



In this first lesson for Unit 2, you will learn about the **For** loop in the calculator through a program that makes the LED light blink while displaying information on the calculator screen.

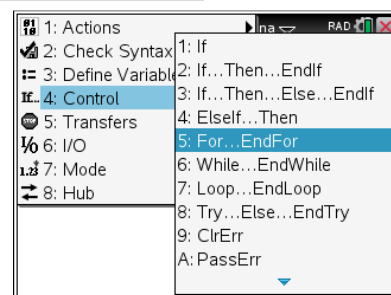
Objectives:

- Learn about the **For** loop
- Make the light blink
- Use the **Disp** statement for text and variables

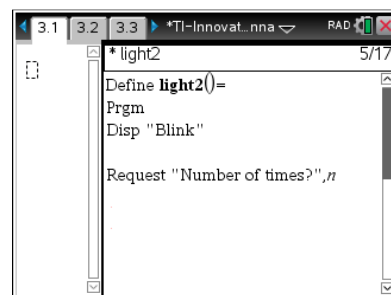
Teacher Tip: There are three kinds of loops in the TI-Nspire™ CX TI-Basic language: **For**, **While**, and **Loop**. Each requires a corresponding **End...** at the bottom of the loop body. **EndFor** refers to the end of the **For** loop structure, etc. The keyword **Stop** refers to the end of a program. The keyword **Exit** will pass control to the first statement below the end of a loop and the keyword **Cycle** jumps to the beginning of the loop. We try to avoid these two sloppy statements but **Exit** is necessary to get out of the **Loop...EndLoop** structure.

Let's write a program to make the LED light blink a certain number of times. With other input statements (or arguments) you can also control the amount of time that the light is on and off.

This program introduces you to the **For...EndFor** loop.

**Setting up the program:**

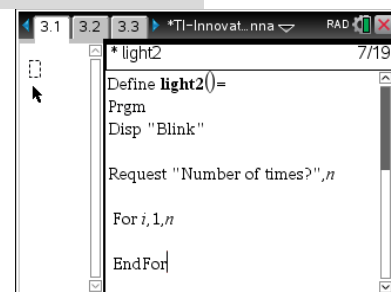
1. Start a new program, and call it LIGHT2.
2. Add **Disp** by selecting **menu > I/O** and selecting **1:Disp**.
3. Within quotation marks, add the text "Blink" as shown.
4. Add **Request** by selecting **menu > I/O > 1:Request**.
5. Within quotation marks, add the text "Number of times?" as shown.
6. Add a comma and the variable *n*.



Teacher Tip: The **For** loop requires **For var, start, finish, <step>** and **EndFor** at the bottom. The loop body iterates automatically as the loop variable takes on values from the start value to the finish value. The default *step* value is 1 if no step value is specified. At the end of the loop, the *var* is one increment higher than finish, so if the loop goes from 1 to 10, *var* is 11 after the loop ends.

Adding the For Loop:

7. Add the **For** structure by selecting **menu > I/O > 5:For...EndFor**.
 - Both the **For** , , statement and the **EndFor** statements are pasted into your program with a line between them to add the loop body.
8. Add the rest of the **For** statement's pieces, **i,1,n**, between the commas provided.
 - This statement means "For *i* going from 1 to *n* by ones."





10 Minutes of Code

TI-NSPIRE CX WITH THE TI-INNOVATOR™ HUB

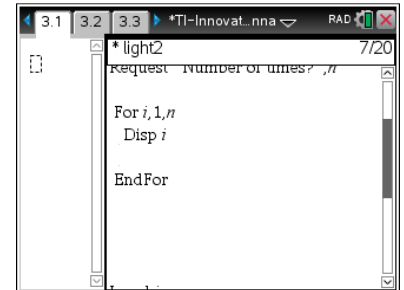
UNIT 2: SKILL BUILDER 1

TEACHER NOTES

9. Press enter a few times in the loop body to create blank lines that we'll fill in next.
 - Don't worry about how many blank lines to enter. You can always add more lines if you need them, and blank lines have no effect when you run the program.
 - The block of statements between For and EndFor is called the 'loop body'. It is this section of code that will be processed N times thanks to the work done by the **For** loop.

We want the light to blink *ON* and *OFF* **N** times. We also want the calculator to display the number of the blink.

We'll start the loop body with **Disp I**, the loop control variable.

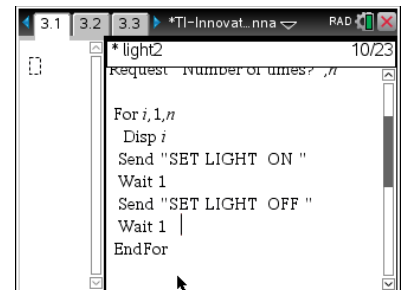


```
*light2
request "Number of times?",N

For i,1,N
  Disp i
EndFor
```

We now add statements to turn the light ON and OFF as shown.

10. Add **Send** "SET LIGHT" from the **HUB** menu.
11. Add the word **ON** from the **HUB > SETTINGS** menu (or just type it).
12. Add **Wait** (in seconds) from the **HUB** menu so that the calculator waits before sending the next command.
 - In our program, we use 1 second, but you can use any values you like, including decimals.
13. Add another **Send** statement to turn the light OFF, and then add another **Wait** statement.
14. Store the program (**ctrl-B**), and run the program in the Calculator app.



```
*light2
request "Number of times?",N

For i,1,N
  Disp i
  Send "SET LIGHT ON "
  Wait 1
  Send "SET LIGHT OFF "
  Wait 1
EndFor
```

Notice the indenting? This helps to make programs more readable and has no effect on the running of the program.

Here's a challenge: Add more input statements at the top of the program (before the **For** statement) to set the timings for the two **Wait** values, and use those variables instead of numbers in these statements.

Quit and run the program again. Observe the blinking and the values displayed on the calculator screen.