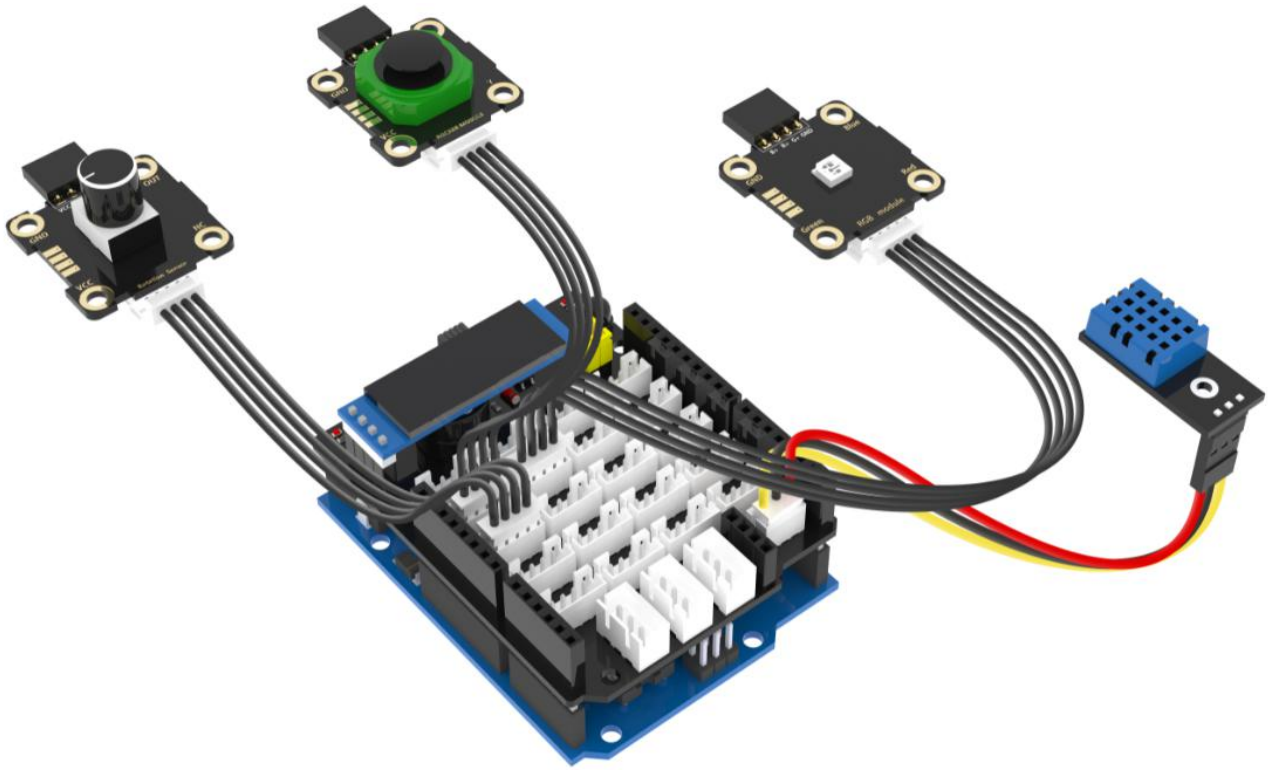
**Experimental content:** Switch the color of the light through the rocker module. There are four colors, red, green, blue, and white. The brightness of the light can be adjusted by the potentiometer module. The OLED displays the current temperature and humidity values in real time.

**Experiment preparation:** UNO board *1, Plugkit sensor expansion board *1, 4pin cable (PH2.0) * 3, 3pin cable (PH2.0) to DuPont line* 1, USB data cable *1, Potentiometer module *1, Rocker module *1, RGB light module *1, Temperature and humidity sensor module *1, 0.91 inch OLED *1

**Experimental wiring:**



RGB light module is connected to the interface of the sensor expansion board with silk screen (GND, ~11, ~10, ~9). R+: ~10, G+: ~11, B+: ~9.

