INDEX function

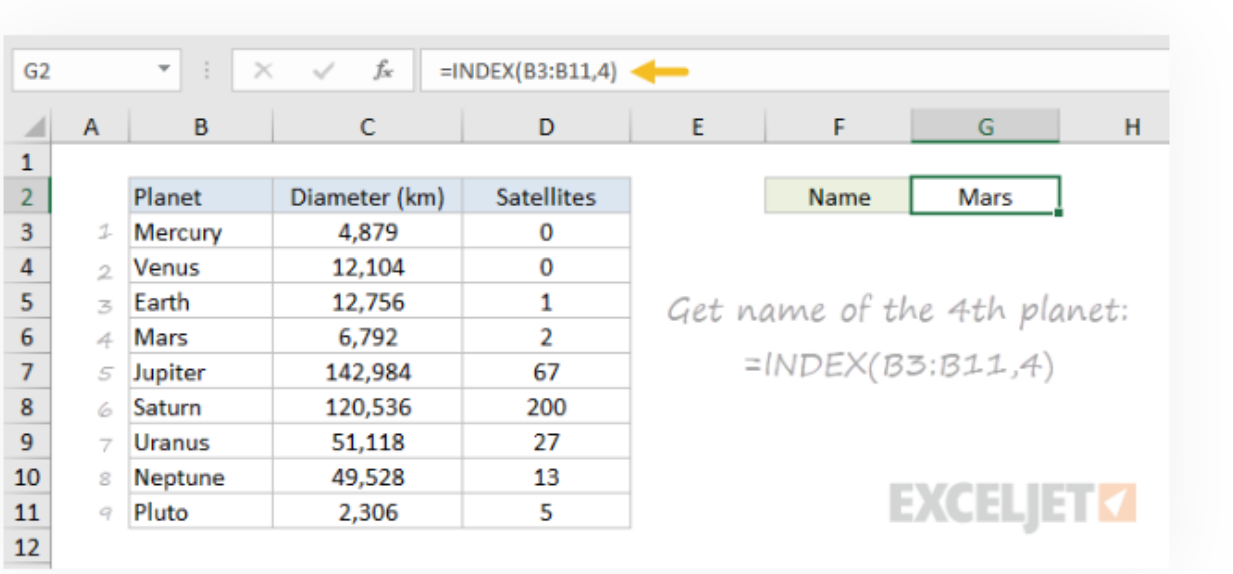
Syntax

INDEX(array, row_num, [column_num])

The array form of the INDEX function has the following arguments:

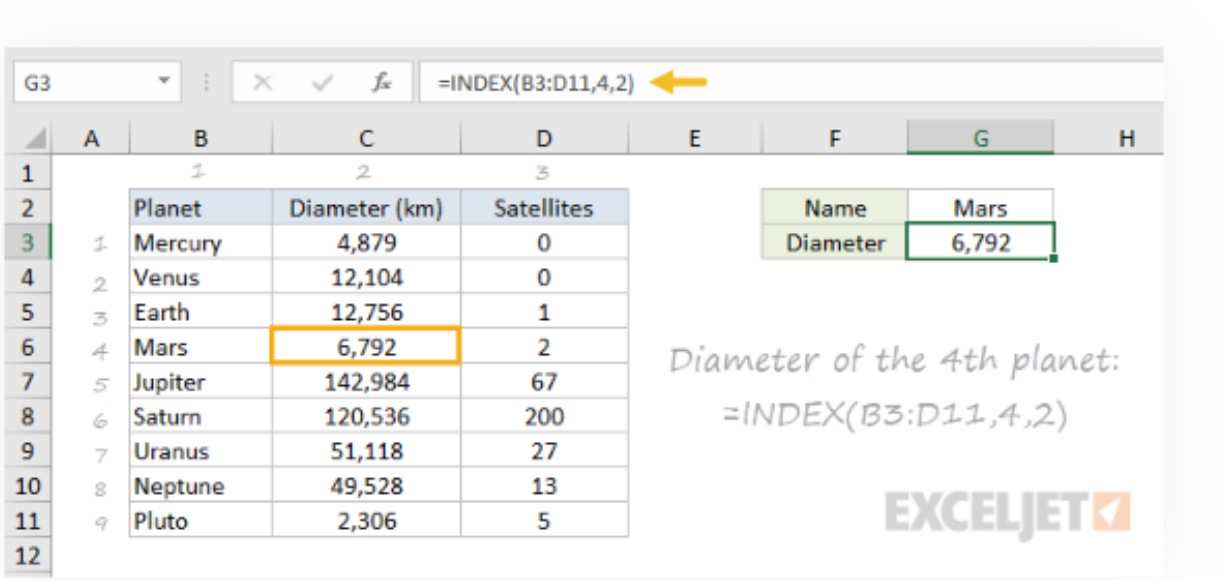
- **array** Required. A range of cells or an array constant.
  - If array contains only one row or column, the corresponding row_num or column_num argument is optional.
  - If array has more than one row and more than one column, and only row_num or column_num is used, INDEX returns an array of the entire row or column in array.
- **row_num** Required, unless column_num is present. Selects the row in array from which to return a value. If row_num is omitted, column_num is required.
- **column_num** Optional. Selects the column in array from which to return a value. If column_num is omitted, row_num is required.

```
=INDEX(B3:B11,4)
```



