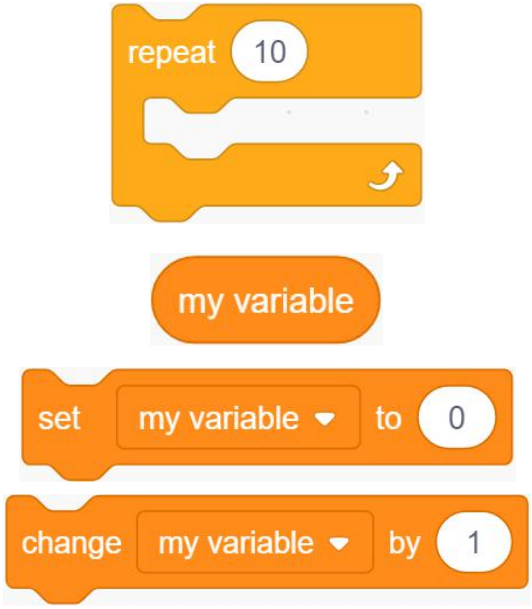
Experimental content: Realize the breathing light phenomenon by simulating pwm to produce a gradual effect

Experiment preparation： UNO board *1, Plugkit sensor expansion board *1, 4pin cable(PH2.0) *1, USB data cable *1, RGB module *1

Experimental wiring: Same as the [Light up a RGB]

Experimental steps:

1. In addition to the blocks that have been used above, we also need to find the following blocks in [Control] and [Variables]



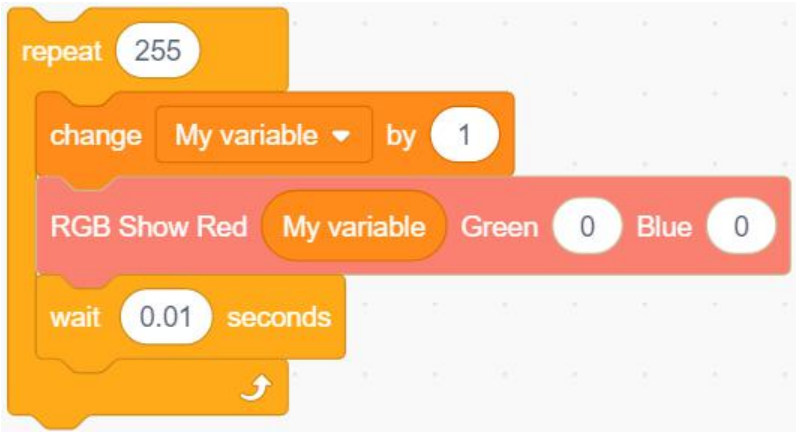
2. Put my variable block into the red value block of the RGB light module.

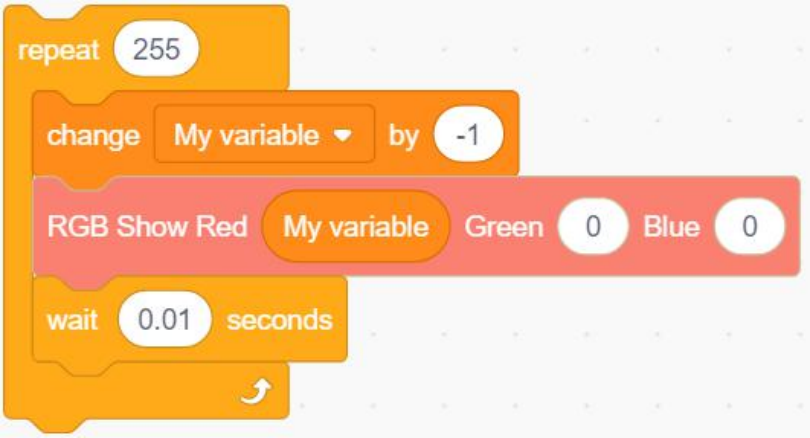
About Variable

Variable is an abstraction that can be used to store the results of a calculation or to represent a value in a computer language. A variable is the name of a storage area that a program can manipulate. We can think of variables as a box, and the program can access the data in the box at any time. Proper use of variables can greatly improve programming efficiency and increase program readability.

3. Add the "change my variable increases by 1" block, the combination of the block of step 2 and the "wait for 1 second" building block, modify the waiting 1s to 0.01s, and the waiting time is the breathing speed of the breathing light, set waiting to 0.01s, the breathing effect is more obvious.

4. In this experiment, we need to use two repeated blocks, which are executed 255 times at a time, because the RGB value of each color of the RGB lamp is 255. Each time the variable is incremented by 1 or -1. First from 0 to 255, then decrease from 255 to 0.





5. Put the two assembled blocks in the previous step in a loop block, and my variable is set to 0 in the setup initialization.

