



Q-scout Series Course

Section 4:
《Pass Through Maze》

Curriculum objectives

Knowledge and skills (Technical)

1. Getting familiar with how to control Q-scout's movement and movement distance using motors and wait blocks.
2. Learn to use the remote control model to control the movement of Q-scout.

Knowledge and skills (Cognitive)

1. Through the hands-on opportunity, students are able to compare and analyse the features of Q-scout movement programming and model.
2. Exercise students' ability of thinking and solving problems in the task of helping Q scouts to move out of the maze.

Knowledge and skills (Emotional attitude and values)

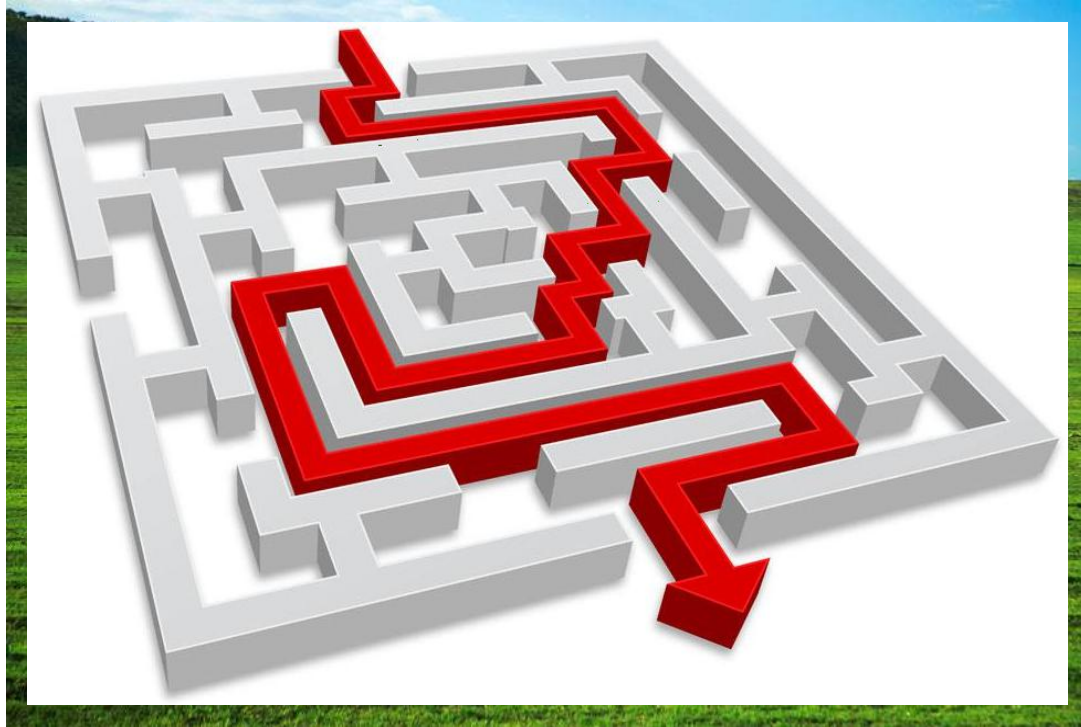
1. Cultivate students' spirit of helpfulness, solidarity and cooperation through “ Out of the Maze” task.

Curriculum introduction



Call Q-scout, call Q-scout, there is an urgent task now, the neighbor's pet dog is lost in the park, they need Q-scout to find it, Q-scout immediately set out from the park after receiving the task.

