



Unit 7: The TI-RGB Array

Skill Builder 2: A Rainbow of Color

In this lesson, you will generate random colors on each of the LEDs on the TI-RGB Array.

Objectives:

- Use getKey to end a program
- Use randInt() to light a random LED in a random color

We will use the random number generator **randInt()** to make random LEDs light up in random colors.

1. Start a new program - we called it **RAINBOW** - and add

Send("CONNECT RGB")

Using **prgm > HUB > Send("CONNECT-Output...** and select **RGB** from the next menu.

Type the closing quote and parenthesis.

2. Add a **While... End** loop using **prgm > While** and press **[enter]** a few times, then select **prgm > End** for the end of the loop structure.

3. The loop will end when the **[clear]** key is pressed. The condition is:

While getKey ≠ 45

getKey is found on **prgm > I/O**

≠ is found on **[2nd] [math]** (the test menu)

45 is the code for the **[clear]** key since it is on row 4, column 5 of the keypad.

```
NORMAL FLOAT AUTO REAL RADIAN MP
EDIT MENU: [a1pha] [f5]
PROGRAM: RAINBOW
:Send("CONNECT RGB ")
```

```
NORMAL FLOAT AUTO REAL RADIAN MP
EDIT MENU: [a1pha] [f5]
PROGRAM: RAINBOW
:
:Send("CONNECT RGB ")
:While
:
:
:End
:
```

```
NORMAL FLOAT AUTO REAL RADIAN MP
EDIT MENU: [a1pha] [f5]
PROGRAM: RAINBOW
:
:Send("CONNECT RGB ")
:While getKey≠45
:
:
:End
:
```

Teacher Tip: If you prefer 'press any key' to terminate the program use:

While getKey=0

Caution: rapidly flashing lights may be disturbing for some students, so it is wise to use Wait statements to slow things down a bit.

4. In the loop body write four statements to assign random integers to four variables L, R, G, and B representing the LED number and the red, green, and blue values for that LED:

randInt(0, 15)→L

randInt(0, 255)→R

randInt(0, 255)→G

randInt(0, 255)→B

```
NORMAL FLOAT AUTO REAL RADIAN MP
EDIT MENU: [a1pha] [f5]
PROGRAM: RAINBOW
:
:Send("CONNECT RGB ")
:While getKey≠45
:randInt(0,15)→L
:randInt(0,255)→R
:randInt(0,255)→G
:randInt(0,255)→B
:
:End
```



10 Minutes of Code

TI-84 PLUS CE™ WITH TI-INNOVATOR™ AND TI-RGB ARRAY™

UNIT 7: SKILL BUILDER 2

TEACHER NOTES

5. Add the **Send**(statement to control one of the TI-RGB Array LEDs:

Send("SET RGB eval(L) eval(R) eval(G) eval(B)")

and a **Wait** statement to slow the lights down:

Wait .25

6. Run the program to see a wide variety of colors blinking.

Press **[clear]** to stop the program. Notice that the LEDs are still lit even though the program has ended. Fix this by turning them off just after the **End** of the **While** loop statement by adding the statement:

End

Send "SET RGB ALL 0 0 0"

```
NORMAL FLOAT AUTO REAL RADIAN MP
EDIT MENU: [alpha] [f5]

PROGRAM: RAINBOW
:While getKey≠45
:randInt(0,15)→L
:randInt(0,255)→R
:randInt(0,255)→G
:randInt(0,255)→B
:Send("SET RGB eval(L) eval(R) eval(G) eval(B)")
:Wait .25
:End
```





In the Stat Editor, create three lists, RED, GREEN, and BLUE.

Refresher: To customize the Stat Editor:

Place your cursor in the upper left corner of the editor (usually this is L1).

Press [ins] (2nd-del) and type the name of the new list and press [enter].

In each row, enter the values that make up the rainbow's colors (indigo is left for you to determine):

[illegible]

Modify the rainbow() program to select random colors from these lists:

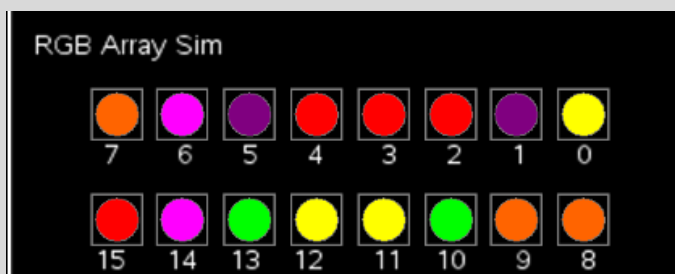
randInt(1,7)→C in place of the three randint(0,255) statements

Send "SET RGB eval(L) eval(LRED(C)) eval(LGREEN(C)) eval(LBLUE(C))"

Select the names of the lists from the **2nd stat > NAMES** menu

```
NORMAL FLOAT AUTO REAL RADIAN MP
EDIT MENU: [a]PhaJ [f5]

PROGRAM: ROYGBIV
:While getKey#45
:randInt(0,15)→L
:randInt(1,7)→C
:Send("SET RGB eval(L) eval(C) eval(LGREEN(C)) eval(LBLUE(C))")
:Wait .25
:End
:Send("SET RGB ALL 0 0 0")
```



Much more colorful!