

XLOOKUP Guide

Note: XLOOKUP is not available in Excel 2016 and Excel 2019.

See: <https://support.microsoft.com/en-au/office/xlookup-function-b7fd680e-6d10-43e6-84f9-88eae8bf5929>

XLOOKUP is the next iteration of **VLOOKUP** and offers more flexibility.

XLOOKUP allows you to find values in a table by row and pull values from another column regardless of which side the return column is. It returns the first match it finds.

The formula entered into a cell is formatted to like **this =XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])**

The XLOOKUP formula is made up of 4 parts:

- **lookup_value** (required): What you want to search for (e.g., the identifier that you want to match from one dataset to another)
- **lookup_array** (required): The array or range to search
- **return_array** (required): The array or range to return
- **[if not found]** (optional): When a valid match is not found, the text that you want returned instead. If not found/missing, XLOOKUP defaults to #N/A.
- **[match mode]** (optional)
 - 0: Exact match. If none found, return #N/A (This is the default)
 - -1: Exact match. If none found, return the next smaller item.
 - 1: Exact match. If none found, return the next larger item.
 - 2: Wildcard match: *,? have special meaning
- **[search mode]** (optional)
 - 1: Perform a search starting at the first item. (This is the default)
 - -1: Perform a reverse search starting at the last item.
 - 2: Perform a binary search that relies on lookup_array being sorted in *ascending order*. If not sorted, invalid results will be returned.
 - -2: Perform a binary search that relies on lookup_array being sorted in *descending order*. If not sorted, invalid results will be returned.

Scenario: We have two spreadsheets about the United State: 1) Includes information about each state, its capitol, and area and 2) Includes information about each state and state bird. We are interested in combining pulling information about the state bird into the same spreadsheet that has the state capitol.

Data Set 1: State Birds

	A	B	C
1	State, district, or territory	Year	Bird
2	Alabama	1927	Yellowhammer (northern flicker)
3	Alaska	1955	Willow ptarmigan
4	Arizona	1973	Cactus wren
5	Arkansas	1929	Northern mockingbird
6	California	1931	California quail
7	Colorado	1931	Lark bunting
8	Connecticut	1943	American robin
9	Delaware	1939	Delaware Blue Hen
10	District of Columbia	1938	Wood thrush
11	Florida	1927	Northern mockingbird
12	Georgia	1928	Brown thrasher
13	Guam	2000	Guam rail (ko'ko')
14	Hawaii	1957	Hawaiian goose (nēnē)
15	Idaho	1931	Mountain bluebird
16	Illinois	1929	Northern cardinal
17	Indiana	1933	Northern cardinal
18	Iowa	1933	Eastern goldfinch (American goldfinch)
19	Kansas	1933	Western meadowlark
20	Kentucky	1926	Northern cardinal
21	Louisiana	1966	Brown pelican
22	Maine	1927	Chickadee
23	Maryland	1947	Baltimore oriole
24	Massachusetts	1941	Black-capped chickadee
25	Michigan	1931	American robin

Data Set 2: State Capitols

	A	B	C	D
1	Capital	State	Since	Area (mi2)
2	Montgomery	Alabama	1846	159.8
3	Juneau	Alaska	1906	2716.7
4	Phoenix	Arizona	1912	517.6
5	Little Rock	Arkansas	1821	116.2
6	Sacramento	California	1854	97.9
7	Denver	Colorado	1867	153.3
8	Hartford	Connecticut	1875	17.3
9	Dover	Delaware	1777	22.4
10	Tallahassee	Florida	1824	95.7
11	Atlanta	Georgia	1868	133.5
12	Honolulu	Hawaii	1845	68.4
13	Boise	Idaho	1865	63.8
14	Springfield	Illinois	1837	54
15	Indianapolis	Indiana	1825	361.5
16	Des Moines	Iowa	1857	75.8
17	Topeka	Kansas	1856	56
18	Frankfort	Kentucky	1792	14.7
19	Baton Rouge	Louisiana	1880	76.8
20	Augusta	Maine	1832	55.4
21	Annapolis	Maryland	1694	6.73
22	Boston	Massachusetts	1630	89.6
23	Lansing	Michigan	1847	35
24	Saint Paul	Minnesota	1849	52.8
25	Jackson	Mississippi	1821	104.9

PREPARING YOUR DATA FILE

While you can use XLOOKUP to pull information across two different Excel workbooks, it is often easier as this is a live function to have all data in one workbook on separate sheets (i.e., tabs on the bottom of the workbook). This can be done by copy and pasting into a new tab, or right clicking the sheet containing the report from one workbook and selecting “Move or Copy” to move it to the other workbook.

