Unit 1: Getting Started with TI-Innovator™ Hub	Skill Builder 1: Your First Program

In this first lesson for Unit 1, you will learn about working in the Program Editor to write a program that controls a light on the TI-Innovator™ Hub.

Objectives:

- Use the TI-84 Plus CE Program Editor
- Use the **Send(** command to control a light on the TI-Innovator Hub
- Introduction to the **Wait** statement
- Timing on the TI-Innovator Hub and the calculator

Connect the TI-Innovator Hub to the TI-84 Plus CE. The calculator will turn on. On the TI-Innovator Hub, a green light illuminates, indicating that the TI-Innovator Hub has power and is ready.

When learning to program a calculator with the TI-Innovator Hub, you will be learning to program in two separate but connected worlds: the calculator and the TI-Innovator Hub.

When writing a program on the calculator, use the [prgm] key to paste commands into the program.

- The **Send(** command is used to send commands to the TI-Innovator Hub that produce a physical reaction (lighting up a light, making a sound, turning on a motor, etc.).

- The TI-Innovator Hub commands are also found in the [prgm] key under the **HUB** menu.

Setting up the LIGHT Program

Your first program will tell the TI-Innovator Hub to turn on the red LIGHT (LED) for 5 seconds.

1. To begin writing a new program, press [prgm] **> New**.

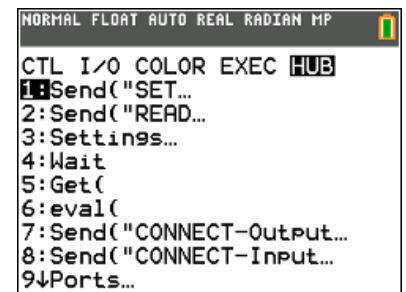2. Type a name for the program (we use the name LIGHT1 here), and press **enter**.
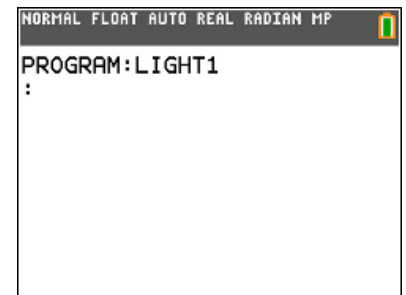
Your program will consist of only one line of code:

Send("SET LIGHT ON TIME 5")

LIGHT is the name of the red LED.

To create this statement:

3. Press the [prgm] key, and select the **HUB** menu.

4. Select the **Send("SET…** menu item.

5. Then, select **LIGHT** from the **Send "SET** submenu.

6. Finish the statement by completing the rest of the command.

   - To access **ON** and **TIME**, press the ⌈prgm⌉ key, select the **HUB** menu, and then select the **Settings** submenu.

   - Enter the number **5** for 5 seconds.
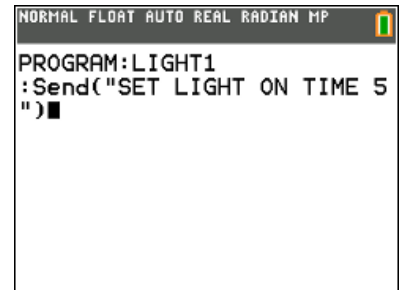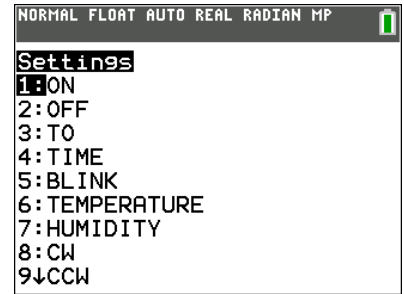
Send("SET LIGHT ON TIME 5")

Don't forget to close the quotation marks (⌈alpha⌉ +) and parentheses at the end of the statement. If needed, the space character is on the 0 (zero) key.

The complete program is shown to the right.

The **Send**( ) command will send the *string* (the text in quotes) to the TI-Innovator Hub.

Running the Program

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

2. Press a % (**F5***), and then e to select 'Execute Program'. This quits the Program Editor and runs the program on the home screen.

   ** The **F5** MENU key, first included in OS v5.3, is only available from within the Program Editor. It contains some additional useful editing tools like Undo Clear, Cut, Copy, and Paste, and more. These are very handy new features that you will appreciate as you write more complex programs.*
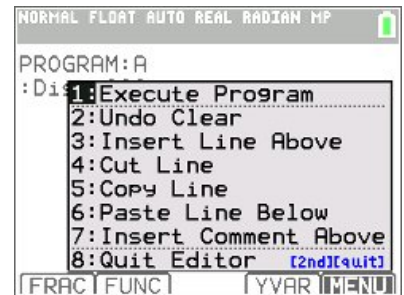
If the command is written correctly, the LIGHT (the red LED) will light up for 5 seconds. If there's an error in the TI-Innovator Hub instruction, the red light flashes once and a beep will sound.

The calculator displays 'Done' when the program ends. Notice that the program actually ends before the light goes off. To make the program end when the light goes off, we have to tell the calculator to **Wait** as long as the light is on.

To add a statement to the program, we need to edit it.
1. Press ⌈prgm⌉ and arrow over to **EDIT**.

2. Select your program name from the list.

3. Arrow down to the end of the program code.

4. Press ⌈enter⌉ to add a new line.

5. Add the statement **Wait 5** by pressing ⌈prgm⌉, arrowing down to **Wait** in the **CTL** menu, and pressing **enter**. Then, enter the number **5**.

Run the program again. If the program was the last item on the home screen, simply press ⌈enter⌉ to rerun it. The program will end at roughly the same time the red light goes off.

Extensions

We can remove the **TIME** element of the Send instruction and control the timing using the **Wait** command in the calculator. Since the LED will stay on once it is turned on, you will also have to turn the light **OFF** in your program.

- To turn the light off, use the statement:

  Send("SET LIGHT OFF")

- Add statements to the program to make the light blink many times.

```
NORMAL FLOAT AUTO REAL RADIAN MP
PROGRAM:LIGHT1
:Send("SET LIGHT ON")
:Wait 1
:Send("SET LIGHT OFF")
:Wait 1
:
:
:
:
:█
```