Robobloq

Q-scout Series Course

Section 1:
《The first time to meet Q-scout》

Curriculum objectives

Knowledge and skills (Technical)

1.Understand the use of tools such as basic parts of a bot and screwdrivers.

2. Build a scout model.

3. Know the main control board, understand the primary programming interface, and to learn to use module to control the rotation of electrical machinery. And writing a simple program.

Knowledge and skills (Cognitive)

1. Uses of various tools to assemble the Q-scout helps to develop students' hands-on ability.
2. Various programming activities helps students to improve their programming logic and cognitive level.

Knowledge and skills (Emotional attitude and values)

1. In the process of assembly, model making and programming, students are able to experience the charm of science and develop their interest towards it.

Curriculum introduction

Q-scouts are the protagonists who leads us in the exploration of the robotic world, so, it is called scout. In addition to the specialities of reconnoitre， it can illuminate dazzling and colourful light, sing wonderful songs, and Q-scout with installed special devices is more flexible and capable of doing multi-tasks.

Next , let's get to know the Q-scout and discover more of its magical functions.

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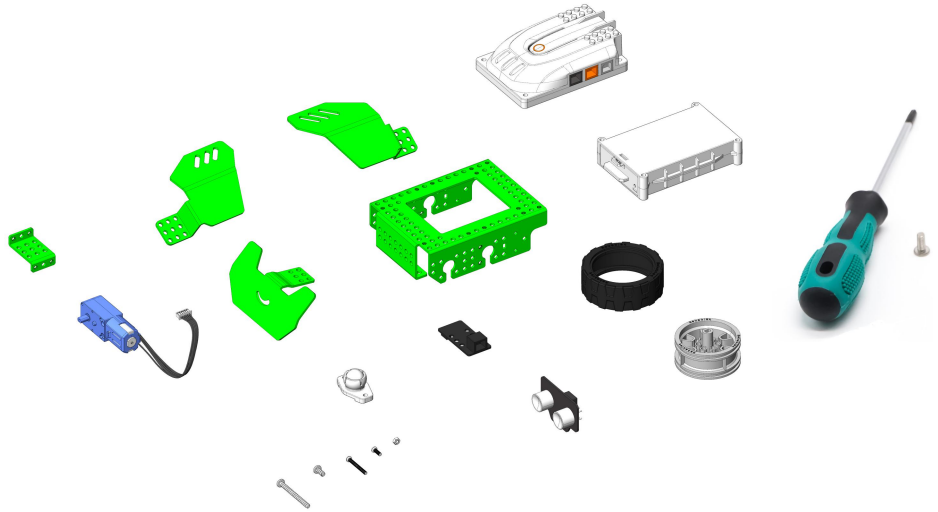
Curriculum introduction

The Q-scout is a car robot that is built and assembled from metal parts.

But now the Q-scout is not a complete structure. It is still a pile of components stacking on the table. For the beginning of exploration, let's help Q-scout to assemble a solid body.



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Task analysis

How do we assemble the Q-scout with so many parts?

We have an additional task apart from the task of assembling a complete Q-scout bot.

The mission is to get our Q-scouts on the move and move on a distance.

1. Let's start thinking the complete process.
2. How to assemble solid Q-scout?
3. How to write a program to let Q-scout move?

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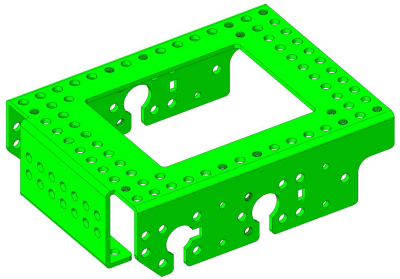
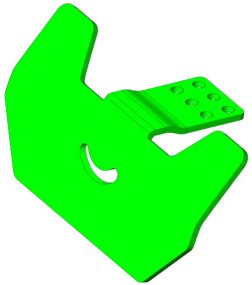
Knowledge explanation

1. Before you start assembling the bot, let's assemble the main metal parts and essential tools - screwdriver and spanner.

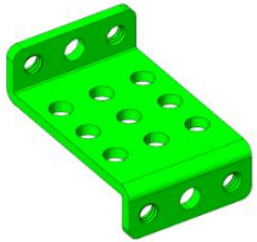
2. To make our Q-scout to move, we need to give command. In fact, we need to learn to write program which will control the movement of Q-scout.