CREATING TABLES

To prepare your data files, it can be helpful for your spreadsheet or data to be in Table format. That way, when you enter the XLOOKUP formula, it will apply to the entire column. The Excel practice workbook already has both data sets in Table Format, so you can **skip to page 5** of this guide.

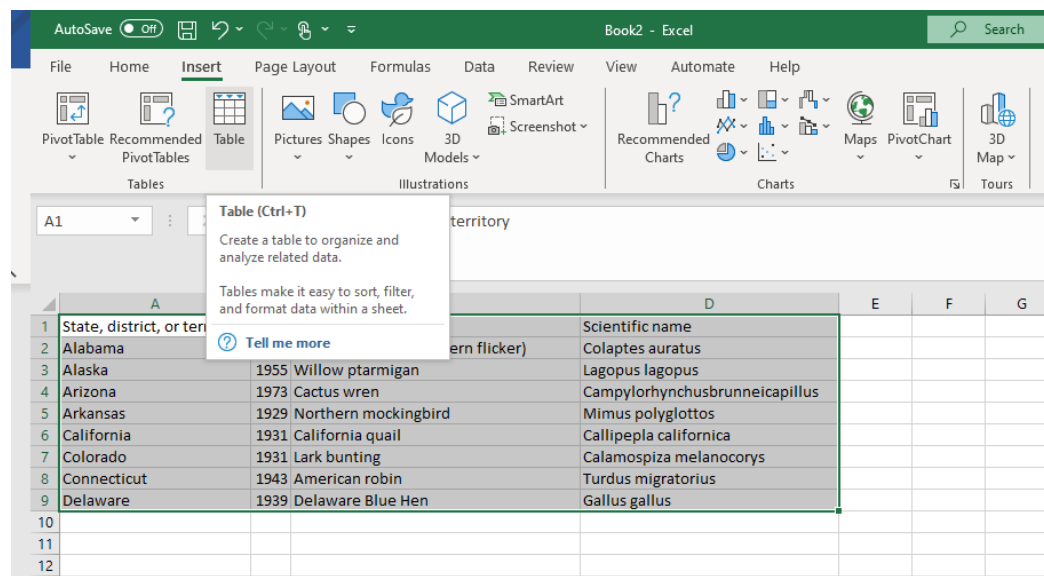
If however, you are starting from scratch, to turn your spreadsheet into a table:

Step 1: Select the cells that you want to include in your table.

In this example, you would click on the *State, district, or territory* cell, and drag your mouse so all the data is selected OR click in the *State, district, or territory* cell and press Ctrl+A. You know which cells are selected when they are highlighted in grey.

	A	B	C	D
1	State, district, or territory	Year	Bird	Scientific name
2	Alabama	1927	Yellowhammer (northern flicker)	Colaptes auratus
3	Alaska	1955	Willow ptarmigan	Lagopus lagopus
4	Arizona	1973	Cactus wren	Campylorhynchus brunneicapillus
5	Arkansas	1929	Northern mockingbird	Mimus polyglottos
6	California	1931	California quail	Callipepla californica
7	Colorado	1931	Lark bunting	Calamospiza melanocorys
8	Connecticut	1943	American robin	Turdus migratorius

Step 2: On your navigation bar, click on the Insert menu and then click on **Table**.



Step 3: Because you have already selected your cells, a dotted rectangle now forms around your selection. In addition to this visual, the Create Table also shows you which cells are being selected. Be

sure to check the “My table has headers” so the first row or column headings and Passenger Name become the first row and header for your table. Click OK.