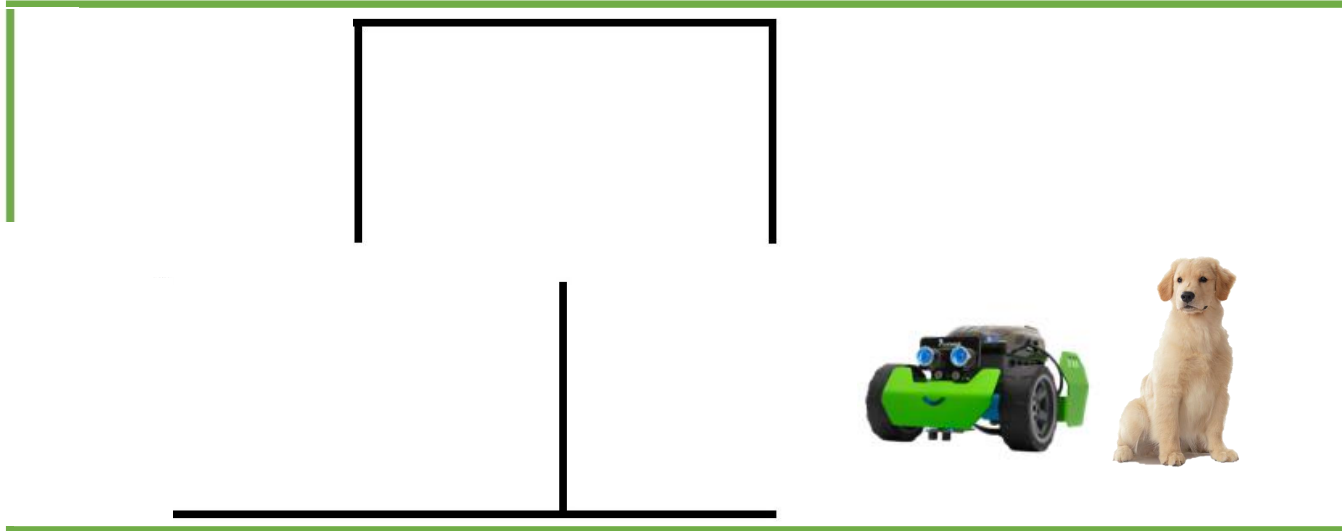
Curriculum introduction



It didn't take a long time for the scout to find the lost dog in the corner of the park. When Q-scout are ready to return with the dog, they found themselves lost in a maze in the park.

Curriculum introduction

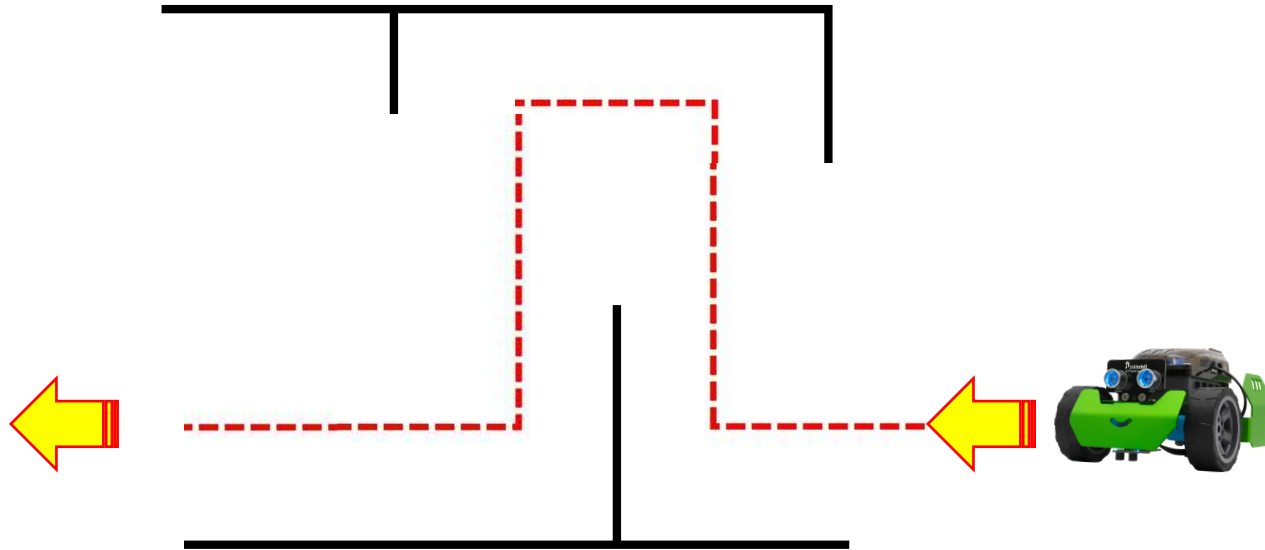
The scouts had lost their way in the maze and could not find the exit route. Let us help Q-scout to walk out of the maze.