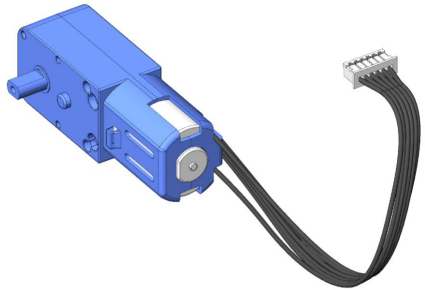
Chassis



Smile baffle



S-type bracket



Electrical Machinery

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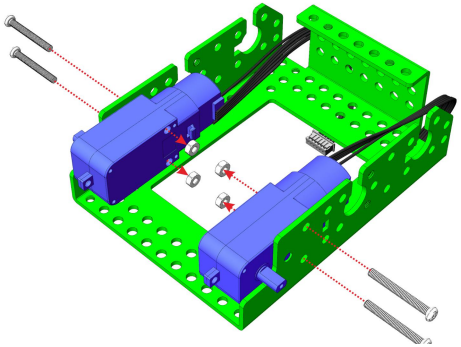
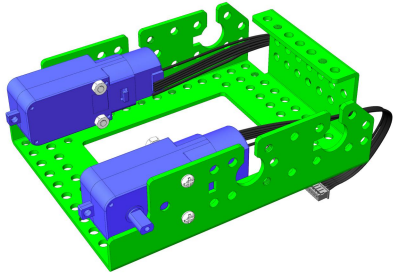
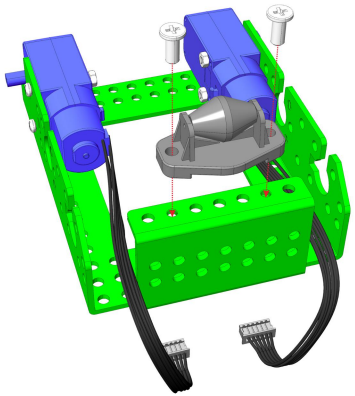
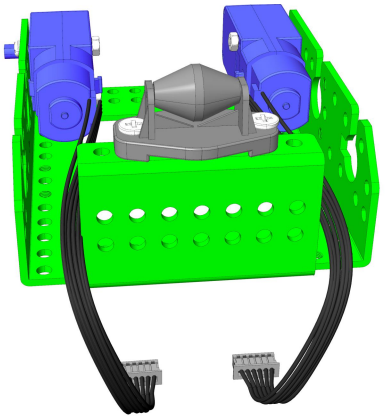
Hands-on practice

1. Fix the motor on the robot chassis and intall the guide wheel at the rear.









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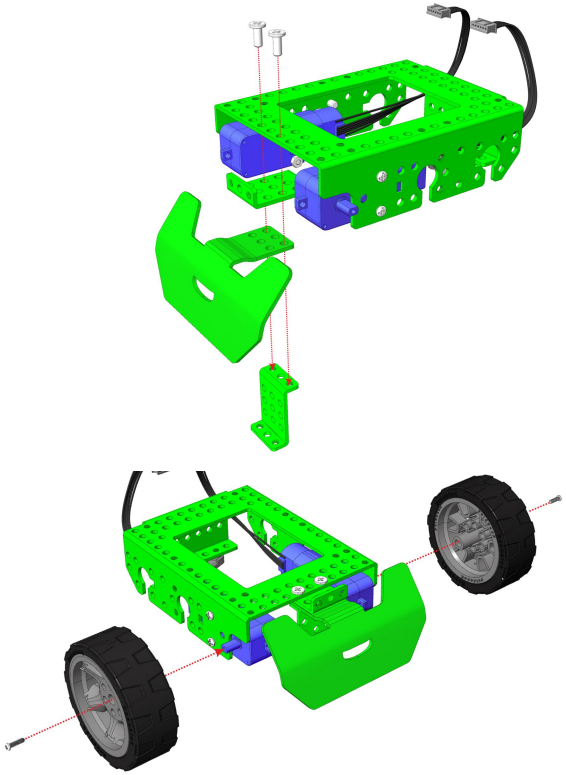
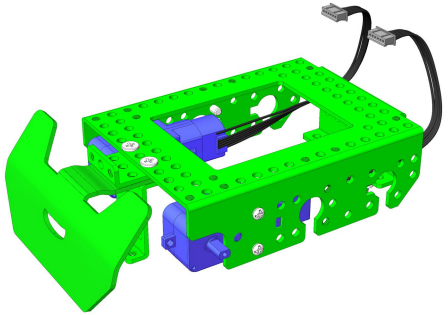
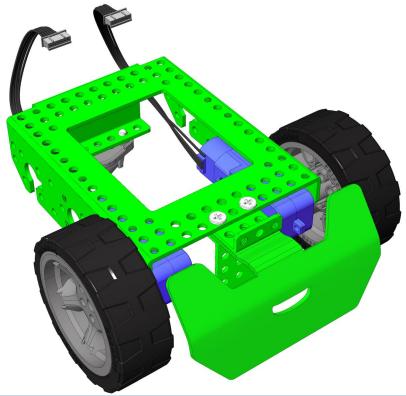
Hands-on practice