	A	B	C	D	E
1	State, district, or territory	Year	Bird	Scientific name	
2	Alabama	1927	Yellowhammer (northern flicker)	Colaptes auratus	
3	Alaska	1955	Willow ptarmigan	Lagopus lagopus	
4	Arizona	1973	Cactus wren	Campylorhynchus brunneicapillus	
5	Arkansas	1929	Northern mockingbird	Mimus polyglottos	
6	California	1931	California quail	Callipepla californica	
7	Colorado	1931	Lark bunting	Calamospiza melanocorys	
8	Connecticut	1943	American robin	Turdus migratorius	
9	Delaware	1939	Delaware Blue Hen	Gallus gallus	
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

Create Table

?

×

Where is the data for your table?

SAS1:SDS9

☒ My table has headers

OK

Cancel

Step 4: Once you click OK, your data is now in a Table format. The default format is below (i.e., blue and white alternating).

	A	B	C	D
1	State, district, or territory	Year	Bird	Scientific name
2	Alabama	1927	Yellowhammer (northern flicker)	Colaptes auratus
3	Alaska	1955	Willow ptarmigan	Lagopus lagopus
4	Arizona	1973	Cactus wren	Campylorhynchus brunneicapillus
5	Arkansas	1929	Northern mockingbird	Mimus polyglottos
6	California	1931	California quail	Callipepla californica
7	Colorado	1931	Lark bunting	Calamospiza melanocorys
8	Connecticut	1943	American robin	Turdus migratorius
9	Delaware	1939	Delaware Blue Hen	Gallus gallus

If you would like to change the Table design, in the menu bar, click on any of the other styles.

Table Design

☒ Filter Button

Table Styles

HOW TO USE XLOOKUP

Step 1: Decide which column or where in your spreadsheet you would like to add the information that you are pulling from the other spreadsheet. Insert (if applicable) and add a Name for that Column.

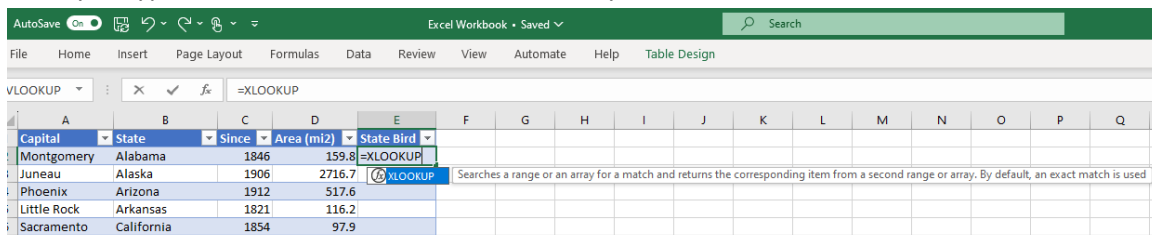
In our example spreadsheet, we are just adding a column at the end of the **BONUS_XLOOKUP-State Capitol** sheet. Name this column "State Bird". Because this is already in a Table format, if you type in State Bird in Column E it automatically is added to the full table.

	A	B	C	D	E
1	Capital	State	Since	Area (mi2)	State Bird
2	Montgomery	Alabama	1846	159.8	
3	Juneau	Alaska	1906	2716.7	
4	Phoenix	Arizona	1912	517.6	
5	Little Rock	Arkansas	1821	116.2	
6	Sacramento	California	1854	97.9	

Step 2: In the empty cell under State Bird on that first row (i.e., E2), type in the beginning of the XLOOKUP formula. Or the equal sign XLOOKUP and an open parenthesis

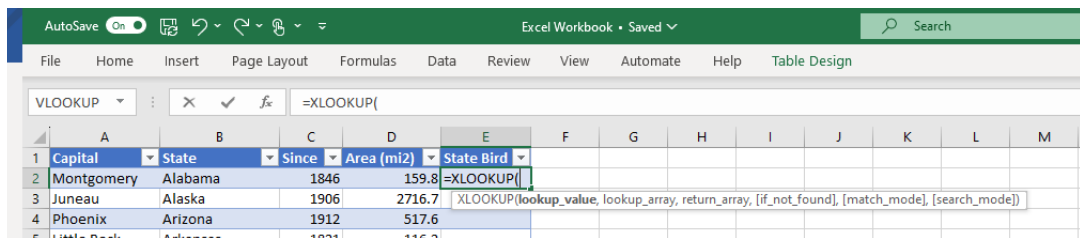
=XLOOKUP(

Once you type in the XLOOKUP, Excel will then tell you what the function is...