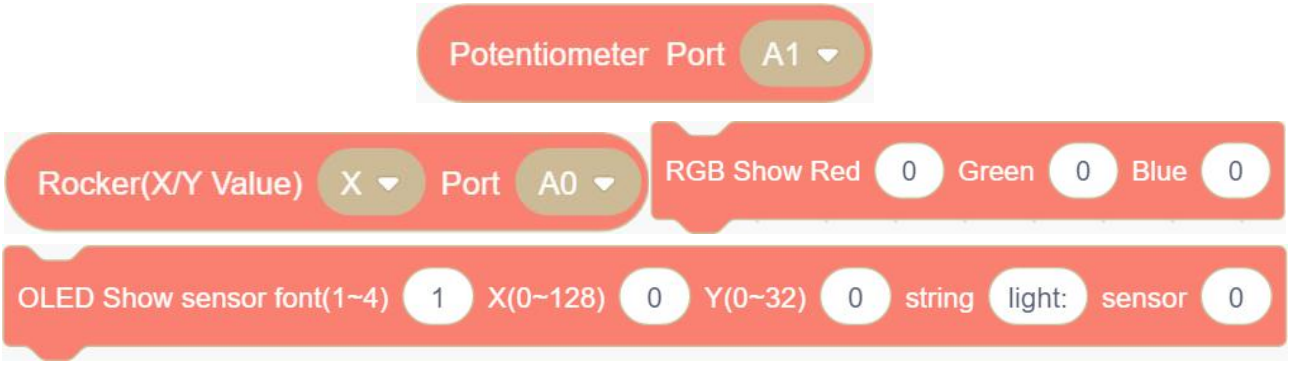
Potentiometer module is connected to the interface of the sensor expansion board with silk screen (GND, A1, A2, 5V), OUT: A1.

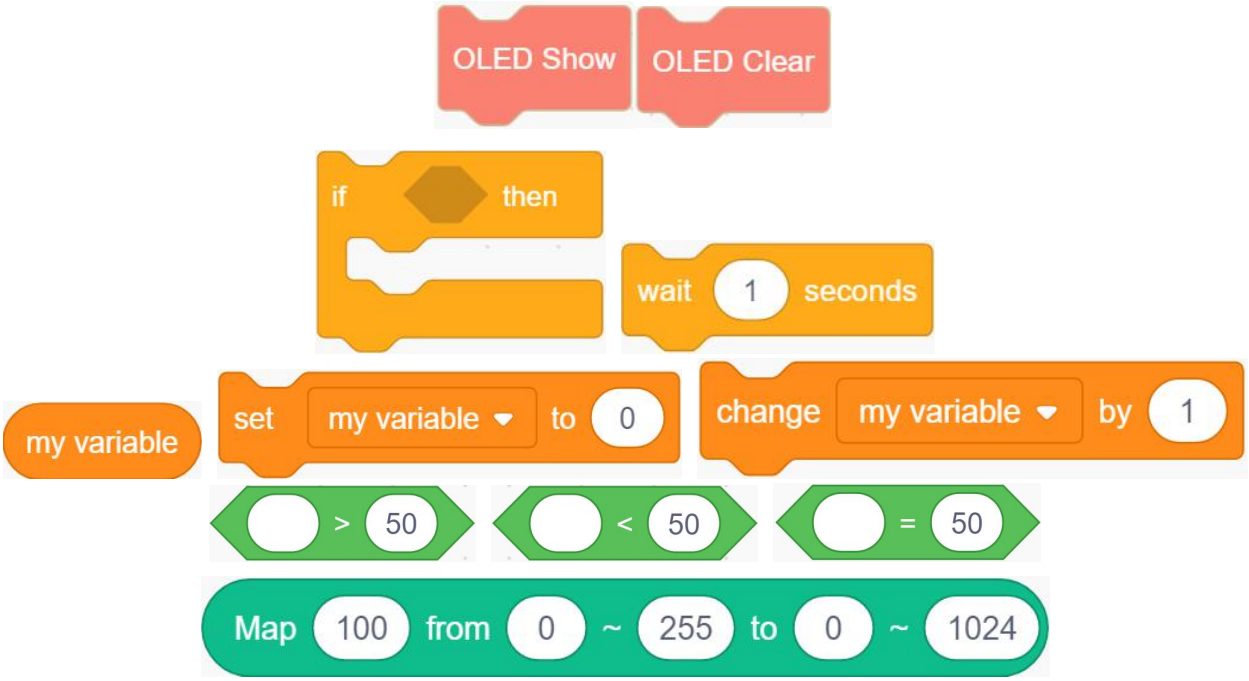
Rocker module is connected to the interface of the sensor expansion board with silk screen (GND, A0, A1, 5V). X: A1, Y: A0.

