

What is the purpose of the Excel XOR function and how is it used in spreadsheet calculations?

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The Excel XOR function is an logical function used in spreadsheet calculations to determine whether a given set of conditions are true or false. Its purpose is to perform an exclusive logical disjunction, meaning it will return a TRUE value only if one of the conditions is TRUE and the other is FALSE. This function is particularly useful in data analysis and decision making, as it allows for the evaluation of multiple conditions simultaneously. It can also be used in conjunction with other functions to create complex logical expressions. Overall, the XOR function serves as a valuable tool for making efficient and accurate calculations in Excel.

Excel XOR Function

XOR Function

The **XOR** function is a premade function in Excel, which returns **TRUE** or **FALSE** based on two or more **conditions**.

Note: The XOR function is often used together with the IF function.

It is typed =XOR:

=XOR(, , ...)

The **conditions** are referred to as , , and so on.

The conditions can check things like:

If a number is **greater than** another number > If a number is **smaller than** another number < If a number or text is **equal** to something =

For two conditions, you can think of the XOR function as:

"**either** this **or** that, but **not both**"

Note: The different parts of the function are separated by a symbol, like comma , or semicolon ;

The symbol depends on your Language Settings.

Example XOR Function

Check if the Pokemon type is either Fire type **OR** has HP **less than** 60, but **not both**:

The function returns "TRUE" or "FALSE".

	A	B	C	D	E
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP	
2	Bulbasaur	Grass	45		
3	Ivysaur	Grass	60		
4	Venusaur	Grass	80		
5	Charmand	Fire	39		
6	Charmeleon	Fire	58		
7	Charizard	Fire	78		
8	Squirtle	Water	44		
9	Wartortle	Water	59		
10	Blastoise	Water	79		
11					

Example **XOR** function, step by step:

Select the cell D2 Type `=XOR` Double click the **XOR** command

	A	B	C	D	E	F
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP		
2	Bulbasaur	Grass	45	=XOR		
3	Ivysaur	Grass	60			
4	Venusaur	Grass	80			
5	Charmand	Fire	39			
6	Charmeleon	Fire	58			
7	Charizard	Fire	78			
8	Squirtle	Water	44			
9	Wartortle	Water	59			
10	Blastoise	Water	79			
11						

Specify the first condition B2="Fire" Type , Specify the second condition C2Hit enter

Note: You can add more conditions by repeating steps 5-6 before hitting enter.

The XOR function returns "TRUE" if an **odd** number (1,3,5,..) of conditions are **TRUE**.

	A	B	C	D	E
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP	
2	Bulbasaur	Grass	45	=XOR(B2="Fire"; C2<60	
3	Ivysaur	Grass	60	XOR (logical1; [logical2]; [logical3]; ...)	
4	Venusaur	Grass	80		
5	Charmander	Fire	39		
6	Charmeleon	Fire	58		
7	Charizard	Fire	78		
8	Squirtle	Water	44		
9	Wartortle	Water	59		
10	Blastoise	Water	79		
11					

Since the value in cell B2 is not "Fire" the first condition is **FALSE**.

Since the value in cell C2 is less than 60 the second condition is **TRUE**.

For two conditions, **only one** condition should to be **TRUE** for the XOR function to return **TRUE**.

Note: Text values needs to be in quotes: ""

The function can be repeated with the filling function for each row to perform the same check for each Pokemon:

	A	B	C	D	E
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP	
2	Bulbasaur	Grass	45	=XOR(B2="Fire"; C2<60)	
3	Ivysaur	Grass	60	=XOR(B3="Fire"; C3<60)	
4	Venusaur	Grass	80	=XOR(B4="Fire"; C4<60)	
5	Charmander	Fire	39	=XOR(B5="Fire"; C5<60)	
6	Charmeleon	Fire	58	=XOR(B6="Fire"; C6<60)	
7	Charizard	Fire	78	=XOR(B7="Fire"; C7<60)	
8	Squirtle	Water	44	=XOR(B8="Fire"; C8<60)	
9	Wartortle	Water	59	=XOR(B9="Fire"; C9<60)	
10	Blastoise	Water	79	=XOR(B10="Fire"; C10<60)	
11				XOR (logical1; [logical2]; [logical3]; ...)	
12					

Now, each row has a check for Fire Type **or** HP less than 60, but **not both**:

	A	B	C	D	E
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP	
2	Bulbasaur	Grass	45	TRUE	
3	Ivysaur	Grass	60	FALSE	
4	Venusaur	Grass	80	FALSE	
5	Charmander	Fire	39	FALSE	
6	Charmeleon	Fire	58	FALSE	
7	Charizard	Fire	78	TRUE	
8	Squirtle	Water	44	TRUE	
9	Wartortle	Water	59	TRUE	
10	Blastoise	Water	79	FALSE	
11					

For example:

Ivysaur is **not** Fire type, but it also does not have **less** than 60 defense, so the function returns "FALSE". Charmeleon **is** Fire type, and has **less** than 60 defense, so the function returns "FALSE". Wartortle is **not** Fire type, but has **less** than 60 defense, so the function returns "TRUE".