INDEX returns the value in the 4th row of the range.

```
=INDEX(B3:D11,4,2)
```



INDEX retrieves the value at row 4, column 2.

To summarize, INDEX gets a value at a given location in a range of cells based on numeric position. When the range is one-dimensional, you only need to supply a row number. When the range is two-dimensional, you'll need to supply both the row and column numbers.

MATCH function

Syntax

MATCH(lookup_value, lookup_array, [match_type])

The MATCH function syntax has the following arguments:

- **lookup_value** Required. The value that you want to match in ***lookup_array***. For example, when you look up someone's number in a telephone book, you are using the person's name as the lookup value, but the telephone number is the value you want.

  The ***lookup_value*** argument can be a value (number, text, or logical value) or a cell reference to a number, text, or logical value.

- **lookup_array** Required. The range of cells being searched.

- **match_type** Optional. The number -1, 0, or 1. The ***match_type*** argument specifies how Excel matches ***lookup_value*** with values in ***lookup_array***. The default value for this argument is 1.

Match_type	Behavior
1 or omitted	**MATCH** finds the largest value that is less than or equal to ***lookup_value***. The values in the ***lookup_array*** argument must be placed in ascending order, for example: ...-2, -1, 0, 1, 2, ..., A-Z, FALSE, TRUE.
0	**MATCH** finds the first value that is exactly equal to ***lookup_value***. The values in the ***lookup_array*** argument can be in any order.
-1	**MATCH** finds the smallest value that is greater than or equal to***lookup_value***. The values in the ***lookup_array*** argument must be placed in descending order, for example: TRUE, FALSE, Z-A, ...2, 1, 0, -1, -2, ..., and so on.

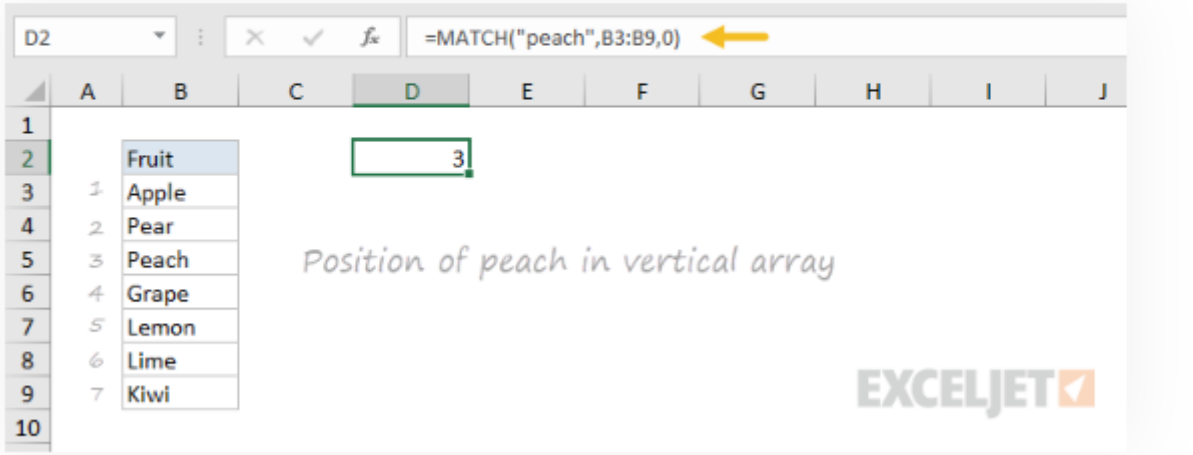
- **MATCH** returns the position of the matched value within ***lookup_array***, not the value itself. For example, **MATCH("b",{"a","b","c"},0)** returns 2, which is the relative position of "b" within the array {"a","b","c"}.