Temperature and humidity sensor module is connected to the interface of the sensor expansion board with silk screen (GND, 2, 5V). OUT: 2.

**Experimental steps:**

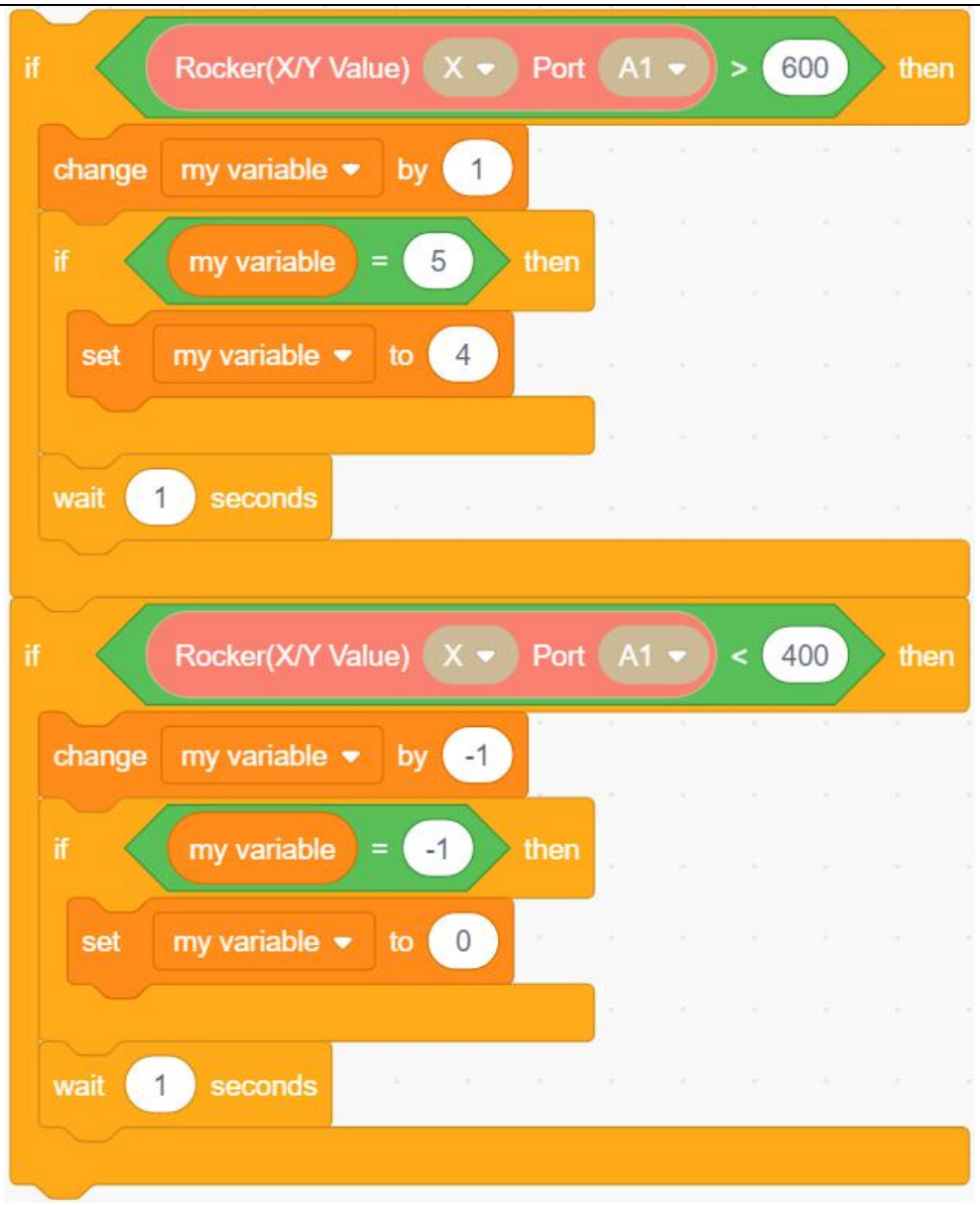
1.Select the following blocks in the [Plugkit], [Control], [Operator], [Variable], [arduino].



