VLOOKUP function

⊞ Show All

This article describes the formula syntax and usage of the **VLOOKUP** function in Microsoft Excel.

Description

You can use the **VLOOKUP** function to search the first column of a range of cells, and then return a value from any cell on the same row of the range. For example, suppose that you have a list of employees contained in the range A2:C10. The employees' ID numbers are stored in the first column of the range, as shown in the following illustration.

	A	B	C
1	**Employee ID**	**Department**	**Full Name**
2	35	Sales	Yossi Banai
3	36	Production	Nicole Bousseau
4	37	Sales	Aik Chen
5	38	Operations	Axel Delgado
6	39	Sales	Suroor Fatima
7	40	Production	Gerhard Goeschl
8	41	Sales	Andreas Hauser
9	42	Operations	Nattorn Jayanama
10	43	Production	Jim Kim

If you know the employee's ID number, you can use the **VLOOKUP** function to return either the department or the name of that employee. To obtain the name of employee number 38, you can use the formula **=VLOOKUP (38, A2:C10, 3, FALSE)**. This formula searches for the value 38 in the first column of the range A2:C10, and then returns the value that is contained in the third column of the range and on the same row as the lookup value ("Axel Delgado").

The V in **VLOOKUP** stands for vertical. Use **VLOOKUP** instead of **HLOOKUP** when your comparison values are located in a column to the left of the data that you want to find.

Syntax

```
VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])
```

The VLOOKUP function syntax has the following arguments:

- **lookup_value** Required. The value to search in the first column of the table or range. The *lookup_value* argument can be a value or a reference. If the value you supply for the l*ookup_value* argument is smaller than the smallest value in the first column of the *table_array* argument, **VLOOKUP**

returns the #N/A error value.

- **table_array** Required. The range of cells that contains the data. You can use a reference to a range (for example, **A2:D8**), or a range name. The values in the first column of *table_array* are the values searched by *lookup_value*. These values can be text, numbers, or logical values. Uppercase and lowercase text are equivalent.

- **col_index_num** Required. The column number in the *table_array* argument from which the matching value must be returned. A *col_index_num* argument of 1 returns the value in the first column in *table_array*; a *col_index_num* of 2 returns the value in the second column in *table_array*, and so on.

  If the *col_index_num* argument is:

  - Less than 1, **VLOOKUP** returns the #VALUE! error value.

  - Greater than the number of columns in *table_array*, **VLOOKUP** returns the #REF! error value.

- **range_lookup** Optional. A logical value that specifies whether you want **VLOOKUP** to find an exact match or an approximate match:

  - If *range_lookup* is either TRUE or is omitted, an exact or approximate match is returned. If an exact match is not found, the next largest value that is less than *lookup_value* is returned.

    IMPORTANT   If *range_lookup* is either TRUE or is omitted, the values in the first column of *table_array* must be placed in ascending sort order; otherwise, **VLOOKUP** might not return the correct value.

    For more information, see Sort data in a range or table.

    If *range_lookup* is FALSE, the values in the first column of *table_array* do not need to be sorted.

  - If the *range_lookup* argument is FALSE, **VLOOKUP** will find only an exact match. If there are two or more values in the first column of *table_array* that match the *lookup_value*, the first value found is used. If an exact match is not found, the error value #N/A is returned.

Remarks

- When searching text values in the first column of *table_array*, ensure that the data in the first column of *table_array* does not contain leading spaces, trailing spaces, inconsistent use of straight (' or ") and curly (' or ") quotation marks, or nonprinting characters. In these cases, **VLOOKUP** might return an incorrect or unexpected value.

  For more information, see CLEAN function and TRIM function.

- When searching number or date values, ensure that the data in the first column of *table_array* is not stored as text values. In this case, **VLOOKUP** might return an incorrect or unexpected value.

- If range_lookup is FALSE and *lookup_value* is text, you can use the wildcard characters — the question mark (?) and asterisk (*) — in *lookup_value*. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (**~**) preceding the character.

Example

EXAMPLE 1

This example searches the Density column of an atmospheric properties table to find corresponding values in the Viscosity and Temperature columns. (The values are for air at 0 degrees Celsius at sea level, or 1 atmosphere.)

The example may be easier to understand if you copy it to a blank worksheet.

⊞ How do I copy an example?

