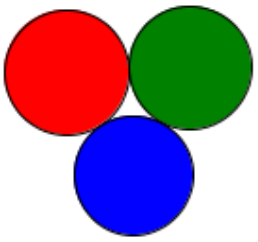
Unit 1: Getting Started with TI-Innovator™ Hub | **Skill Builder 2: Input and Color**

In this second lesson for Unit 1, you will learn about input to a program and controlling the COLOR LED on the TI-Innovator™ Hub.

Objectives:

- Use arguments to a program
- Control the COLOR LED

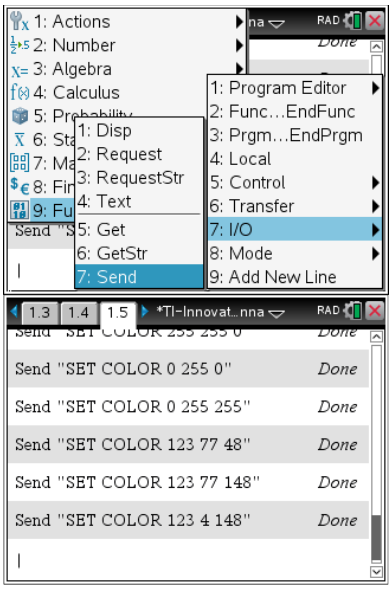


The COLOR LED (light emitting diode) has three color 'channels': red, green, and blue. This is often referred to as a, "RGB LED".

To get a particular color, you have to mix the right amounts of the three colors red, green, and blue. All other colors are possible with the right mix of these three colors.

First let's control the COLOR LED right from the Calculator app:

1. From **menu > Functions & Programs > I/O**, select the **Send** command.



2. After the keyword **Send,** type both leading and trailing quotation marks (ctrl-⊠).
3. Inside the quotation marks, type

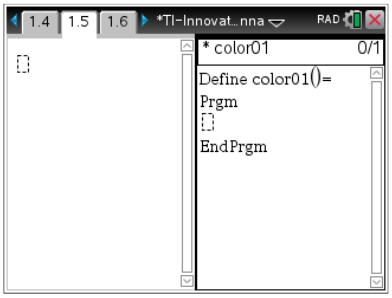
   SET COLOR

   and three numeric values separated by spaces representing the amount of red, green, and blue to light up.
   - These three numbers can be between 0 and 255. The higher the number, the brighter the color. See some examples to the right.

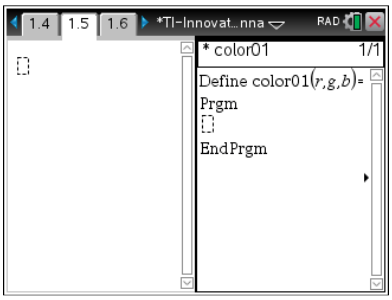
Notice that the LED stays *lit until you change it. A program can help control the LED more precisely by turning it off before the program ends.*

In the program, you will experiment with the COLOR LED. You will provide red, green, and blue values as *arguments,* and the LED will light up in the color that you chose for a few seconds and then turn off the LED.

1. To start a new program from the Calculator app, select **menu > Functions & Programs > Program Editor > New….**
2. Name the program color01.



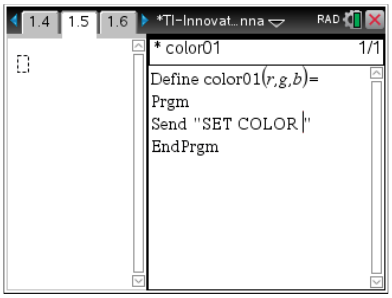
3. Inside the parentheses after the program name, type three letters separated by commas to represent the colors red, green, and blue.
   - These are called 'arguments' to the program and will be used by the program to send the three color values to the Hub.
   - We used the letters **r,g,b** on the right.



Arguments are 'placeholders' for values that you will provide when you run the program. They are variables that the programs uses to represent your actual values. These variables exist only for the program and are not available to other apps and so are treated as 'local variables'.

Setting up the Color Program

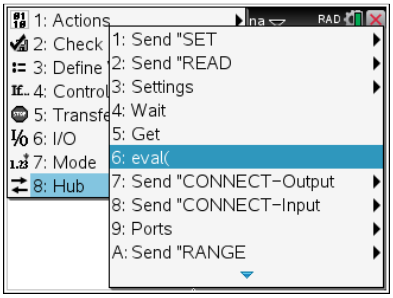
4. Select **menu > Hub > Send** "SET…>COLOR to paste the first part of the command into the program.



Understanding eval( )

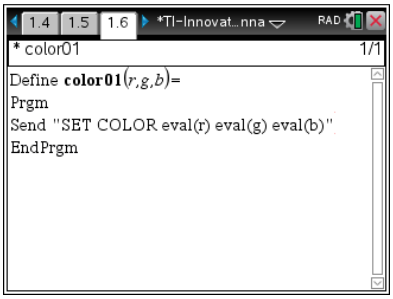
You cannot send the variables *R G B* as the color values in the **Send** statement because the *letters R*, *G,* and *B* would be sent to the TI-Innovator Hub rather than the *values* of the variables.

We need to use a special function, **eval( )** from the Hub menu which is designed to convert the value of an expression in the calculator into a string representation that the TI-Innovator Hub can process.

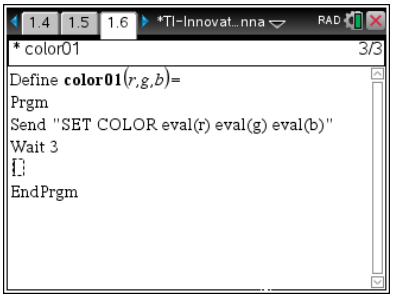


Complete the Send statement:

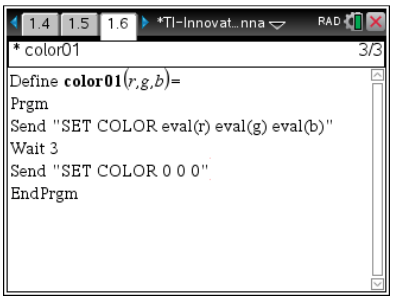
5. Add the **eval( )** function by selecting **menu > Hub** > **eval(**.
6. Type the letter *r* in the parentheses.
7. Add a space after the parentheses.
8. Repeat the **eval( )** function two more times for *g* and *b*. Don't forget to add a space in between each. The **Send** statement should look like image to the right.



9. After the **Send** statement, add a **Wait** statement to wait a few seconds. Remember to provide a number of seconds.

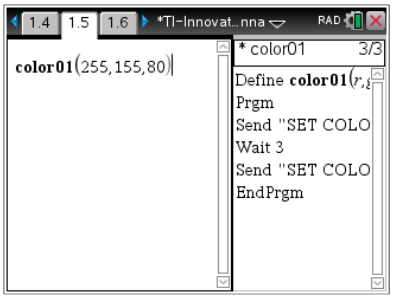


10. Finally, add another **Send** "SET COLOR … statement to turn the color LED off.
    - Use three 0's to turn off all three colors.
11. Press **ctrl-B** to check and store the program.



Run the Program:

12. With the TI-Innovator Hub connected, in the Calculator app, press var, and select the program name (or simply type the program name and a set of parentheses).
13. Inside the parentheses, provide three numbers representing the amount of red, green, and blue light to mix, and press enter.



- The color LED lights up for the number of seconds you specified in the Wait statement and then turns off.

To run the program again with different values, press the up arrow twice to highlight the program name, press enter, and edit the numbers before pressing enter again.