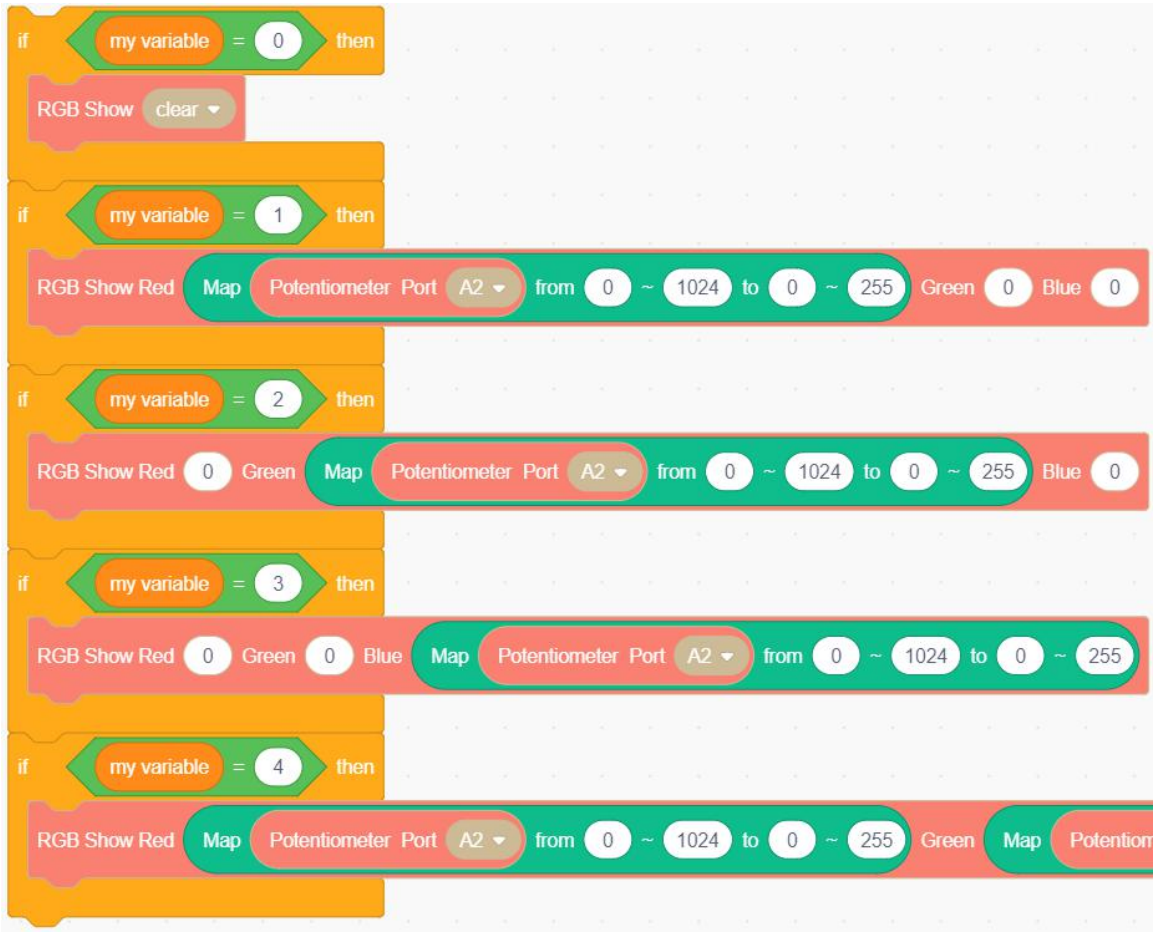



2.The rocker switches the color of the RGB light. Move the rocker X to the left to decrease the value. Move the rocker X to the right to increases the value. There are five modes corresponding to the five states.