After you add the parenthesis, Excel will then tell you what pieces you will have to include separated by a comma, bolding what piece of the formula is next.

(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])



Step 3: Identify the lookup_value or the value that you want to look up.

To identify the lookup_value, click on what you want to look up or your identifier. In this example, it is the ticket number. So the first cell of that column or B2. You will know it has been selected because it is now surrounded by a dotted rectangle. Your formula has now been updated to read as:

=XLOOKUP([@State])

	A	B	C	D	E	F	G	H
1	Capital	State	Since	Area (mi2)	State Bird			
2	Montgomery	Alabama	1846	159.8	=XLOOKUP([@State])			
3	Juneau	Alaska	1906	2716.7				
4	Phoenix	Arizona	1912	517.6				
5	Little Rock	Arkansas	1821	116.2				
6	Sacramento	California	1854	97.9				
7	Denver	Colorado	1867	153.3				
8	Hartford	Connecticut	1875	17.3				
9	Dover	Delaware	1777	22.4				
10	Tallahassee	Florida	1824	95.7				

Add a comma at the end.

=XLOOKUP([@State],

Step 4: Select the lookup_array of where you are searching for your identifier.

In our scenario, we are looking to match the State. Go to the **BONUS_XLOOKUP-Bird** tab, hover over the first column or (State, district, or territory) near the letter A until a downward arrow is displayed to select the column. Click your mouse. This will select that column of the table. You know what data has been selected by what is now highlighted and included within the dashed rectangular border. Add a comma at the end.

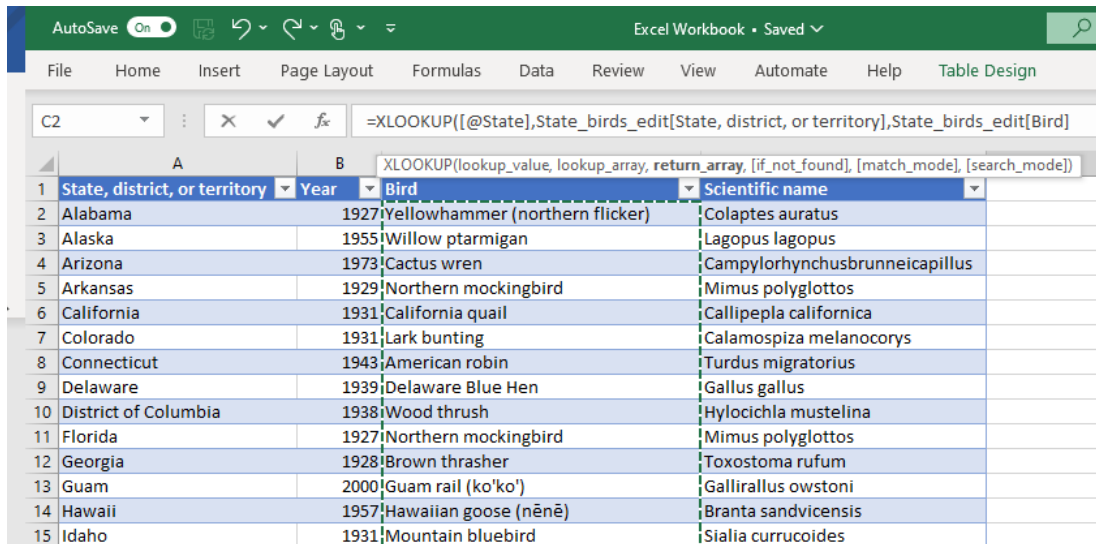
	A	B	C	D
1	State, district, or territory	Year	Bird	Scientific name
2	Alabama	1927	Yellowhammer (northern flicker)	Colaptes auratus
3	Alaska	1955	Willow ptarmigan	Lagopus lagopus
4	Arizona	1973	Cactus wren	Campylorhynchus brunneicapillus
5	Arkansas	1929	Northern mockingbird	Mimus polyglottos
6	California	1931	California quail	Callipepla californica
7	Colorado	1931	Lark bunting	Calamospiza melanocorys
8	Connecticut	1943	American robin	Turdus migratorius
9	Delaware	1939	Delaware Blue Hen	Gallus gallus
10	District of Columbia	1938	Wood thrush	Hylocichla mustelina
11	Florida	1927	Northern mockingbird	Mimus polyglottos
12	Georgia	1928	Brown thrasher	Toxostoma rufum
13	Guam	2000	Guam rail (ko'ko')	Gallirallus owstoni
14	Hawaii	1957	Hawaiian goose (nēnē)	Branta sandvicensis

