1. Checking Functions

■ Run the demo program.

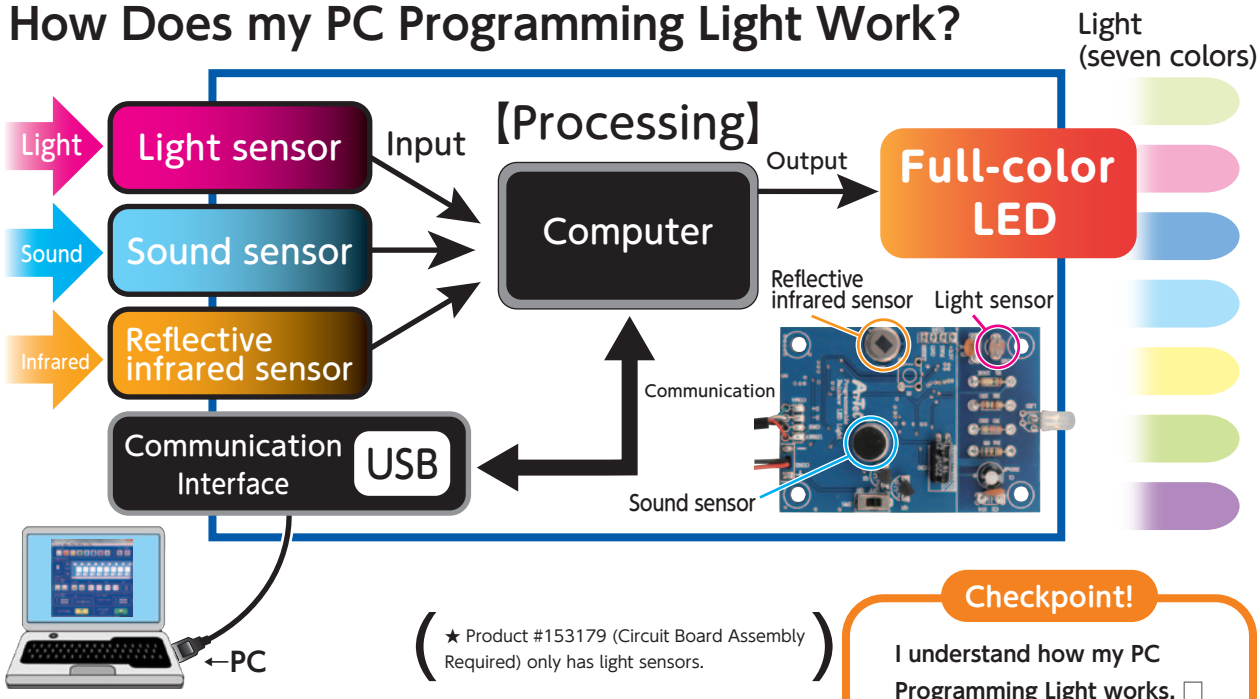
The main body is pre-set with a demo program. Correctly insert three AA size batteries in the battery holder and turn the switch on. Verify that the LED on the main body illuminates in order of red, green and blue for 1 second each.

If the demo program does not run, check if you've soldered the parts correctly. Also make sure the batteries are inserted in the correct polarity.

Checkpoint!

I ran the demo program! ☐

2. How Does my PC Programming Light Work?



(★ Product #153179 (Circuit Board Assembly Required) only has light sensors.)

Checkpoint!

I understand how my PC Programming Light works. ☐

■ Let's think about what type of sensors are used in home appliances around you.

What kind of sensors?	In what appliances?	How are they used?

3. Let's Use the Programming LED Light Software!

■ Installing the Programming LED Light software from a CD-ROM

Insert the CD-ROM into your computer's CD/DVD drive. Access the CD/DVD drive from My Computer, then drag and drop the "Programmable LED Light" icon onto the desktop.