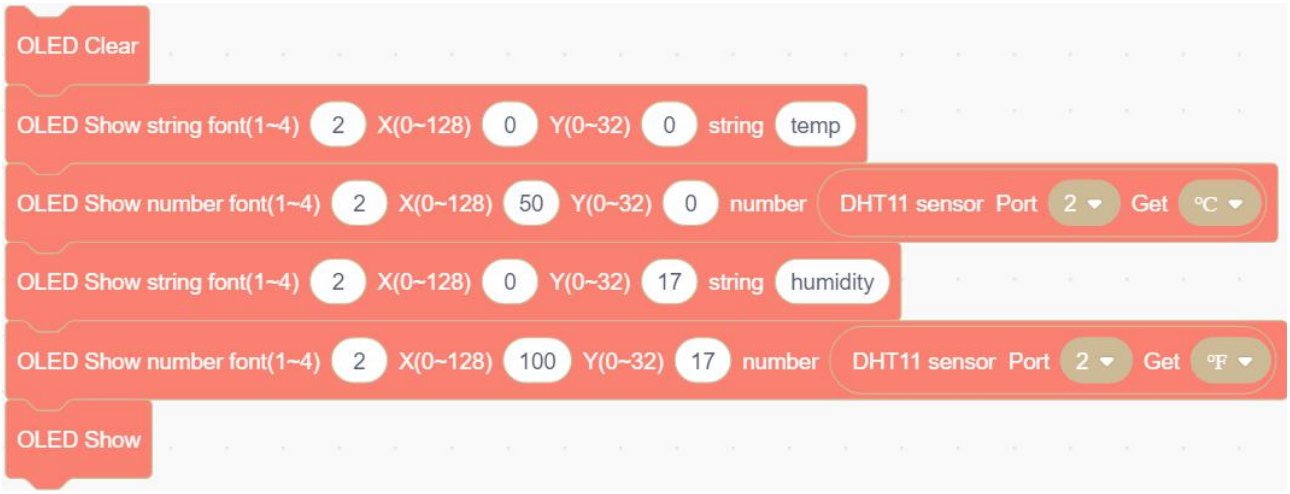
| Mode | States of light |
|---|---|
| 0 | Clear |
| 1 | Red |
| 2 | Green |
| 3 | Blue |
| 4 | White |


if
Rocker(X/Y Value) X Port A1 > 600
then
change my variable by 1
if
my variable = 5
then
set my variable to 4
wait 1 seconds
if
Rocker(X/Y Value) X Port A1 < 400
then
change my variable by -1
if
my variable = -1
then
set my variable to 0
wait 1 seconds

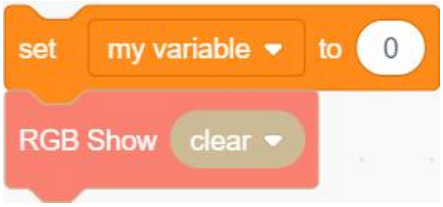
3. The potentiometer adjusts the brightness of RGB light. Turn the potentiometer counterclockwise to make the brightness of the lamp from dark to bright, turn the potentiometer clockwise to make the brightness of the lamp from bright to dark. The following figure does not show the blocks completely. For details, please see the .sb3 file provided by us.



