

What is the XOR function in Google Sheets?

Authored by
stats writer

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The XOR function in Google Sheets is a logical function that returns a TRUE or FALSE value based on the exclusive OR operation between two or more logical expressions. It is commonly used to check for mutually exclusive conditions and to determine if only one condition is met. The function can be accessed through the "fx" button in the formula bar and is useful for making logical comparisons and creating complex formulas in Google Sheets.

Google Sheets XOR Function

XOR Function

The **XOR** function is a premade function in Google Sheets, 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(logical_expression1,)

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**"

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	Charmander	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**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	XOR		
4	Venusaur	Grass	80	Logical xor operator.		
5	Charmander	Fire	39			
6	Charmeleon	Fire	58			
7	Charizard	Fire	78			
8	Squirtle	Water	44			
9	Wartortle	Water	59			
10	Blastoise	Water	79			
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Specify the first condition **B2="Fire"**Type , Specify the second condition **C2**Hit 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	F
1	Name	Type 1	HP	Fire Type OR less than 60 HP		
2	Bulbasaur	Grass	45	=XOR(B2="Fire", C2<60)		
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			
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TRUE x

XOR(logical_expression1, [logical_expression2, ...])

EXAMPLE
XOR(A1=1, A2=2)

ABOUT
Returns true if an odd number of the provided arguments are logically true, and false if an even number of the arguments are logically true.

logical_expression1
An expression or reference to a cell containing an expression that represents some logical value, i.e. TRUE or FALSE, or an expression that can be coerced to a logical value.

logical_expression2... - [optional] repeatable
More expressions that represent logical values.

[Learn more](#)

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 also **FALSE**.

For two conditions, **only one** condition should 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)	
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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	
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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_expression, value_if_true, value_if_false)`

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

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

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

Select cell `C2`Type `=IF`Click the **IF** 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		
3	Ivysaur	Grass	60	IF		
4	Venusaur	Grass	80	Returns value depending on logical expression.		
5	Charmander	Fire	39	IFS		
6	Charmeleon	Fire	58	IFNA		
7	Charizard	Fire	78	SUMIF		
8	Squirtle	Water	44	MAXIFS		
9	Wartortle	Water	59	MINIFS		
10	Blastoise	Water	79	SUMIFS		
11				COUNTIF		
12				DATEDIF		
13				IFERROR		
14						

Type `XOR`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	XOR		
4	Venusaur	Grass	80	Logical xor operator.		
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 C2<60 Type) , 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 time Type) 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			
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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					

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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