



Programming Any Formula in Scratch



@BOUNDISOFOUTMATH

Introduction

Do you sometimes find it exhausting plugging into the same formula and calculating using the same steps over and over? What if you could use your understanding of the formula to write a program that does that repetitive work for you? Well this lesson is about partnering your brainpower with the calculation benefits of computer programming. Let's get started :)

In science we often look at the relationship between temperatures in fahrenheit and celsius. With a quick search, we find that the formula to convert to fahrenheit is:

$$F = \frac{9}{5} C + 32$$

We're going to write a program that runs this calculation for us using the following 3 step model:

Step 1: Input Step 2: Calculate and Store Step 3: Output

1. Input

- To start, let's make variables to hold the dynamic values of both the fahrenheit and celsius.
- In Scratch we will always prompt for user input with the Ask block in the sensing menu. The answer you type in will be stored in the answer block below it, so pull both out into your script.



ask what is your name? and wait

answer

- Arrange the answer to store in the celsius variable as pictured to the right. Run your program by clicking the green flag above the stage. What happens? Also a reminder that leaving the variable checked displays its value in the stage.

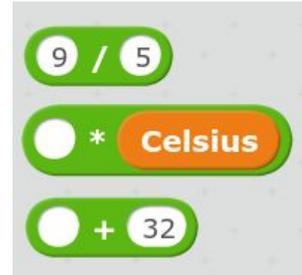




Name: _____ Per: _____

2. Calculate and Store

- a. The first step in calculating is to determine all of the operations involved and drag them into the script from the operators menu. In our formula you should notice a division, multiplication, and an addition.

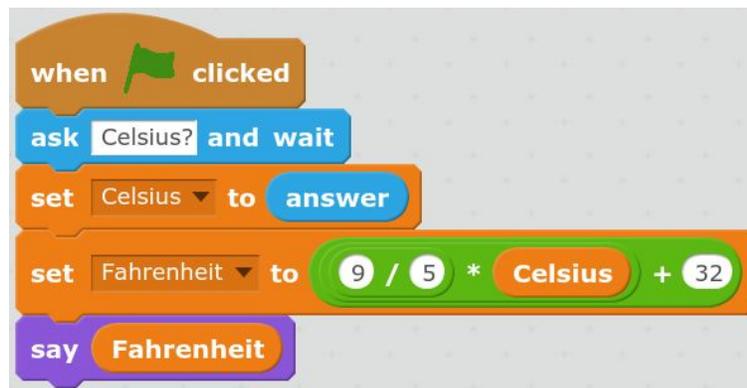


- b. Next, it's critical to decide the order of operations, or in other words what operations to drag inside first. Here we want to divide 9/5 first, multiply that result by the celsius value, and then add 32. Lastly, we want to store that calculation into the variable fahrenheit. (Hint: Notice you want to drag the left side of the block and hover in the white circle to link blocks together)



3. Output

- a. The characters, or sprites, display the output in our formula, so you want to drag the say block from the looks menu. In our formula we want to output the fahrenheit, so drag that in from the data menu and snap it in with the rest of your code.





Name: _____ Per: ____

Voila! You now have the structure by which you can program any formula you learn. Go ahead and test several examples with your program and verify that the calculations are correct. Consider that some formulas have more than one input that you may have to prompt for, but will likely have a single output.

Your Task: Find a formula you are using or have used in the recent past and write your own program! Best of luck. Onward Coding!

Get stuck here's a [video](#) :)

Want to try in [Python](#)?