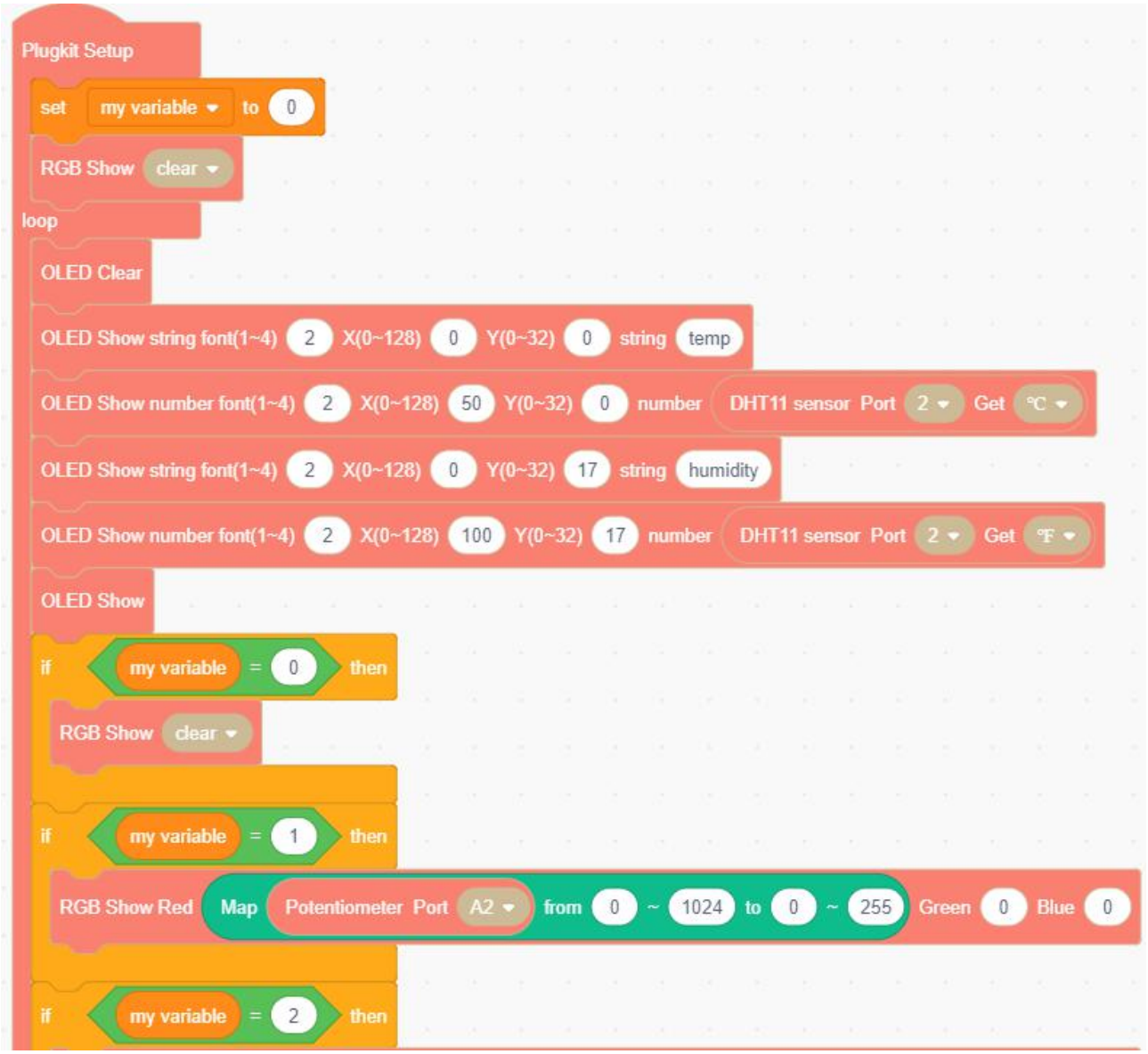

4.OLED displays the temperature and humidity values in real time. The first line of the OLED shows temp and temperature values, the second line shows humidity and humidity values, and the font size is 2.




5.In the initialization part, set variables to 0, and the RGB light show clear.