- **MATCH** does not distinguish between uppercase and lowercase letters when matching text values.

- If **MATCH** is unsuccessful in finding a match, it returns the #N/A error value.

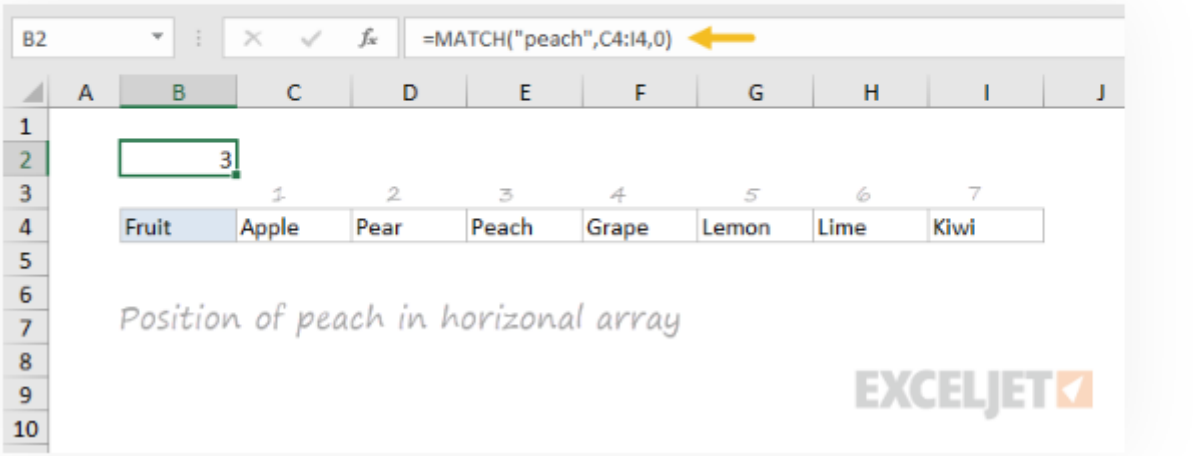
- If ***match_type*** is 0 and ***lookup_value*** is a text string, you can use the wildcard characters — the question mark (**?**) and asterisk (*****) — in the ***lookup_value*** argument. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (**~**) before the character.

```
=MATCH("peach",B3:B9,0)
```



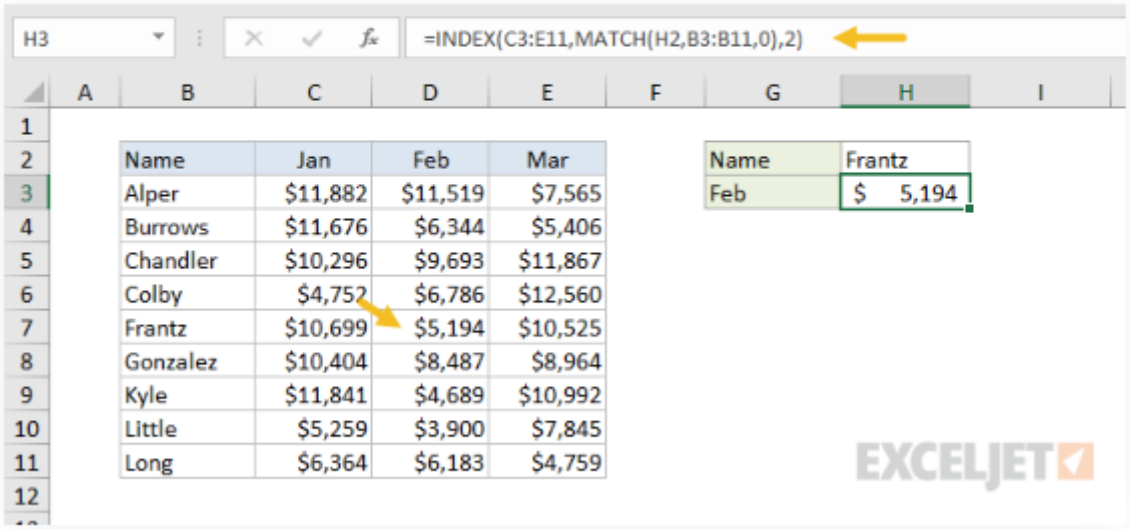
MATCH returns 3, since "Peach" is the 3rd item. MATCH is not case-sensitive.

```
=MATCH("peach",C4:I4,0)
```

