



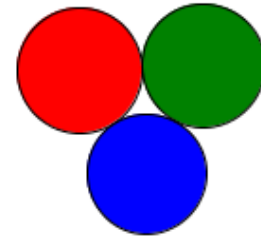
In this second lesson for Unit 1, you will learn about input to a program and controlling the COLOR LED on the TI-Innovator™ Hub.

Objectives:

- Use the **Prompt** statement and the Input statement
- Control the COLOR LED
- Use the new Program Editor **F5** menu (a%) for enhanced editing features

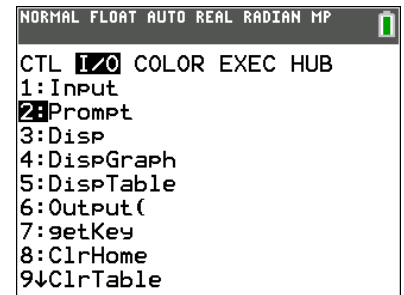
The COLOR LED (light emitting diode) has three color ‘channels’: red, green, and blue. This is often referred to as an “RGB LED”. Computer screens, phone screens and TV screens all use a large number of these LEDs to create images.

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



In this program, you will experiment with the COLOR LED. You will enter numeric red, green, and blue values into the program to direct the LED to light up in the color that you chose.

In addition to studying the COLOR LED, we are introducing the first program command to accept input from the user while the program is running: **Prompt**.



The **Prompt** statement allows the user to enter a value for a variable while the program is running. It’s called **Prompt** because it provides a visual message (the name of the variable and a question mark) when it is being processed. In response, the user enters a value for the variable.

Possible syntax of the statement:

- **Prompt** <variable>
- **Prompt** <variable1>,<variable2>,<variable3>,...

The numeric variables in the TI-84 Plus CE are the letters A..Z and Θ (theta). Real or complex numbers can be stored.

In this program, we will use Prompt to ask for red, green, and blue numeric values (0 – 255, inclusive) and then send them to the COLOR LED. In the interest of efficiency, we’ll prompt for all three variables in the one statement.



10 Minutes of Code

TI-84 PLUS CE WITH THE TI-INNOVATOR™ HUB

UNIT 1: SKILL BUILDER 2

STUDENT ACTIVITY

Setting up the COLOR Program

1. Press `[prgm]` > **New**, type a name for the program (we use the name COLOR1 here), and press **enter**.
2. Add a **ClrHome** statement by pressing `[prgm]`, arrowing to **I/O**, and selecting **ClrHome**.
3. Add a **Prompt** statement by pressing `[prgm]`, arrowing over to **I/O**, and selecting **Prompt**.
4. Add the variable R by selecting **a ***.
5. Add the variables G and B for the Green and Blue values, respectively. Be sure to add a comma between variables. Press **enter**.

```
NORMAL FLOAT AUTO REAL RADIAN MP
PROGRAM: COLOR1
:ClrHome
:Prompt R,G,B
:█
```

Now we'll use the **Send(** command to send an instruction to the TI-Innovator Hub.

6. Press `[prgm]` and arrow over to the **HUB** menu.
7. Select **Send("SET...** and then select **COLOR**.

```
NORMAL FLOAT AUTO REAL RADIAN MP
PROGRAM: COLOR1
:ClrHome
:Prompt R,G,B
:Send("SET COLOR █
```

Note: You cannot send the variables *R*, *G*, and *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

1. Add the **eval(** function by pressing `[prgm]`, arrowing over to the **HUB** menu, and selecting **eval(**.
2. Type the letter R and the right parenthesis.
3. Add a space (a.0).
4. Repeat the **eval(** function two more times for G and B. Don't forget to add a space in between.
5. Finally, after the third **eval(** function, add the closing quotation mark for the string and the right parenthesis for the **Send(** command.

```
NORMAL FLOAT AUTO REAL RADIAN MP
CTL I/O COLOR EXEC HUB
1:Send("SET...
2:Send("READ...
3:Settings...
4:Wait
5:Get(
6:eval(
7:Send("CONNECT-Output...
8:Send("CONNECT-Input...
9↓Ports...
```

The completed statement will be:

Send("SET COLOR eval(R) eval(G) eval(B)")

```
NORMAL FLOAT AUTO REAL RADIAN MP
PROGRAM: COLOR1
:ClrHome
:Prompt R,G,B
:Send("SET COLOR eval(R) e
val(G) eval(B)")
```



10 Minutes of Code

TI-84 PLUS CE WITH THE TI-INNOVATOR™ HUB

Running the Program

Make sure the TI-Innovator Hub is connected to the calculator.

To run a program from the Program Editor:

1. Press **a** $\%$, which is the **F5*** key.
2. Select **Execute Program**.

This sequence of steps quits the Program Editor and runs the program on the home screen.

3. You will get three prompts on a cleared home screen, one for R, one for G, and one for B.
4. Enter numbers between 0 and 255, inclusive, for each variable, pressing enter each time.
5. After entering the third value, notice the color of the COLOR LED on the TI-Innovator Hub.

To try a different set of values, press **e** to rerun the program, and enter three new values.

UNIT 1: SKILL BUILDER 2

STUDENT ACTIVITY