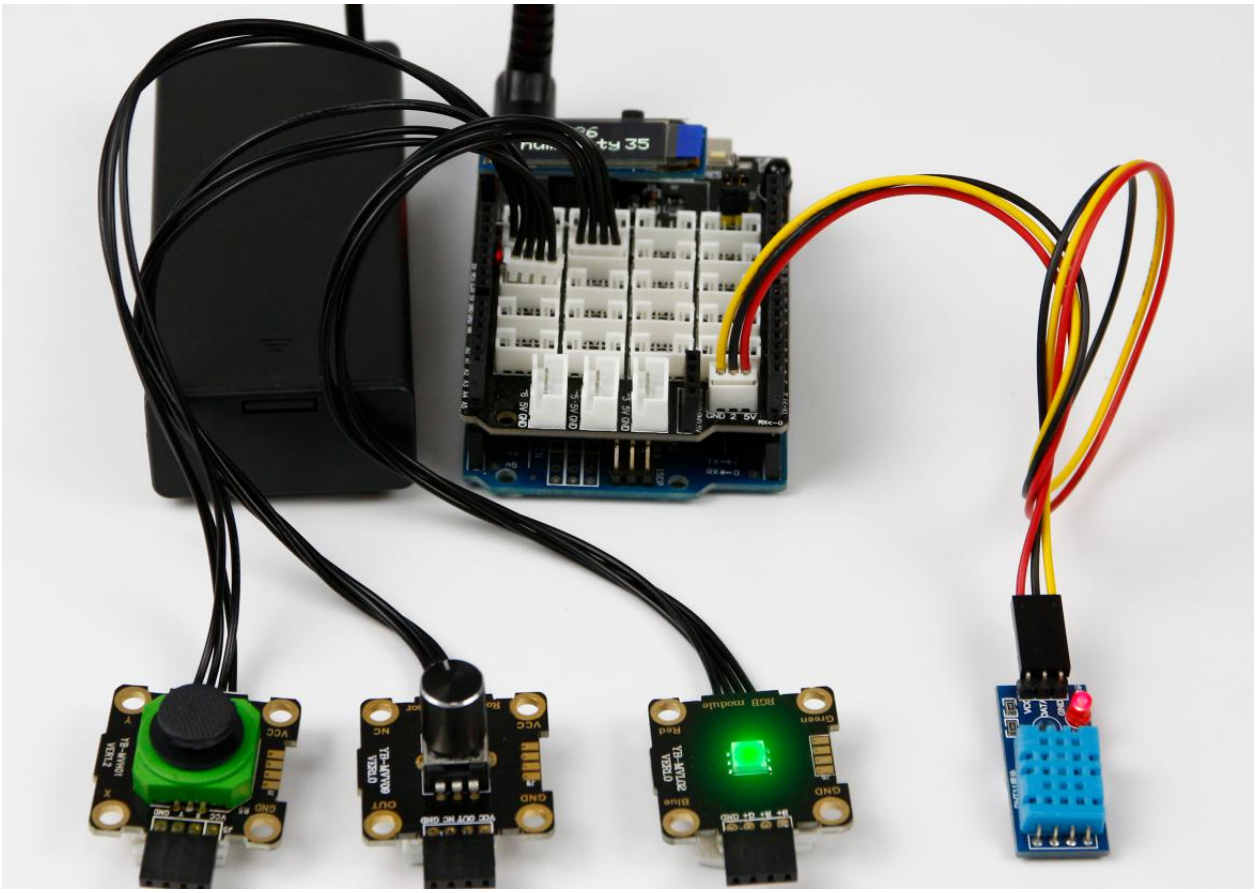



6.Put the initialization part of step 5 into the setup block, and combine the blocks of steps 2, 3, and 4 and put them in the loop block. Because the final program is too long, we only provide program step-by-step. The complete program can refer to the .sb3 file provided by us.




7.Compiling and uploading programs.

**Experimental phenomena:** The OLED displays the current temperature and humidity values in real time. The rocker module move to the left or right to switch the state of the RGB light. There are five states of the light, clear, red, green, blue, and white. The brightness of the RGB light can be adjusted by adjusting the potentiometer module.



**Expand after class**

1. Using the four button modules to realize the functions of the rocker module and the potentiometer module in this course.