Task analysis

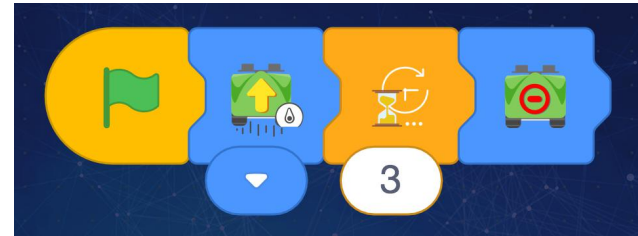
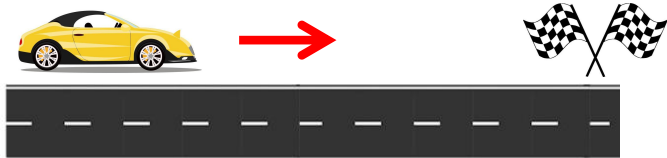
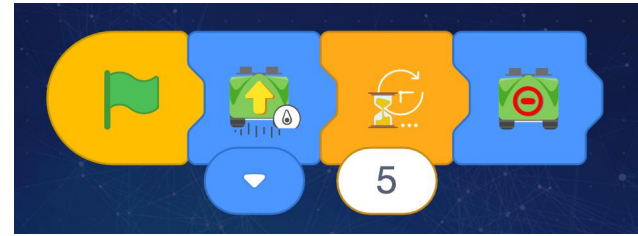
How do you help Q-scout to come out of a difficult path without hitting it?

1. How to make Q-scout turn before hitting in the process of straight walk?
2. How to control the turning angle that is suitable for Q-scout?



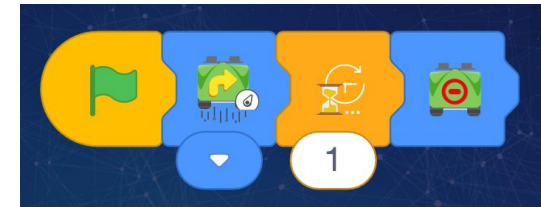
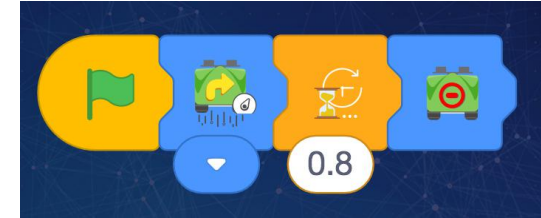
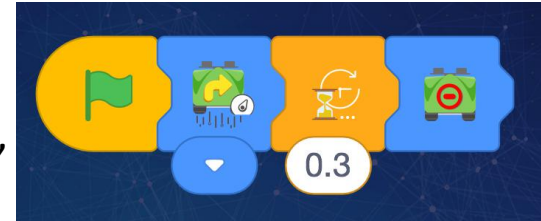
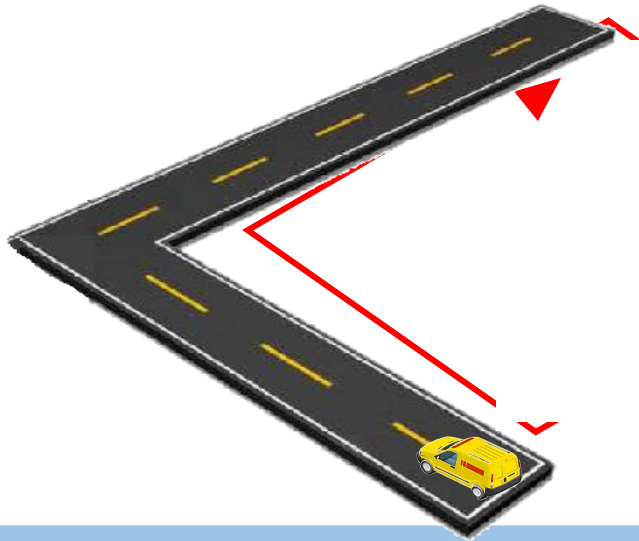
Knowledge explanation