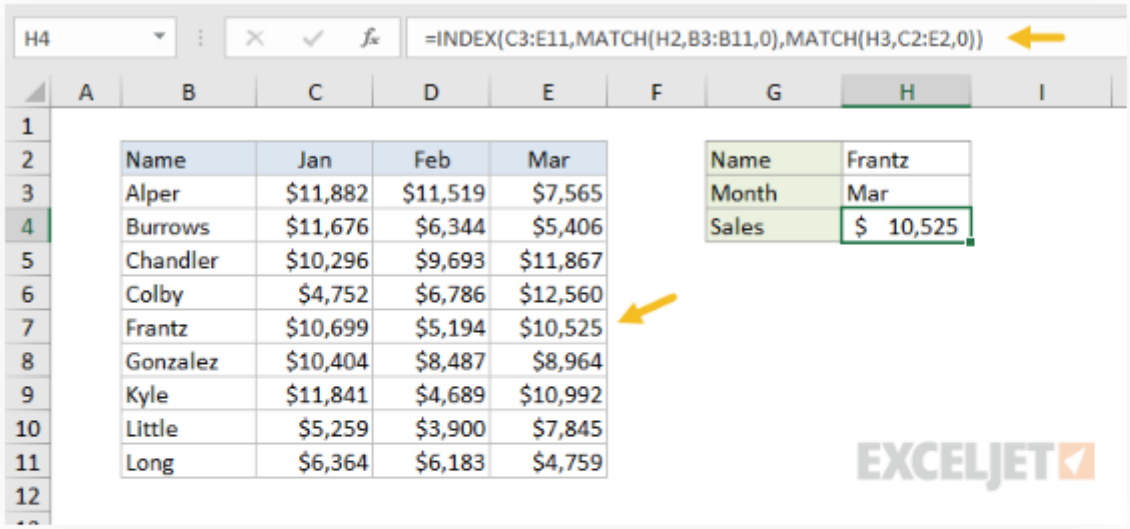


INDEX and MATCH together

```
=INDEX(C3:E11,MATCH(H2,B3:B11,0),2)
```



MATCH finds "Frantz" and returns 5 to INDEX for row.

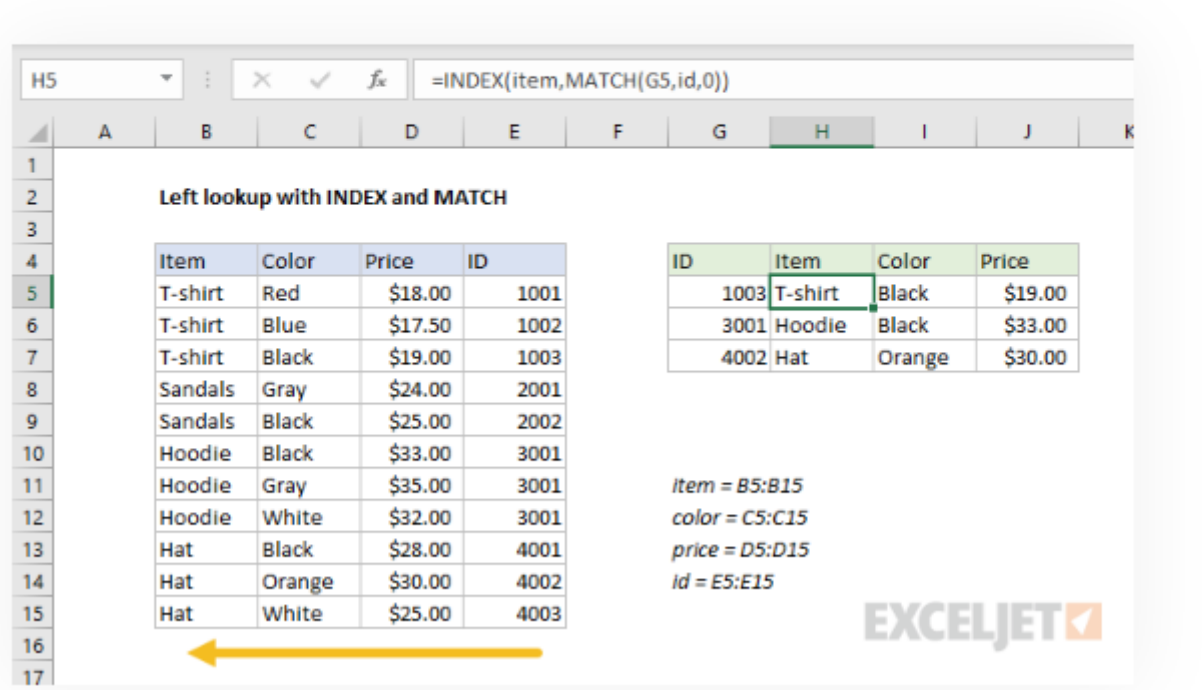


A fully dynamic, two-way lookup with INDEX and MATCH.

```
=INDEX(C3:E11,MATCH(H2,B3:B11,0),MATCH(H3,C2:E2,0))
```