Example XOR Function (with IF)

Combining the XOR function with an IF function lets you check **multiple** conditions for the IF function:

Note: The IF function lets you specify the return values.

The IF function is typed `=IF` and has 3 parts:

`=IF(logical_test, , )`

The XOR function takes the place of the `logical_test` condition.

Here, the **IF** function returns "Yes" or "No".

Example **XOR** function as the condition for **IF** function, step by step:

Select cell C2Type `=IF` Double click the **IF** command

	A	B	C	D	E	F	G	H	I
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP					
2	Bulbasaur	Grass	45	=IF					
3	Ivysaur	Grass	60	IF					
4	Venusaur	Grass	80	IFERROR					
5	Charmander	Fire	39	IFNA					
6	Charmeleon	Fire	58	IFS					
7	Charizard	Fire	78						
8	Squirtle	Water	44						
9	Wartortle	Water	59						
10	Blastoise	Water	79						
11									

Type XOR Double click the **XOR** command

	A	B	C	D	E	F
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP		
2	Bulbasaur	Grass	45	=IF(XOR		
3	Ivysaur	Grass	60			
4	Venusaur	Grass	80			
5	Charmander	Fire	39			
6	Charmeleon	Fire	58			
7	Charizard	Fire	78			
8	Squirtle	Water	44			
9	Wartortle	Water	59			
10	Blastoise	Water	79			
11						

Specify the first condition B2="Fire"Type , Specify the second condition C2Type), Specify the value "Yes" for when just one condition is **TRUE**Type , Specify the value "No" for when both are **FALSE**, or **TRUE** at the same timeType) and hit enter

	A	B	C	D	E	F
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP		
2	Bulbasaur	Grass	45	=IF(XOR(B2="Fire"; C2<60); "Yes"; "No")		
3	Ivysaur	Grass	60			
4	Venusaur	Grass	80			
5	Charmander	Fire	39			
6	Charmeleon	Fire	58			
7	Charizard	Fire	78			
8	Squirtle	Water	44			
9	Wartortle	Water	59			
10	Blastoise	Water	79			
11						

The function can be repeated with the filling function for each row to perform the same check for each Pokemon:

	A	B	C	D	E
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP	
2	Bulbasaur	Grass	45	=IF(XOR(B2="Fire"; C2<60); "Yes"; "No")	
3	Ivysaur	Grass	60	=IF(XOR(B3="Fire"; C3<60); "Yes"; "No")	
4	Venusaur	Grass	80	=IF(XOR(B4="Fire"; C4<60); "Yes"; "No")	
5	Charmander	Fire	39	=IF(XOR(B5="Fire"; C5<60); "Yes"; "No")	
6	Charmeleon	Fire	58	=IF(XOR(B6="Fire"; C6<60); "Yes"; "No")	
7	Charizard	Fire	78	=IF(XOR(B7="Fire"; C7<60); "Yes"; "No")	
8	Squirtle	Water	44	=IF(XOR(B8="Fire"; C8<60); "Yes"; "No")	
9	Wartortle	Water	59	=IF(XOR(B9="Fire"; C9<60); "Yes"; "No")	
10	Blastoise	Water	79	=IF(XOR(B10="Fire"; C10<60); "Yes"; "No")	
11				IF (logical_test; [value_if_true]; [value_if_false])	
12					

Now, each row has a check for Water Type **or** Defense greater than 60, but **not both**:

	A	B	C	D	E
1	Name	Type 1	HP	EITHER Fire Type OR less than 60 HP	
2	Bulbasaur	Grass	45	Yes	
3	Ivysaur	Grass	60	No	
4	Venusaur	Grass	80	No	
5	Charmander	Fire	39	No	
6	Charmeleon	Fire	58	No	
7	Charizard	Fire	78	Yes	
8	Squirtle	Water	44	Yes	
9	Wartortle	Water	59	Yes	
10	Blastoise	Water	79	No	
11					

For example:

Ivysaur is **not** Fire type, but it also does not have **less** than 60 defense, so the function returns "No". Charmeleon **is** Fire type, and has **less** than 60 defense, so the function returns "No". Wartortle is **not** Fire type, but has **less** than 60 defense, so the function returns "Yes".

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