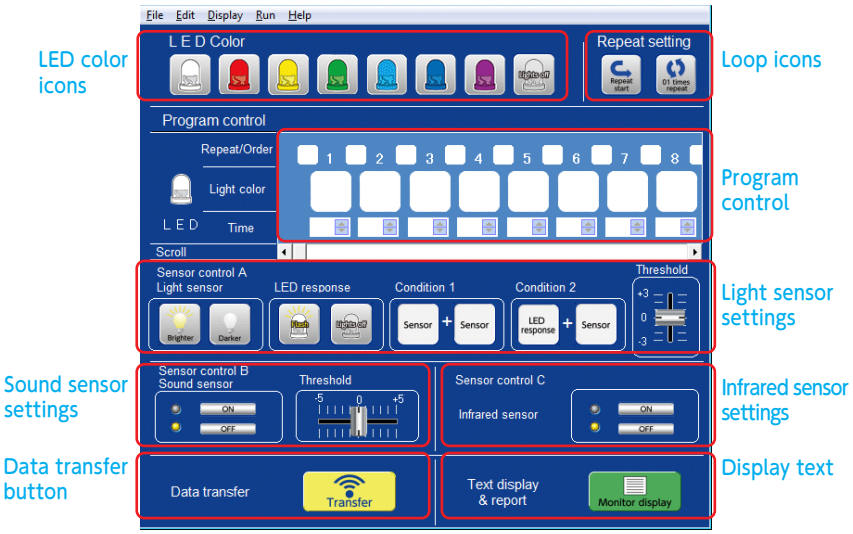
■ Installing the Programming LED Light software from our homepage

Go to our website (http://www.artec-kk.co.jp/en/pll) and download "Programming LED Light Software" to your desktop.

■ Double-click the "Programmable LED Light" icon to launch the software.

Screen Overview

The picture to the right shows the screen where you make your program.
To create a program, drag and drop LED Color and Repeat icons into the Program Area.
Up to 24 icons can be placed.
The icons you chose will run in order, starting with number 1.
Data is transferred to the main unit of your Programmable LED Light when you click the Transfer button.
You can use Light, Sound, and Reflective Infrared Sensor settings to incorporate them into your program. Click the Monitor Display button to view and print out the text of your program.



■ Connect to Your PC to Check Software

Connect your PC Programming Light unit to your PC's USB port. Check to see if a yellow icon appears on the bottom left of your software screen. Seeing the message "Connect the main body to your PC" means your PC Programming Light hasn't been detected. Be sure to check the following:

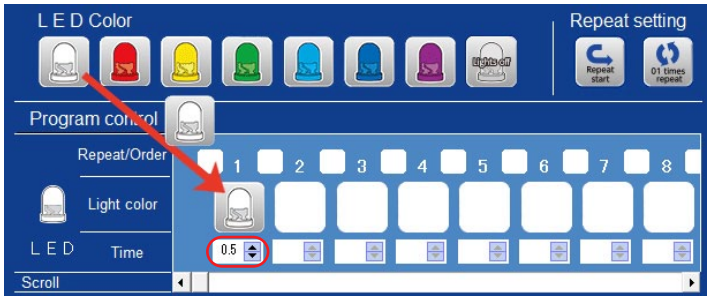
Is your device driver properly installed?
The first time you connect your board it make take some time for your PC to detect it. Check the Assembly Instructions for details about installing your USB device driver.

Checkpoint!
My PC recognizes the unit. ☐

■ Making a Program

Place LED Icons in the Light Color row to set the colors you want to use.
In the Time row you can set the duration of the flash from 0.5 to 9.5 seconds.
If you want your program to loop, drag a Repeat Start icon into a box of the Repeat/Order row.

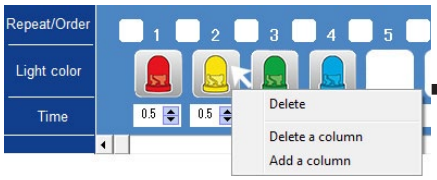
Now let's make a program! When you drag an LED Color icon into the first row it's duration will automatically be set as 0.5 seconds.



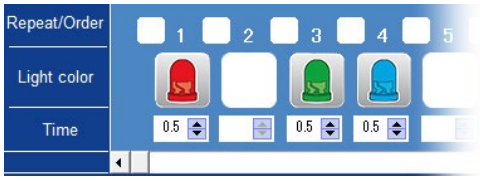
Checkpoint!
I've placed icons in the Program Area. ☐

■ Editing Icons

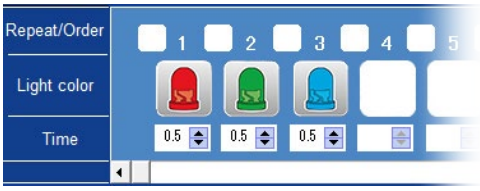
Right-click on the icon you want to change to bring up the Edit menu.