2. Intall the smiling beffle part of the Q-scout?







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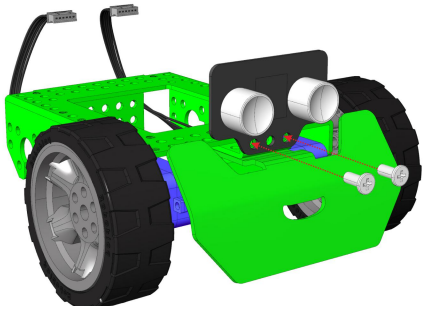
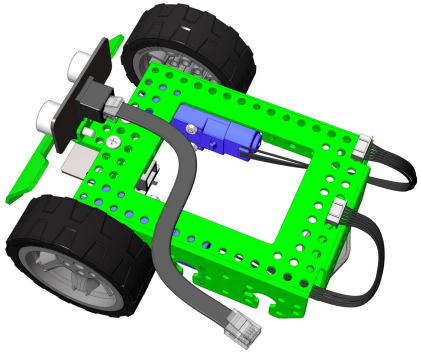
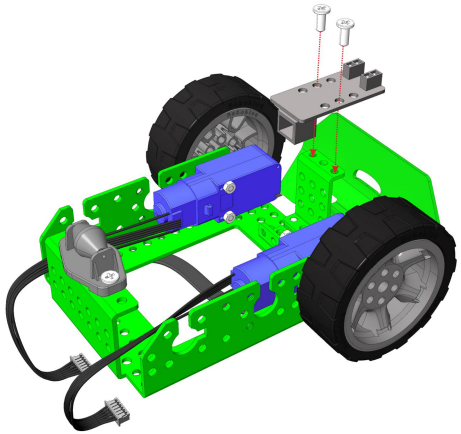
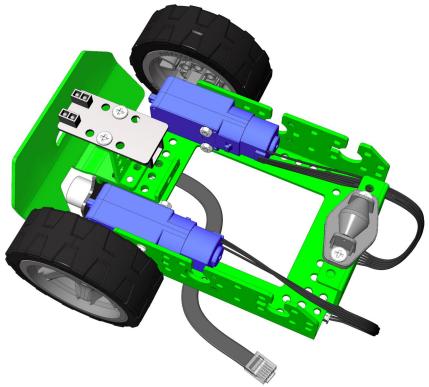
Hands-on practice

3.Install ultrasonic sensor and line follow sensor.









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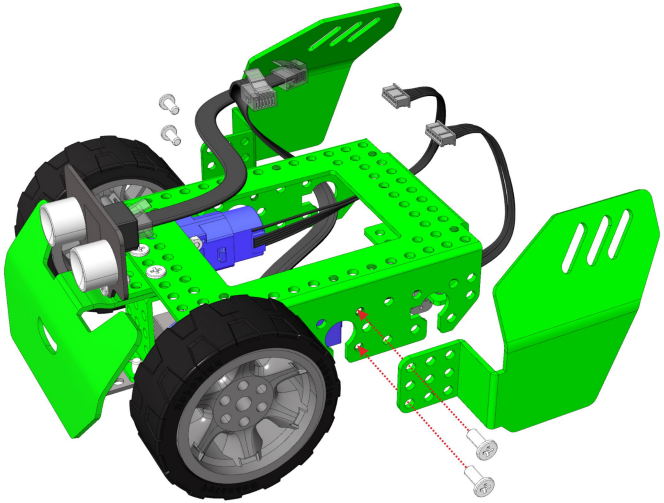
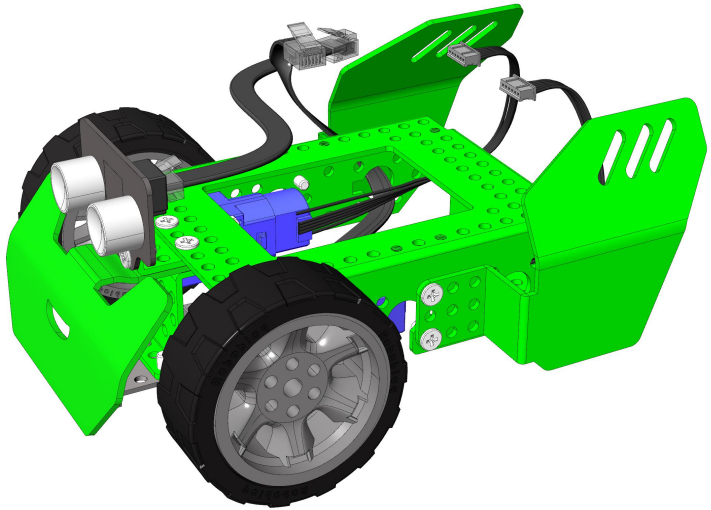
Hands-on practice

4.Install the left and right baffles on both sides of the chassis.





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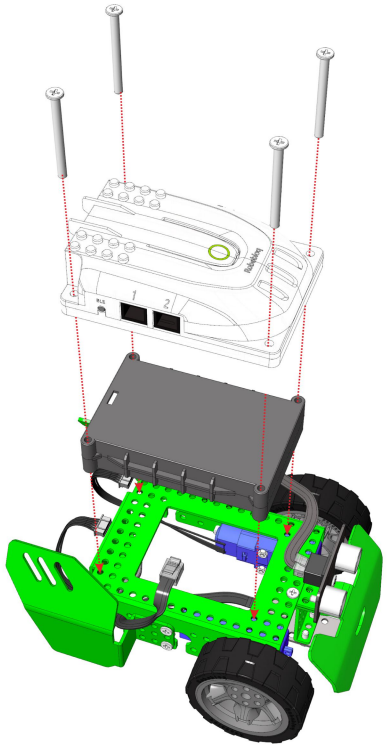
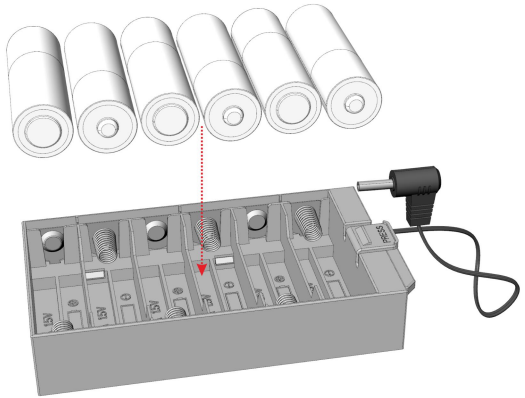
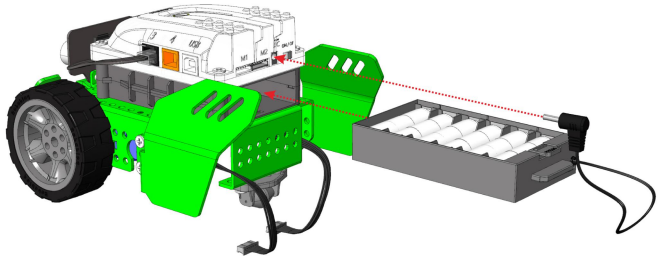
Hands-on practice

