

## **Introduction**

Excel Equations Beginner Section will explain the basics of how to use excel equations.

Go down to Excel Equations Advanced to see how to use relatable equations for NSEA projects.

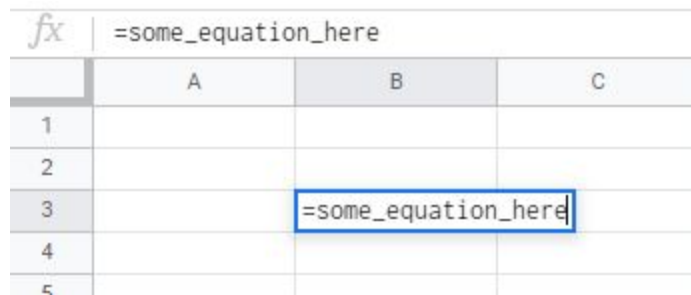
## **Vocabulary:**

**Concatenation:** Often heard by Computer Science people, but we use concatenation all the time. Essentially it's an action of linking things together in a series. For example, our names are concatenated. My first name is Taichen, my last name is Rose. If we concatenate (combine) these two words, we have Taichen Rose. So when someone says concatenate think of a combination of something.

## **Excel Equations Beginner:**

Excel has a LOT of useful equations, from concatenating words, numbers together, or to doing math equations. For our purposes, we only need to understand how to do specific equations to concatenate words together to make our lives easier.

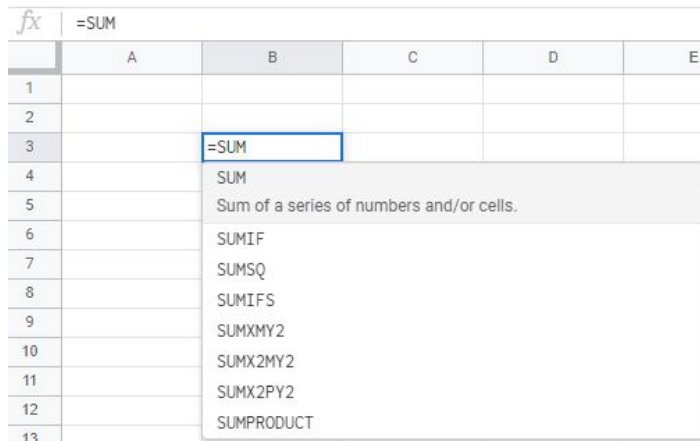
Excel equations ALWAYS start with an equal sign (=). Here is an example:



	A	B	C
1			
2			
3		=some_equation_here	
4			
5			

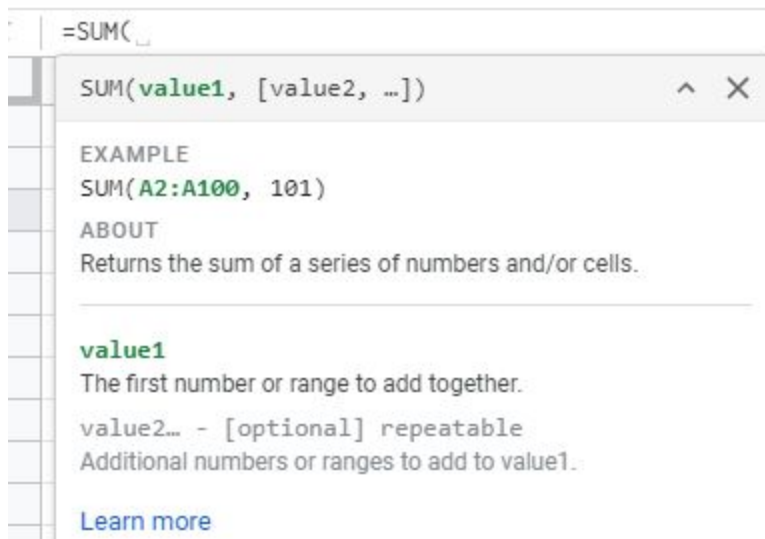
Starting with an = sign means the start of us calling a built in function. (I'm using google sheets for this demo, but excel will be the same). Equation names will always be capitalized.

Example: If we want to add a number, we use the SUM equation.