	A	B	C
1	**Density**	**Viscosity**	**Temperature**
2	0.457	3.55	500
3	0.525	3.25	400
4	0.606	2.93	300
5	0.675	2.75	250
6	0.746	2.57	200
7	0.835	2.38	150
8	0.946	2.17	100
9	1.09	1.95	50
10	1.29	1.71	0
11	**Formula**	**Description**	**Result**
	=VLOOKUP(1,A2:C10,2)	Using an approximate match, searches for the value 1 in column A, finds the largest value less than or equal to 1 in column A which is 0.946, and then returns the value from column B in the same row.	2.17
12	=VLOOKUP (1,A2:C10,3,TRUE)	Using an approximate match, searches for the value 1 in column A, finds the largest value less than or equal to 1 in column A, which is 0.946, and then returns the value from column C in the same row.	100
	=VLOOKUP (0.7,A2:C10,3,FALSE)	Using an exact match, searches for the value 0.7 in column A. Because there is no exact match in column A, an error is returned.	#N/A
13	=VLOOKUP (0.1,A2:C10,2,TRUE)	Using an approximate match, searches for the value 0.1 in column A. Because 0.1 is less than the smallest value in column A, an error is returned.	#N/A
	=VLOOKUP (2,A2:C10,2,TRUE)	Using an approximate match, searches for the value 2 in column A, finds the largest value less than or equal to 2 in	1.71

14	column A, which is 1.29, and then returns the value from column B in the same row.		
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EXAMPLE 2

This example searches the Item-ID column of a baby products table and matches values in the Cost and Markup columns to calculate prices and test conditions.

The example may be easier to understand if you copy it to a blank worksheet.

⊞ How do I copy an example?

	A	B	C	D
1	**Item-ID**	**Item**	**Cost**	**Markup**
2	ST-340	Stroller	$145.67	30%
3	BI-567	Bib	$3.56	40%
4	DI-328	Diapers	$21.45	35%
5	WI-989	Wipes	$5.12	40%
6	AS-469	Aspirator	$2.56	45%
7	**Formula**	**Description**		**Result**
8	= VLOOKUP("DI-328", A2:D6, 3, FALSE) * (1 + VLOOKUP("DI-328", A2:D6, 4, FALSE))	Calculates the retail price of diapers by adding the markup percentage to the cost.		$28.96
8	= (VLOOKUP("WI-989", A2:D6, 3, FALSE) * (1 + VLOOKUP("WI-989", A2:D6, 4, FALSE))) * (1 - 20%)	Calculates the sale price of wipes by subtracting a specified discount from the retail price.		$5.73
9	= IF(VLOOKUP(A2, A2:D6, 3, FALSE) >= 20, "Markup is " & 100 * VLOOKUP (A2, A2:D6, 4, FALSE) &"%", "Cost is	If the cost of an item is greater than or equal to $20.00, displays the string "Markup is *nn*%"; otherwise, displays the string "Cost is under		Markup is 30%

under $20.00")	$20.00".	
= IF(VLOOKUP(A3, A2:D6, 3, FALSE) >= 20, "Markup is: " & 100 * VLOOKUP (A3, A2:D6, 4, FALSE) &"%", "Cost is $" & VLOOKUP(A3, A2:D6, 3, FALSE))	If the cost of an item is greater than or equal to $20.00, displays the string Markup is: *nn*%"; otherwise, displays the string "Cost is $*n.nn*".	Cost is $3.56

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EXAMPLE 3

This example searches the ID column of an employee table and matches values in other columns to calculate ages and test for error conditions.

The example may be easier to understand if you copy it to a blank worksheet.

⊞ How do I copy an example?

	A	B	C	D	E
	ID	Last name	First name	Title	Birth date
1	1	Davis	Sara	Sales Rep.	12/8/1968
2	2	Fontana	Olivier	V.P. of Sales	2/19/1952
	3	Leal	Karina	Sales Rep.	8/30/1963
3	4	Patten	Michael	Sales Rep.	9/19/1958
	5	Burke	Brian	Sales Mgr.	3/4/1955
4	6	Sousa	Luis	Sales Rep.	7/2/1963
	Formula	**Description**			**Result**
5	=INT(YEARFRAC(DATE (2004,6,30), VLOOKUP (5,A2:E7,5, FALSE), 1))	For the fiscal year 2004, finds the age of the employee with ID equal to 5. Uses the **YEARFRAC** function to subtract the birth date from the fiscal year end date and displays the result as an integer using the **INT** function.			49
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7					
8	=IF(ISNA(VLOOKUP (5,A2:E7,2,FALSE)) = TRUE, "Employee not found", VLOOKUP(5,A2:E7,2,FALSE))	If there is an employee with an ID of 5, displays the employee's last name; otherwise, displays the message "Employee not found".			Burke

9	=IF(ISNA(VLOOKUP (15,A3:E8,2,FALSE)) = TRUE, "Employee not found", VLOOKUP(15,A3:E8,2,FALSE))	The **ISNA** function returns a TRUE value when the **VLOOKUP** function returns the #NA error value. If there is an employee with an ID of 15, displays the employee's last name; otherwise, displays the message "Employee not found". The **ISNA** function returns a TRUE value when the **VLOOKUP** function returns the #NA error value.	Employee not found
10	=VLOOKUP(4,A2:E7,3,FALSE) & " " & VLOOKUP (4,A2:E7,2,FALSE) & " is a " & VLOOKUP(4,A2:E7,4,FALSE)	For the employee with an ID of 4, concatenates the values of three cells into a complete sentence.	Michael Patten is a Sales Rep.
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See Also

- Lookup and reference functions (reference)