5. Install the battery and place the battery pack in the slot.







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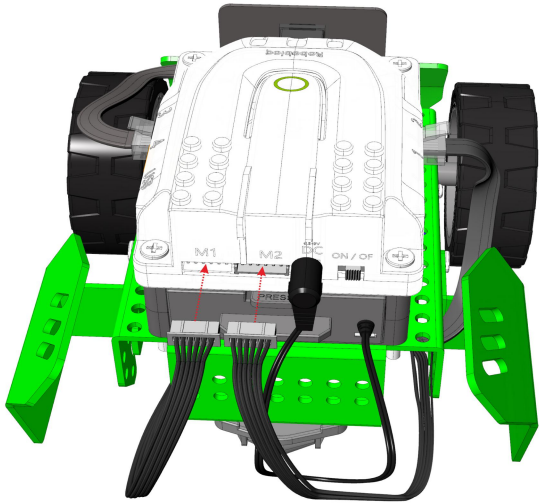
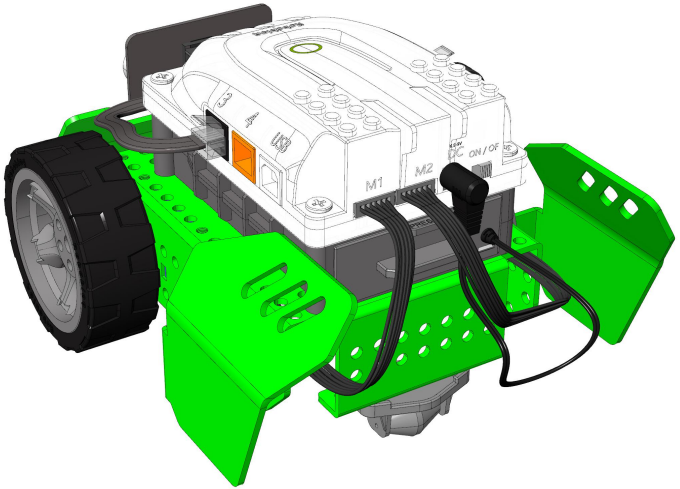
Hands-on practice

6. Connect the motor connection line to the main controller M1 and M2. Please remember to connect the left motor connection line to the M1 port and the right one to the M2 port.





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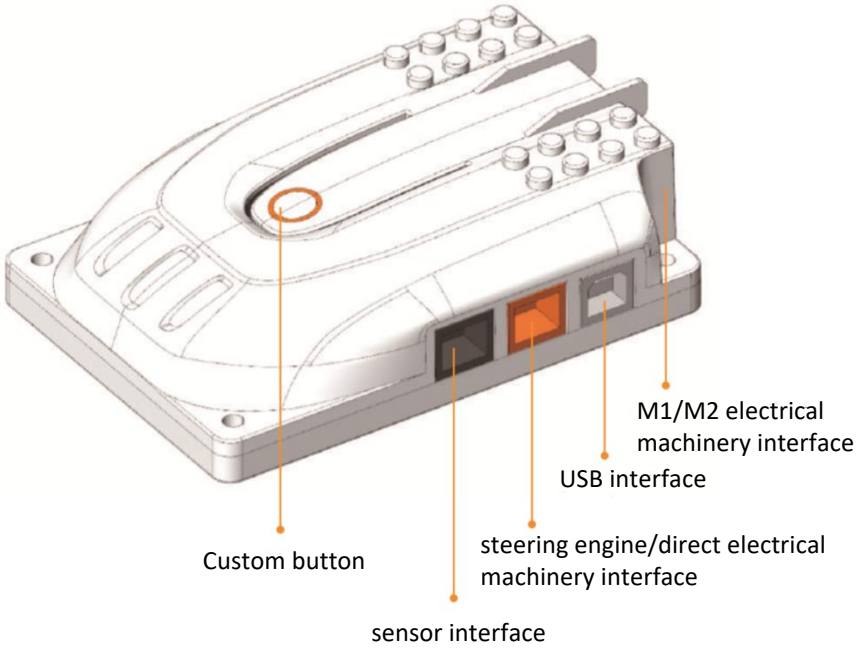
Hands-on practice

After completing the work of structure assembly of the Q-Scout, we need to write a program to control the robot movement- that moves forward.



Cognitive control board

The main contral board is the brain of the Q - Scout. After connecting the Q scout's motherboard to your mobile phone app through Bluetooth, the main board sends the instructions to all sensors and processes all the instructions sent back to the main board.