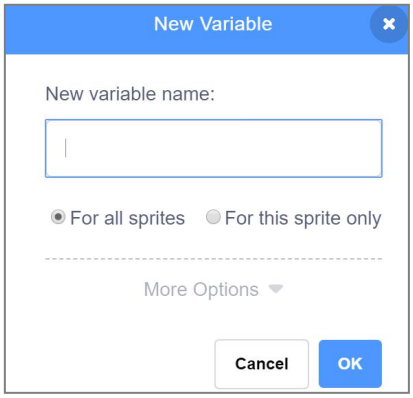
6. Compiling and uploading programs.

Experimental phenomena: RGB light module will light up red light, from the lowest to the highest brightness, then, from the highest to the lowest brightness, which achieve the effect of breathing lights.

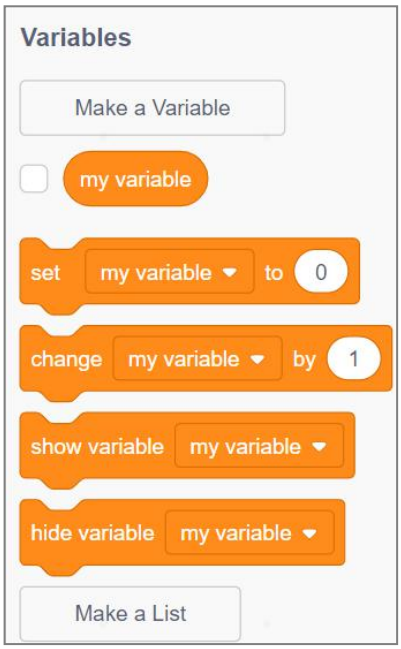
Expand: If we add another variable, we can implement the function of the breathing light with only one repeat block.

Experimental steps:

1. Create a new variable. The variable name can be customized. It can be Chinese or English. The default selection is suitable for all characters, such as, I set a variable named x, the effect of the breathing light is achieved by changing the variable x.



2. After creating a new variable, we will see an additional variable x in the variable class.

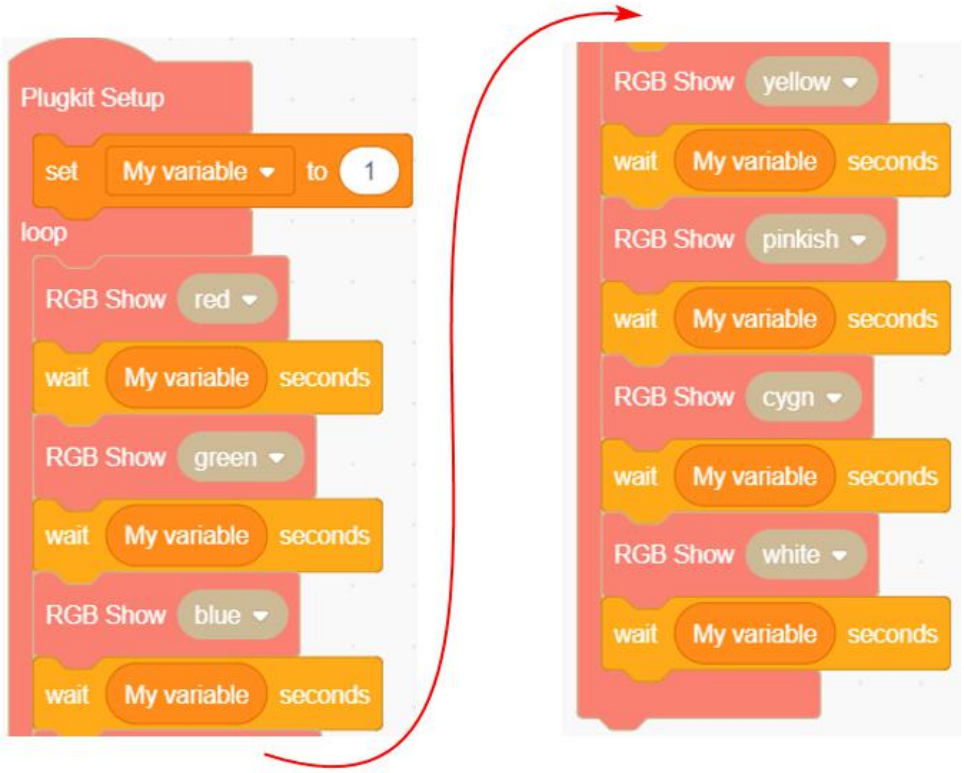


3. We need to assign a value to the variable x. Modify the parameter 0 in the "set x to 0" block to 1 and put it in the setup block, indicating that the initialization variable x is automatically added. Then, modify the parameter 0 in the "change x by -1" block to variable x. When “My variable” is greater than 254, set x to -1. When “My variable” is smaller than 1, set x to 1. We also need to use conditional judgment blocks in the [control].

4. Compiling and uploading programs.

Experimental phenomena: This program can achieve the same effect as the breathing light built with two repeat blocks.

In addition, we can also replace the parameters of the "wait for 1s" block with the [Alternating lights] with variables. As shown below.



In this case, when we need to modify the duration of the light (flashing time), we only need to modify it once during initialization, and all the times will be set to the same.

Note: Set the value of the variable block need to put into the setup block. Try to modify the value of My variable to achieve uniform control of the time interval between each color.