Your formula has now automatically updated to:

=XLOOKUP([@State],State_birds_edit[State, district, or territory],

Step 5: Select the array that has the value that you want to match and add to your spreadsheet (i.e., the `return_array`).

In this example, you want to return the Bird. Similar to the previous step, hover over the bird column near the letter C until a downward arrow shows up. Click your mouse. You will see the dotted rectangle selecting this column.



	A	B	C	D
	State, district, or territory	Year	Bird	Scientific name
1				
2	Alabama	1927	Yellowhammer (northern flicker)	Colaptes auratus
3	Alaska	1955	Willow ptarmigan	Lagopus lagopus
4	Arizona	1973	Cactus wren	Campylorhynchus brunneicapillus
5	Arkansas	1929	Northern mockingbird	Mimus polyglottos
6	California	1931	California quail	Callipepla californica
7	Colorado	1931	Lark bunting	Calamospiza melanocorys
8	Connecticut	1943	American robin	Turdus migratorius
9	Delaware	1939	Delaware Blue Hen	Gallus gallus
10	District of Columbia	1938	Wood thrush	Hylocichla mustelina
11	Florida	1927	Northern mockingbird	Mimus polyglottos
12	Georgia	1928	Brown thrasher	Toxostoma rufum
13	Guam	2000	Guam rail (ko'ko')	Gallirallus owstoni
14	Hawaii	1957	Hawaiian goose (nēnē)	Branta sandvicensis
15	Idaho	1931	Mountain bluebird	Sialia currucoides

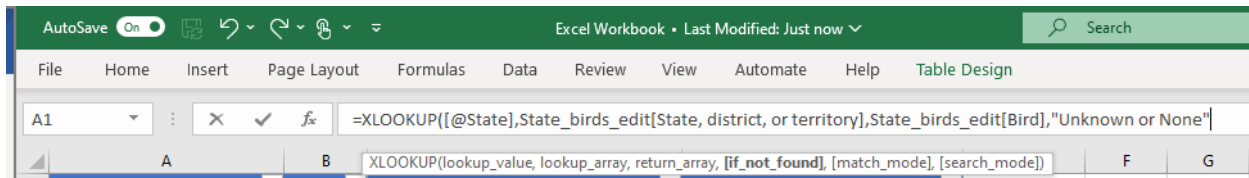
At this step of the XLOOKUP, you can end here and add a closed parenthesis or continue to the optional parts of the function. If you end here, the next 3 parts of the function default (i.e., #N/A is the value that will return, exact match #N/A will be returned if the value you are searching for is not found, search starts from the top or the first item). If ending here, add the parenthesis and press Enter.

=XLOOKUP([@State],State_birds_edit[State, district, or territory],State_birds_edit[Bird])

If you add a comma, you move on to the next step of the function or **[if not found]**

Step 6: Specify what value between quotation marks “ “ you want to return if what you are searching for is not present (i.e., what you are searching for is not in the lookup_array column to bring back a match). This step is optional. If you do not specify a value here, #N/A will automatically return.