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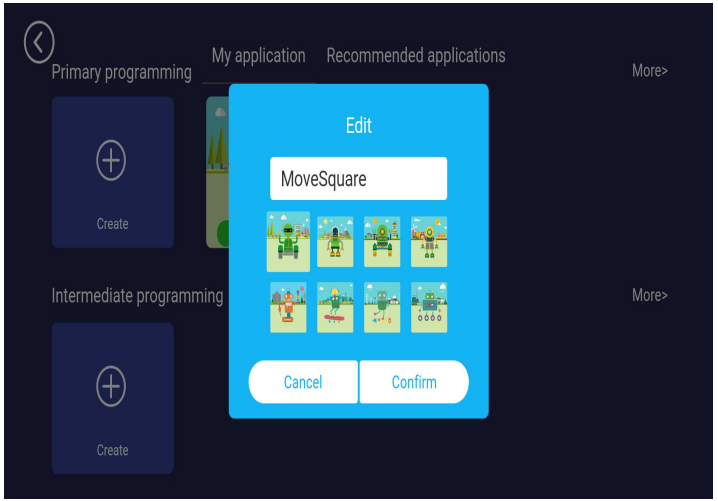
Hands-on practice

Open the programming applicaion on the mobile phone and create the primary program application

①.click the icon “my application” on the screen with your finger；②click create application and create a new application.

①



②

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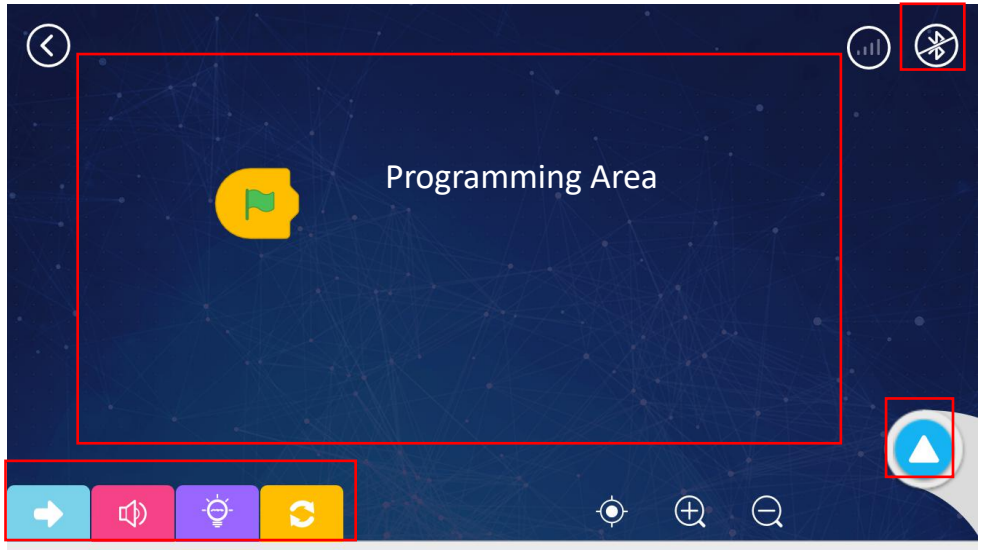
Hands-on practice

Cognitive programming interface

bluetooth connection



Icon module area

movement sound light control

Running program

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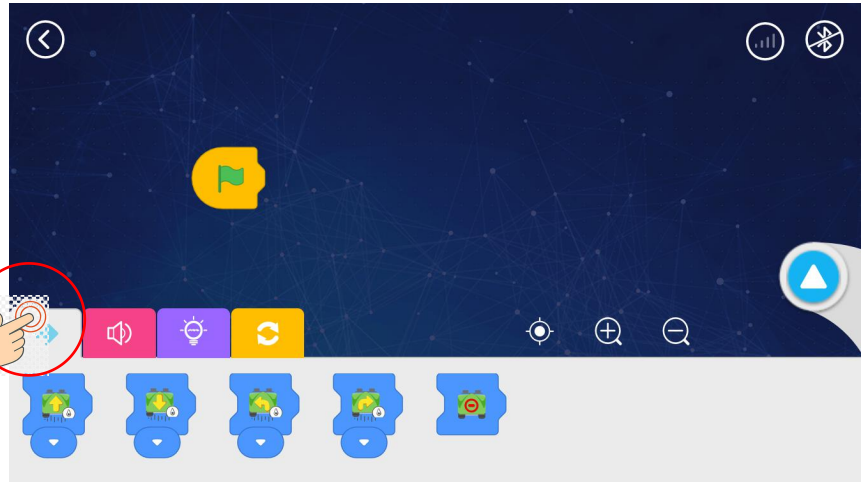
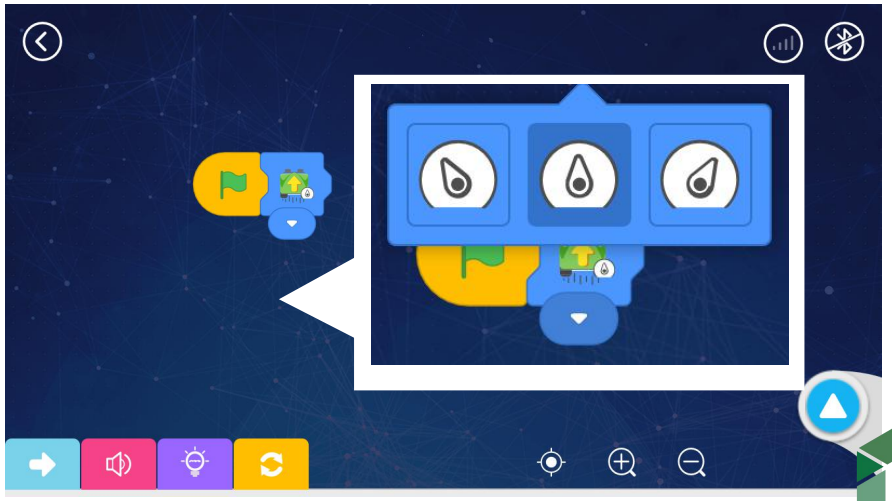
Hands-on practice