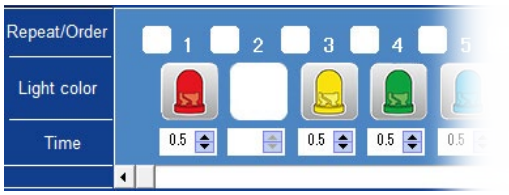
Delete
(Removes an icon.)



Delete a Column
(Removes a column, pulling the remaining ones to the left.)



Add a Column
(Inserts a new column in between two existing ones.)

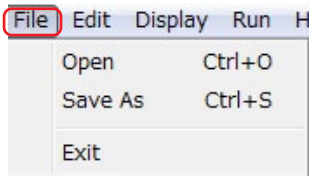


■ Useful Features

"File" > "Open":
Open data you've saved.

"File" > "Save As":
Save any programs you've created.

"Edit" > "Reset":a
Deletes all previously set icons and data.



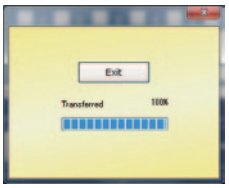
Checkpoint!
I now know how to edit icons. ☐

Checkpoint!
I now know about useful features. ☐

■ Transferring and Running Programs

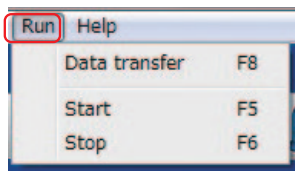
① You'll need to transfer your finished program from the Programming LED Light software to the unit.

② Clicking Transfer will transfer your program to the unit. Click Exit when the transfer completes.

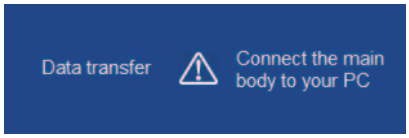


③ Select Start from the Run menu and the program will run.
(You can also press F5 on your keyboard to run the program.)

Select Stop from the Run menu to stop the program.
(You can also press F6 on your keyboard to stop the program.)

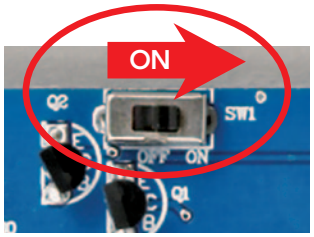


④ If you see the message "Connect the main body to your PC," check to see whether the USB device driver has been properly installed.



■ Powering the PC Programming Light

When using battery power, turn your unit ON to start your program.
Your unit is powered automatically when connected to a PC, even when the switch is set to OFF.
Connecting the unit to your PC when the Control Software is already running will stop the program running on your unit as it waits for input from the software.

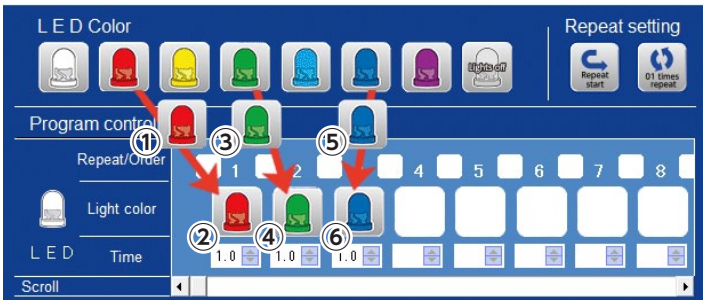


4. Programming Sequences

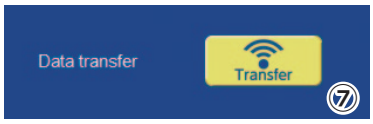
■ Tip

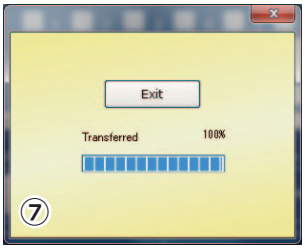
Ex: You can program the LED Light software like the demo program below.

(1) Drag and drop the red LED icon into space 1.
(2) Set the number under the red LED icon to 1.0 sec.
(3) Drag and drop the green LED icon into space 2.
(4) Set the number under the green LED icon to 1.0 sec.
(5) Drag and drop the blue LED icon to space 3.
(6) Set the number under the blue LED icon to 1.0 sec.