Left lookup

One of the key advantages of INDEX and MATCH over the VLOOKUP function is the ability to perform a "left lookup". Simply put, this just means a lookup where the ID column is to the *right* of the values you want to retrieve, as seen in the example below:

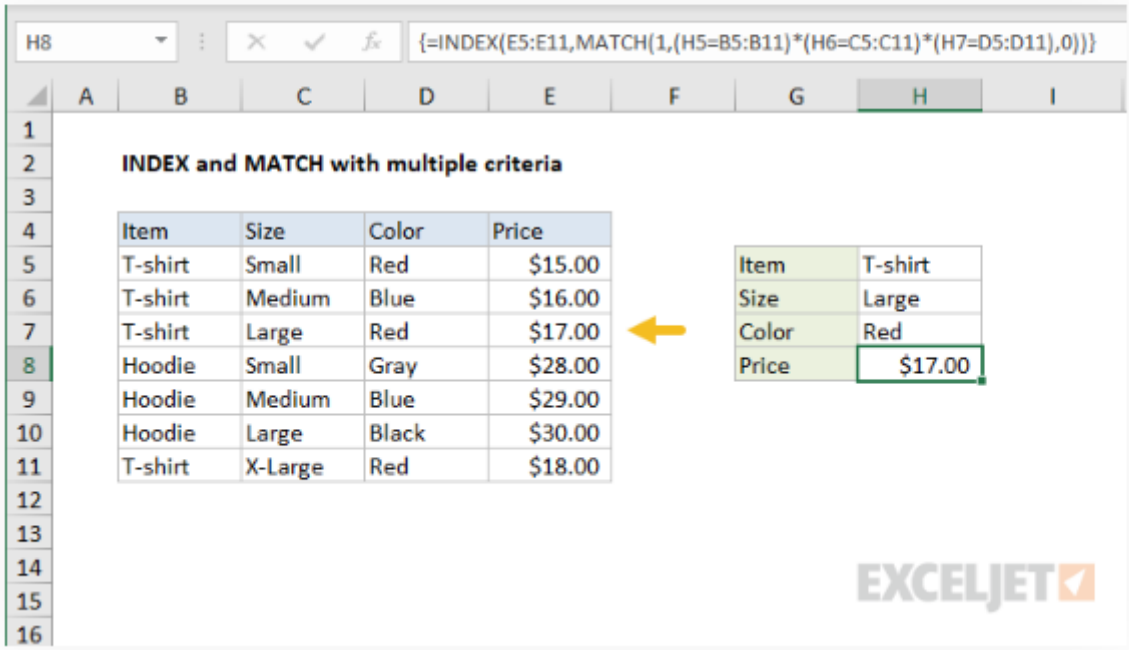


Item	Color	Price	ID
T-shirt	Red	$18.00	1001
T-shirt	Blue	$17.50	1002
T-shirt	Black	$19.00	1003
Sandals	Gray	$24.00	2001
Sandals	Black	$25.00	2002
Hoodie	Black	$33.00	3001
Hoodie	Gray	$35.00	3001
Hoodie	White	$32.00	3001
Hat	Black	$28.00	4001
Hat	Orange	$30.00	4002
Hat	White	$25.00	4003

ID	Item	Color	Price
1003	T-shirt	Black	$19.00
3001	Hoodie	Black	$33.00
4002	Hat	Orange	$30.00

Index and Match with multiple criteria

One of the trickiest problems in Excel is a lookup based on multiple criteria. In other words, a lookup that matches on more than one column at the same time. A nice way to handle these problems is to use Boolean logic, a technique for handling TRUE and FALSE values like 1s and 0s. You can see this approach below, where we are using INDEX and MATCH and Boolean logic to find a price based on three values: Item, Color, and Size:



Item	Size	Color	Price
T-shirt	Small	Red	$15.00
T-shirt	Medium	Blue	$16.00
T-shirt	Large	Red	$17.00
Hoodie	Small	Gray	$28.00
Hoodie	Medium	Blue	$29.00
Hoodie	Large	Black	$30.00
T-shirt	X-Large	Red	$18.00

Item	T-shirt
Size	Large
Color	Red
Price	$17.00