After observing the paths with different distances in the figure, the cars start from the starting point to the end point at the same speed, let's write the test program and analyzing the changes in the running time of the cars.



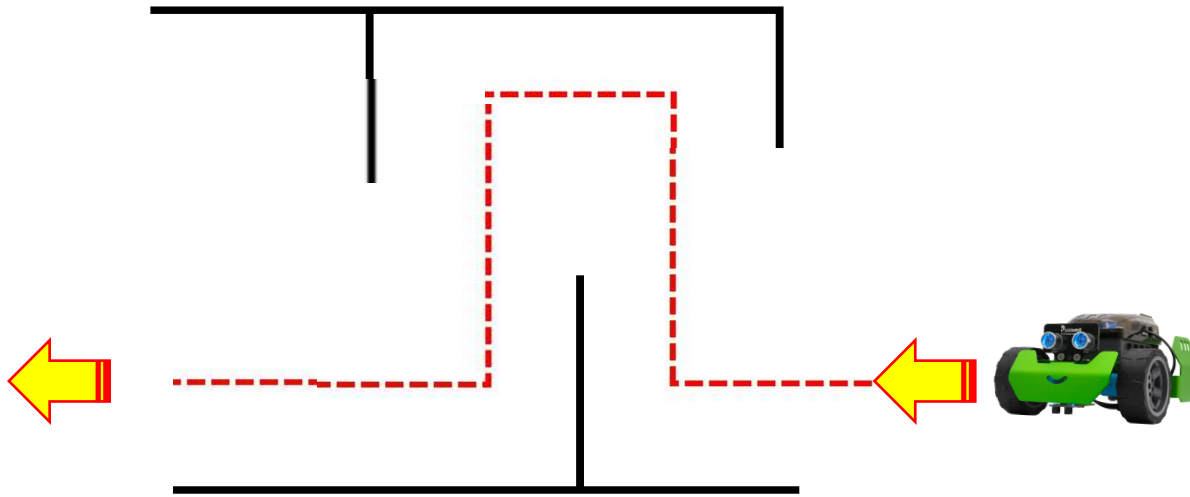
Knowledge explanation

When turning right at a right-angle, how to make the turning angle of Q-scout (at least roughly) maintain a right angle radian? According to the test of the reference program, record the curve charge of Q-scout turning, and debug the turning time of Q-scout for a right angle radian.

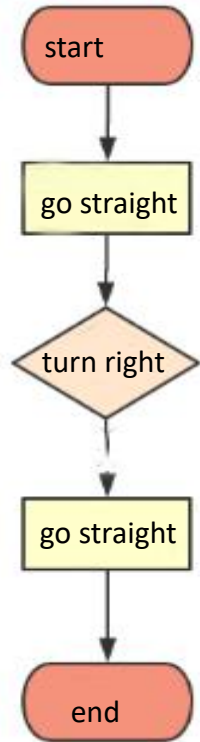


Knowledge explanation

In order to let the scout to successfully walk out of the maze, we know that it needs to go like that orderly, go straight—turn right—go straight—turn left—go straight—turn left—go straight—turn right—go straight.