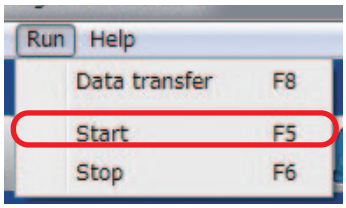


(7) Click the Transfer button to transfer your program to the unit. Once the program has transferred, click Exit.



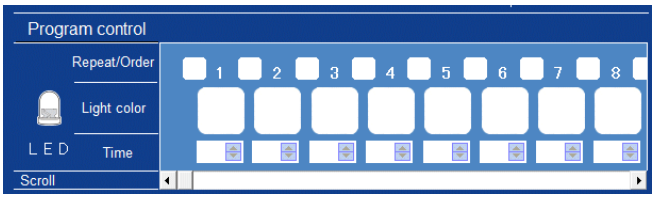


(8) Select Start from the Run menu and your program will run.



■ Sequential Program 1

Make a program that flashes your LED red for 1 second!

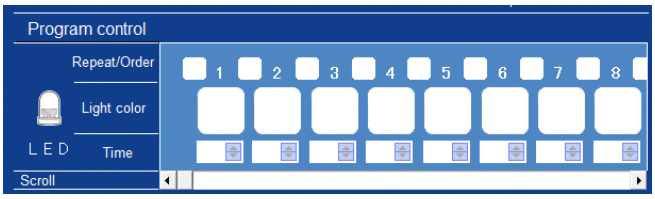


Checkpoint!

I ran sequential program 1! ☐

■ Sequential Program 2

Now make the LED flash red, green, blue, yellow, light blue, purple, and white for 1 second each!

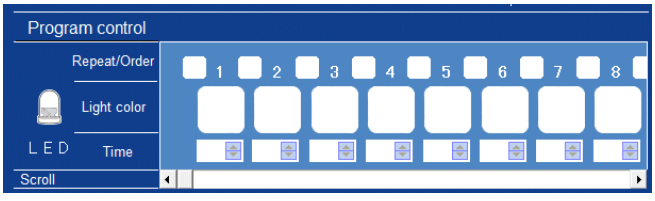


Checkpoint!

I ran sequential program 2! ☐

■ Sequential Program 3

Now set any colors in any order you want to flash for any amount of time!



Checkpoint!

I ran sequential program 3! ☐

5. Programming Repeats

■ Checkpoint!

You can use Repeat Icons to loop some or all of the LED Icons you've placed in your program.

Example:

(1) Drag and drop a red LED icon into space 1.
Drag and drop a yellow LED icon into space 2, green into space 3, light blue into space 4, and blue into space 5.

(2) Drag and drop a Repeat Start icon into the 2nd space of the Repeat/Order row.

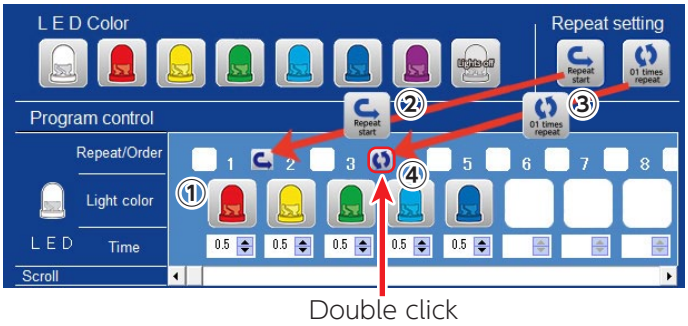
(3) Drag the 01 Times Repeat icon to the 4th space in the Repeat/Order row and drop it.

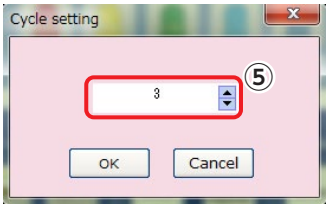
(4) Double click the 01 Times Repeat icon to bring up a settings window.

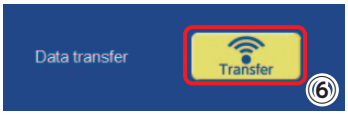
(5) Use the arrows to set the number of repeats to 3.

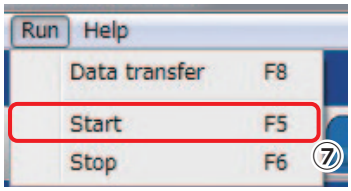
(6) Click Transfer to transfer your program.