Click on the motion icon to display various icons for the operations such as straight, back, left, right, and stop motion icons. Select the straight line icon which will be automatically connected to the start icon. Now, click on the triangle on the bottom of straight icon, here, you can set the rotation speed of the motor low, medium, and high.





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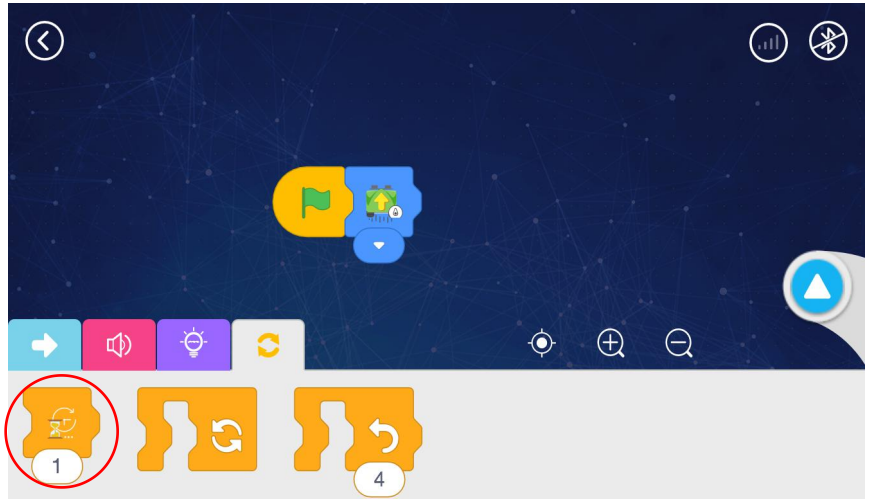
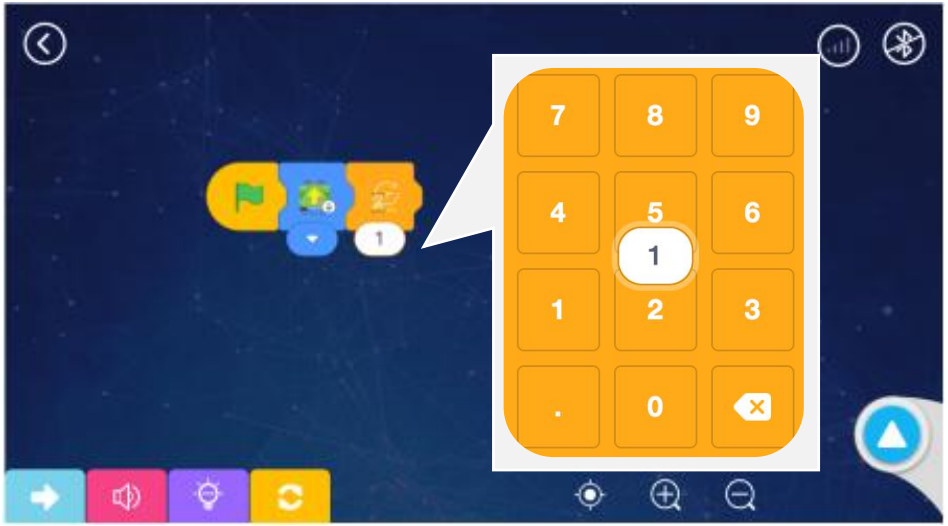
Hands-on practice

Select the wait time icon in the control module and after a successful connection, click on the wait time icon and enter 1 in the program, then you can set the length of time in seconds.





