy

The handling of text is perhaps the most significant point of divergence between these two **Microsoft Excel** functions. When an analyst is working with large datasets, it is common to encounter cells that contain notes, placeholders, or error messages. The **AVERAGE** function acts as a filter, ensuring that these textual elements do not interfere with the mathematical accuracy of the numeric mean. This is particularly useful in scientific or financial data where a "0" (representing nothing) is mathematically very different from a "Null" or "Blank" (representing missing information). By ignoring the text, **AVERAGE** preserves the purity of the numeric average.

Conversely, the **AVERAGEA** function's tendency to treat text as 0 can lead to significant skewing if the user is not careful. If a dataset contains many textual entries that were not intended to be counted as zeros, the resulting average will be much lower than expected. This is a common pitfall in data reporting. For instance, in our basketball example, treating the word "None" as a zero in the points column reduced the team average significantly. This behavior requires the user to have a high level of "data literacy," understanding exactly how their inputs will be transformed by the function's internal **Syntax**.

To maintain accuracy, it is essential to perform **Data Cleaning** before choosing your function. If the text in your cells represents a value of zero, **AVERAGEA** is your ally. However, if the text is merely descriptive or represents a missing data point that should not penalize the overall average, the standard **AVERAGE** function is the scientifically correct choice. Mastering this distinction allows for more nuanced data storytelling, where the analyst can choose to either emphasize the performance of active entries or provide a weighted average that includes the impact of non-numeric placeholders.

## Deep Dive into Logical Values and Boolean Calculations

The way **Microsoft Excel** handles **Boolean** data types is a sophisticated aspect of its calculation engine. In many programming and data science contexts, logical values are treated as binary integers, and **AVERAGEA** brings this capability to the spreadsheet environment. By explicitly assigning a value of 1 to TRUE and 0 to FALSE, **AVERAGEA** bridges the gap between qualitative logic and quantitative math. This is invaluable for tracking "pass/fail" rates, "yes/no" responses, or any other binary metric where the goal is to determine the proportion of positive outcomes within a total population.

As demonstrated in the second example of our basketball dataset, the **AVERAGE** function is unable to process these logical values directly. When it encounters a range consisting solely of

TRUE and FALSE, it results in a **#DIV/0!** error. This happens because the function is searching for numeric **Data Types** and finding none, leaving it with a sum of zero and a count of zero. This error can be frustrating for beginners, but it serves as a guardrail, preventing users from accidentally calculating a mean on data that they might not realize is formatted as logical rather than numeric.

Utilizing **AVERAGEA** for **Boolean** analysis provides a streamlined way to generate percentages without needing complex IF statements or COUNTIF formulas. If you have a column indicating whether players reached their "All-Star" status, the **AVERAGEA** result of 0.42857 immediately tells you that 42.8% of the players met the criteria. This efficiency is why **AVERAGEA** is often found in the toolkits of power users who need to perform rapid data summaries across various types of logical flags and status indicators.

## Best Practices for Data Integrity and Function Selection

Selecting the correct function is only one part of the equation; maintaining overall data integrity requires a strategic approach to spreadsheet design. One of the best practices is to consistently use the same **Data Type** within a single column. Mixing numbers, text, and logical values in one range can lead to confusion, even if you understand the differences between **AVERAGE** and **AVERAGEA**. By keeping your data clean and uniform, you reduce the risk of accidental errors and make your **Worksheet** much easier for others to audit and understand.

When in doubt, it is often helpful to use auxiliary functions to verify your data before calculating an average. Functions like ISNUMBER or ISTEXT can help you identify exactly what is in your range. Furthermore, understanding the impact of empty cells is vital; both **AVERAGE** and **AVERAGEA** ignore truly empty cells. However, they both treat a cell containing a formula that returns an empty string ("") as a value. In the case of **AVERAGEA**, that empty string is treated as text (a value of 0), which can lead to unexpected results in your **Arithmetic Mean**.

Finally, always consider the "story" the data is intended to tell. If you are reporting on the average test score of students who took an exam, use **AVERAGE** to ignore those who were absent. If you are reporting on the average score of the entire class, where an absence is considered a failing grade (0), then **AVERAGEA** is the more honest representation of the group's performance. By aligning your choice of function with your analytical objectives, you ensure that your **Microsoft Excel** reports are both technically accurate and contextually relevant.