(7) Select Start from the Run menu and your program will run.









The demo program will run in this order:
"1→2→3→4→2→3→4→2→3→4→5"

Choosing Continuous in the Cycle Setting window will make the selected section loop forever.

■ Looping Program 1

Without using the Repeat icons, program your LED to flash yellow, light blue, purple, yellow, light blue, purple, yellow, light blue, purple, yellow, light blue and purple.

Checkpoint!

I ran looping program 1!

☐

■ Looping Program 2

Using the Repeat icons, program your LED to flash a sequence of yellow, light blue and purple four times!

Checkpoint!

I ran looping program 2!

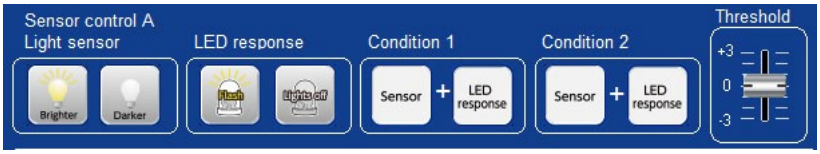
☐

6. Using Sensors Program

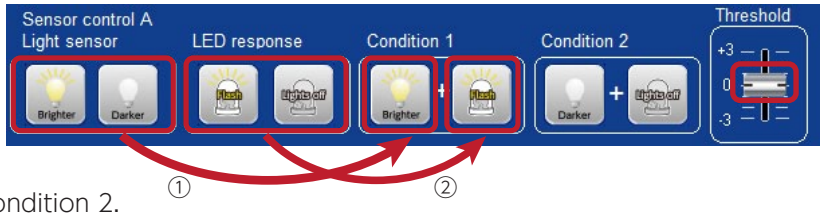
You can program the signals that react to light and sound from the 3 sensors on the PC Programming Light body. Transferring your program to the main body and clicking Start under the Run menu will cause your sensors to go into standby mode. Your program will run once the sensor response conditions you've set have been met. Signals from sensors will be disabled while the program is running. The sensors will return to standby mode once your program has finished running. If you have made settings for multiple sensors, your program will start when the response conditions for any one of those sensors have been met.

■ How to Use Light Sensors

① Drag a **Brighter** or **Darker** icon into the Sensor box of Condition 1. This will automatically place the opposite icon in the Sensor box of Condition 2.



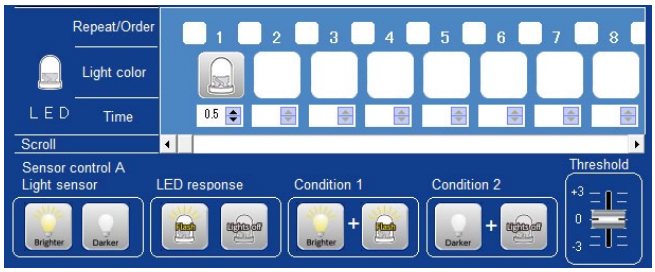
② Drag a **Flash** or **Lights Off** icon into the LED Response box of Condition 1. This will automatically place the opposite icon in the LED Response box of Condition 2.



Set the threshold of the icons by dragging the Threshold slider. The higher the value, the brighter the light will need to be for your program to respond. Remove icons from Condition boxes by right clicking the icon and choosing **Delete**. The picture above shows a program that will start in response to any brightness level higher than 0.

■ A Light Sensor Program

Now make a program that makes the LED flash white if you cover the Light Sensor with your hand.
Try adjusting the sensor threshold and see how it changes!

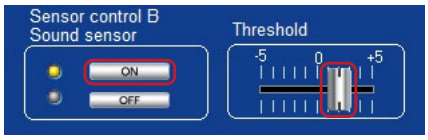


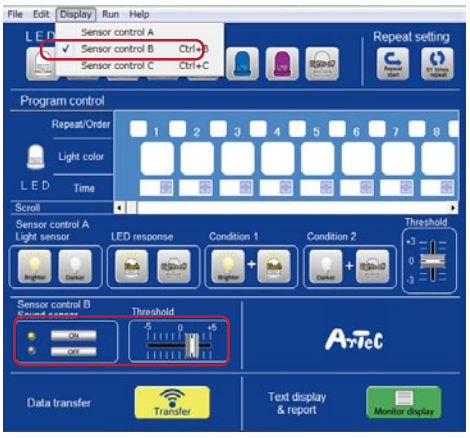
Checkpoint!