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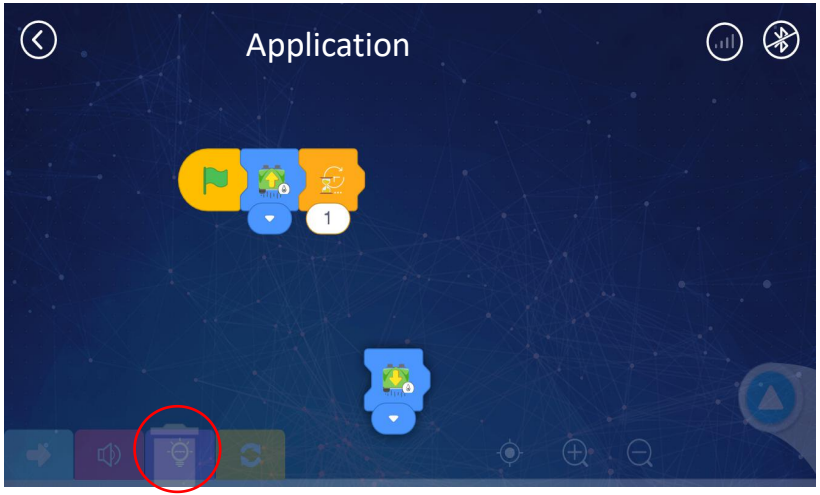
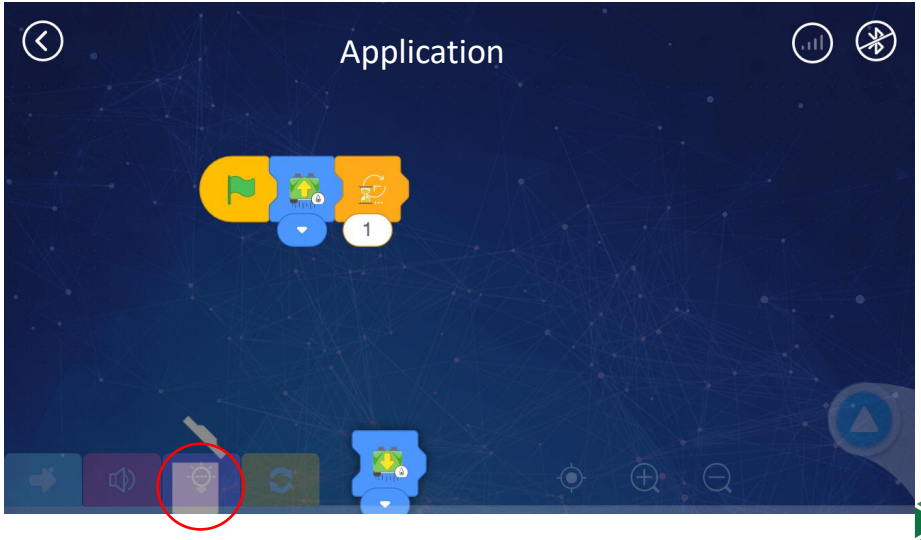
Hands-on practice

Delete icons: While programming the bot if you need to delete extra icons, drag the icon, drop-down to the bottom, the trash flag can appears and by dropping the icon on the thrash icon you can delete the any undesirable icon.





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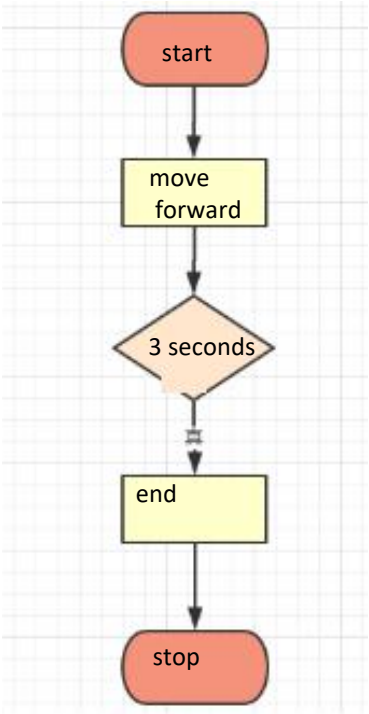
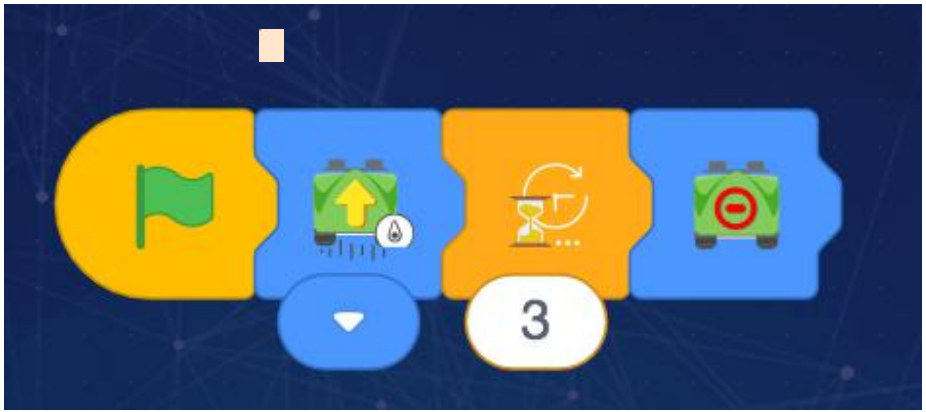
Hands-on practice

Folwchart thinking



Write a program to let the Q-Scout stop after 3 seconds, turn On the main control panel power switch, click on the Bluetooth icon in the upper right corner of the mobile phone. Once the phone has connected to main control panel, click the start icon which is at the lower right corner of the mobile phone and then observe the movement of Q-scout.