In our scenario, we want the spreadsheet to say “Unknown or None” if the value is not found. After the comma, type in “Unknown or None”



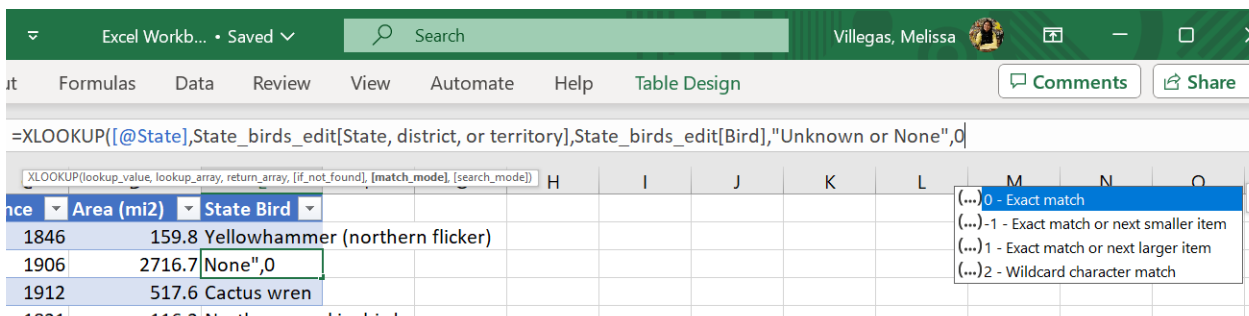
At this step of the XLOOKUP, similar to the previous step, you can end here and add a closed parenthesis. If you end here, the next 2 parts of the function default (i.e., exact match #N/A will be returned if the value you are searching for is not found, search starts from the top or the first item). If ending here, add the parenthesis and press Enter.

=XLOOKUP([@State],State_birds_edit[State,district,or territory],State_birds_edit[Bird],\"Unknown or None\")

If you add a comma, you move on to the next step of the function or the **[match mode]**

Step 7: Specify the type of match (i.e., 0=Exact match, -1=Exact match or next smaller item, `=Exact match or next larger item, 2=Wildcard character match)

In our scenario, **Exact Match** is the type of match we are looking for. Type in the **0**.



At this step of the XLOOKUP, similar to the previous step, you can either end here and add a closed parenthesis and press Enter. If you end here, last part of the function defaults (i.e., searches first-to-last or starting at the first item).

=XLOOKUP([@State],State_birds_edit[State,district,or territory],State_birds_edit[Bird],\"Unknown or None\",0)

If you add a comma, you move on to the next step of the function or the **[search mode]**

Step 7: Specify how you want the XLOOKUP to search (i.e., 1=Search first-to-last, -1=Search last-to-first, 2=Binary search (sorted ascending order), -2=Binary search (sorted descending order))

In our scenario, we want to **Search first-to-last**. Type in the 1, add a closed parenthesis, and press Enter.

This will be the final formula:

```
=XLOOKUP([@State],State_birds_edit[State, district, or territory],State_birds_edit[Bird],"Unknown or None",0,1)
```

You can now see that the State Bird has now been populated on your State Capitols spreadsheet. And because this is already in a Table format, the State Bird was added to each row. Where there was no State Bird present (e.g., Pennsylvania), “Unknown or None” was returned instead. This means that Pennsylvania was not on the State Bird spreadsheet.

File Home Insert Page Layout Formulas Data Review View Automate Help Table Design										
E2		=XLOOKUP([@State],State_birds_edit[State, district, or territory],State_birds_edit[Bird],"Unknown or None",0,1)								
1	Capital	State	Since	Area (mi2)	State Bird	F	G	H	I	J
2	Montgomery	Alabama	1846	159.8	Yellowhammer (northern flicker)					
3	Juneau	Alaska	1906	2716.7	Willow ptarmigan					
4	Phoenix	Arizona	1912	517.6	Cactus wren					
5	Little Rock	Arkansas	1821	116.2	Northern mockingbird					
6	Sacramento	California	1854	97.9	California quail					
7	Denver	Colorado	1867	153.3	Lark bunting					
8	Hartford	Connecticut	1875	17.3	American robin					

For more information about XLOOKUP:



<https://support.microsoft.com/en-au/office/xlookup-function-b7fd680e-6d10-43e6-84f9-88eae8bf5929>