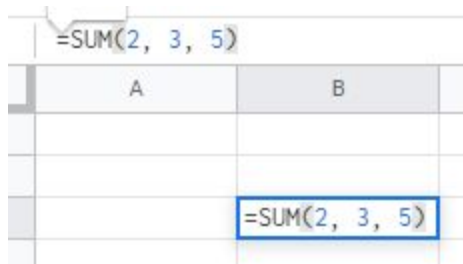
Notice how when we start typing, possible equations we can use will show up. Lets use this sum equation as more of an example. Lets add numbers together. When I get the equation I want which is the SUM equation, start with open parenthesis to feed the equation stuff. When you open a parenthesis, it will give you more details on how to use.

Example:



This tells me it can take in X amount of values. Separated by a comma, so I can add 2 numbers or I can add 1000).

Close the parenthesis when you are done, and type enter.



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The screenshot shows a portion of an Excel spreadsheet. A cell containing the number 45 is highlighted with a pink background. To its right, a formula bar displays the formula `=SUM(B3, B4, B5, B6)`. A tooltip above the formula bar shows the result 58. The spreadsheet grid shows cells B3, B4, B5, and B6 containing the values 4, 7, 2, and 45 respectively.

58

Taichen	Rose	=CONCATENATE
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Formel: `=CONCATENATE(B4,C4)`

Taichen	Rose	TaichenRose
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Notice how it says “TaichenRose” and not “Taichen Rose” if I want the space, I need to manually type in the space. Lets break the function a little bit to understand what’s going on.

=CONCATENATE(B4, C4)

= means you are calling an excel function

CONCATENATE is the name of the excel function you called. You can read more about it [here](#).

B4 was one of the variables you adding to combine (concatenate). In our case B4 is our Taichen cell.

C4 is the same as B4, just a different object is inside of that cell. In our case it's Rose.

CONCATENATE function is doing B4 + C4, well what is Taichen + Rose? It's TaichenRose which is the output.

Now how would we get a space between TaichenRose? We add another object. Currently, there are only two objects in the above example, that is B4 (Taichen) and C4 (Rose) cell. We need to add another object between Taichen (B4) and Rose (C4). This is how we would do that.

Taichen	Rose	=CONCATENATE(B4, " ", C4)
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Output:

Taichen Rose
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You can tell there are three objects, because the comma separates each object. So B4 is an object " " is an object and C4 is an object. You add text inside of the quotations, but since we JUST wanted a space, we did empty quotes with a space. If I wanted to add another name, I could write manually in it.

Taichen	Rose	=CONCATENATE(B4, " greets ", C4)
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Output:

Taichen	Rose	Taichen greets Rose
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Now order does matter, it will concatenate B4 first, then the " greets " second, and the C4 last.

Taichen	Rose	=CONCATENATE(B4, C4, " loves cats!")
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Output:

Taichen	Rose	TaichenRose loves cats!
---------	------	-------------------------

Remember I want that space between Taichen and Rose. So I will change it to...

Taichen	Rose	=CONCATENATE(B4, " ", C4, " loves cats!")
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Output:

Taichen	Rose	Taichen Rose loves cats!
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Alright! I think we can move on to the actual Excel sheets. Looking at the NSEA 2019 sheet, let's look at one of the cells we used.

Looking at Row 4 Dakota Creek:

1	NSEA 2019 Instream Projects						
2							
3	Creek	Lat	Long	Project	Project Length (ft)	# of LWD structures installed	Improved access to unstream
4	Dakota Creek	48.9590	-122.6682	Large Woody Debris structures	500	5	

We had this as our project description:

=CONCATENATE("Installed ", G4, " ", E4, " on ", F4, " ft of ", B4)
--

Which gave us the output of..

Installed 5 Large Woody Debris structures on 500 ft of Dakota Creek
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If you study the correlation of the 8 objects in the concatenate function, you can see how it combines all text. Sometimes I had to write my own text, such as the installed or ft of, but everything else I was able to grab since it was already typed. I then copied this function next to other rows that had the same information.

That concludes this guide! Let me know if you have questions. Excel is very powerful, usually if you find yourself doing the same thing over and over, you can probably find an excel function to do it for you.

Ex: When you wanted LWD to be replaced with Large Woody Debris, instead of me manually typing that everytime I see LWD, I could use the SUBSTITUTE excel function. You can read more about that [here](#).