Real



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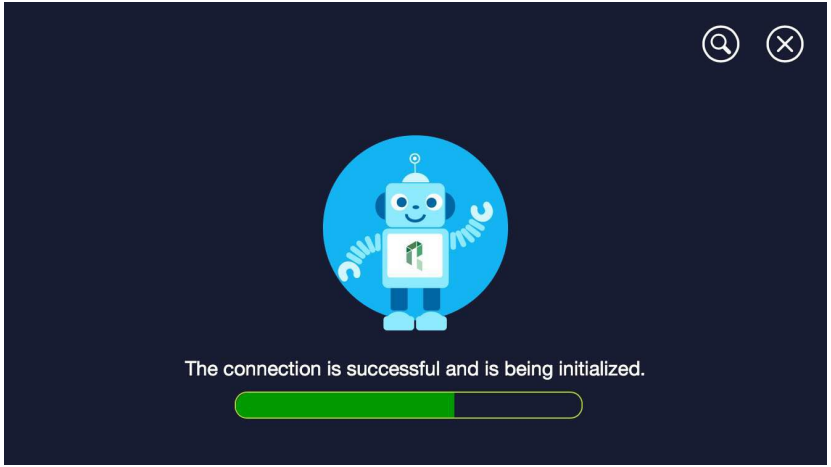
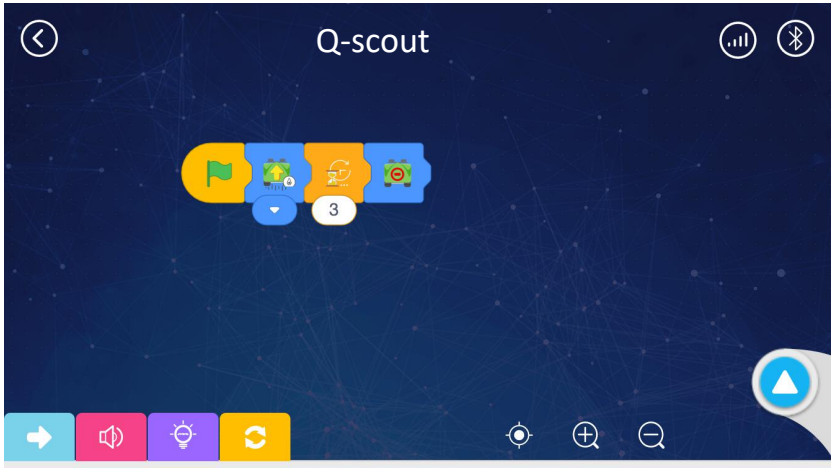
Hands-on practice

When the mobile phone is connected to the scout via Bluetooth and the program has been written. Click the icon of Bluetooth, appearing in the upper right corner of the machine, then click on the icon of "run program", appearing in the lower right corner of the main screen. With these steps the Q-scout will start moving and this written program will make the scouts move straight ahead.





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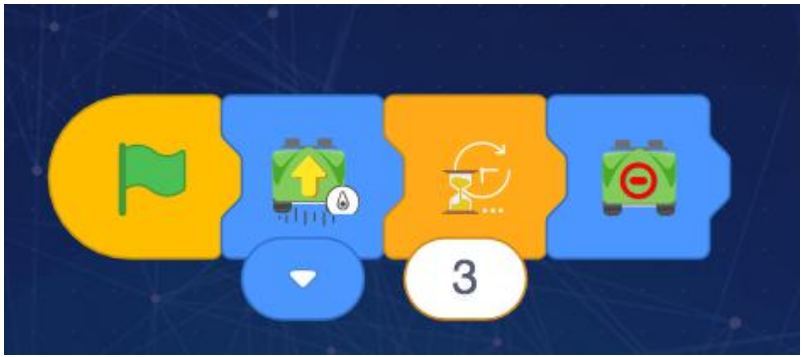
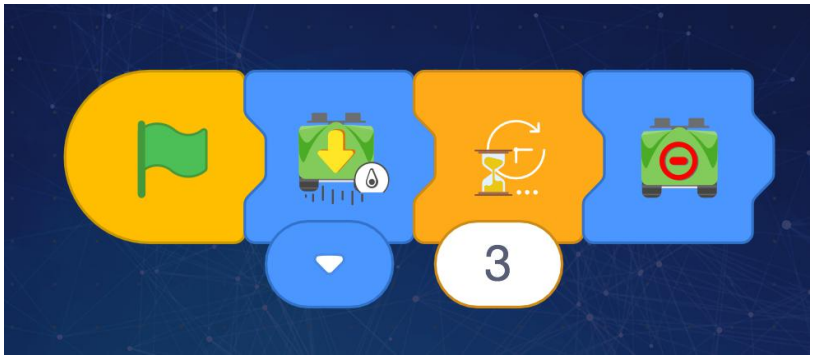
Extends

1. Try to write a Q-scout program to move in reverse direction and observe the rotation - whether the wheels are moving in the forward or backward direction and explain what's going on?





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Conclusion and reflection

1. What problems did you encounter when assembling the Q-Scout structure? Explain about your solutions to problems.
2. What are difficulties you faced in assembling the metal parts? What are the things you needed make the structure of building?
3. What new ideas do you have on the basis of the comparison between the procedural approach and the flow-sheet approach?

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Company: Robobloq Co., Ltd
Address: Room 208, Building B53, Zhongchuang Industrial park, Liuxian Avenue, Taoyuan Street, Nanshan District of Shenzhen
E-mail:hello@robobloq.com
Telephone: + 86-0755 -26926929
Website: http://www.robobloq.com

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