I ran the Light Sensor Program! ☐

■ How to Use Sound Sensors

You'll need to select **Display** from the Menu bar and click **Sensor Control B** in order to use your Sound Sensor.
Click the ON button for the Sound Sensor and your program will now use it. Set the threshold of the icons by dragging the Threshold slider. The higher the value, the louder the sound will need to be for your program to respond. For example, a program that responds to small sounds will need a threshold value of -5. The picture to the right shows a program that will start in response to any sound higher than +2.





■ A Sound Sensor Program

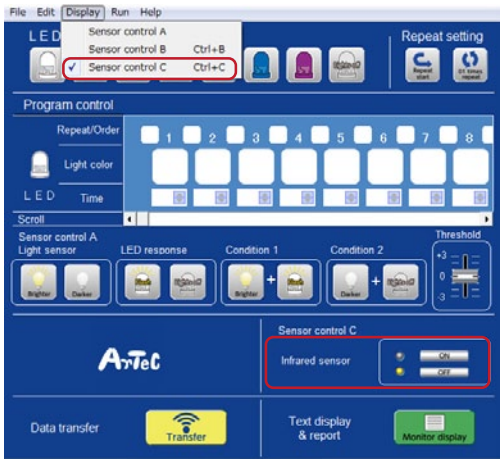
Make a program that lights up an LED when you speak into the Sound Sensor (mic).
Try adjusting the sensor threshold and see how it changes!

Checkpoint!

I ran the Sound Sensor program! ☐

■ How to Use Reflective Infrared Sensors

You'll need to select **Display** from the Menu bar and click **Sensor Control C** in order to use your Reflective Infrared Sensor. Click the ON button for the Infrared Sensor and your program will now use it. As your Reflective Infrared Sensor only detects changes in heat, there is no threshold that needs to be adjusted. The picture below shows a program which starts once your Reflective Infrared Sensor has detected a change in heat.



■ A Reflective Infrared Sensor Program

Make a program which starts when you cover the Reflective Infrared Sensor with your hand.

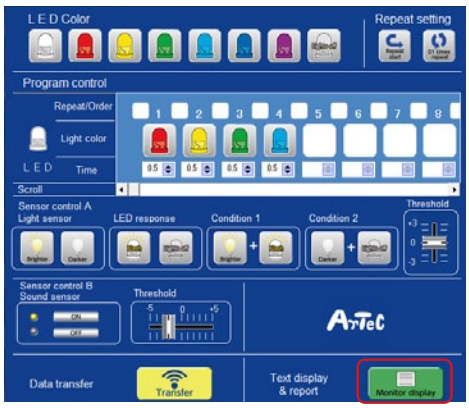
Checkpoint!

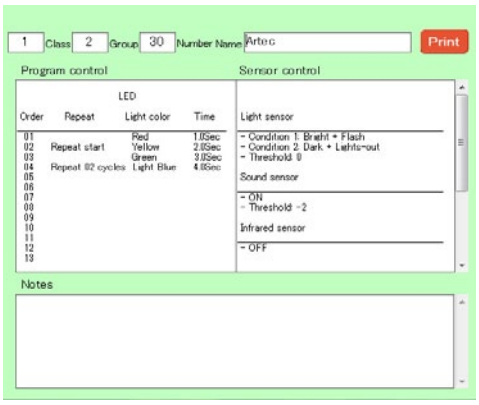
I ran the Reflective Infrared Sensor program! ☐

7. Get Creative!

■ Apply Your Knowledge and Make Your Own Program!

Monitor Display: Click this button to display the text for any program you've made.
You can also enter your name, grade, class and your impressions and print them out!





Checkpoint!

I made and ran my own program! ☐

8. Customize It!

■ Make your light your own using Artec Blocks®!

Checkpoint!

I've customized my light! ☐

9. Summarize It!

(1) What roles do the software, sensors, and computer have in your programming? What else did you learn?

(2) What was easy about making a program? What was hard? How did you solve the problems you encountered?

(3) Aside from LEDs, what else would you like to use the Light, Sound, and Reflective Infrared Sensors of your PC Programming Light to control?

(4) How can programming be used to improve our lives?

(5) How do you think programming will be used in the future?