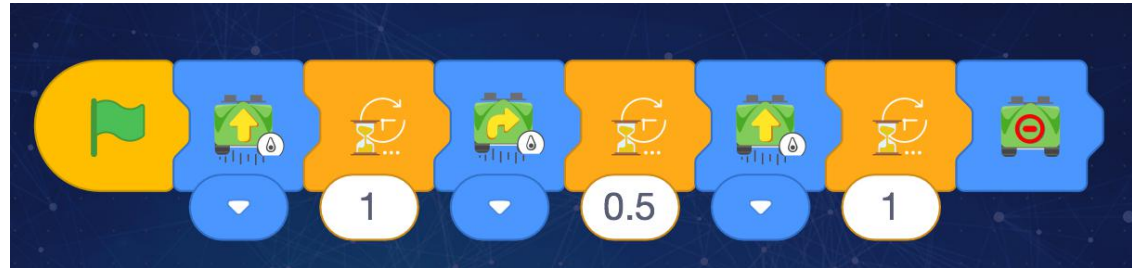


Hands-on practice



1. As per the flow chart (given on the left side) write a Q-scout program of going straight, turning right and going straight.

2. Write the complete program for walk out of maze.



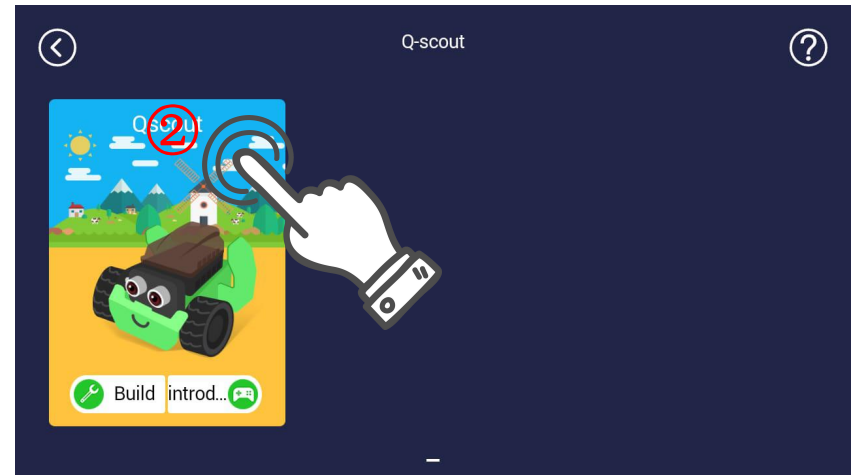
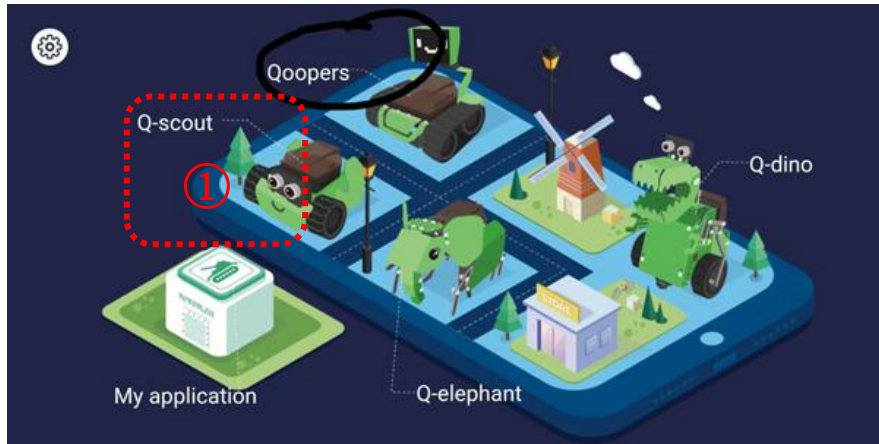
Note: The time duration mentioned above in the program is as per the size of the field.



Hands-on practice

Apart from helping the Q-scout walk out of the maze through rudimentary programming. There is also a remote model that directly control the Q-scout movement.

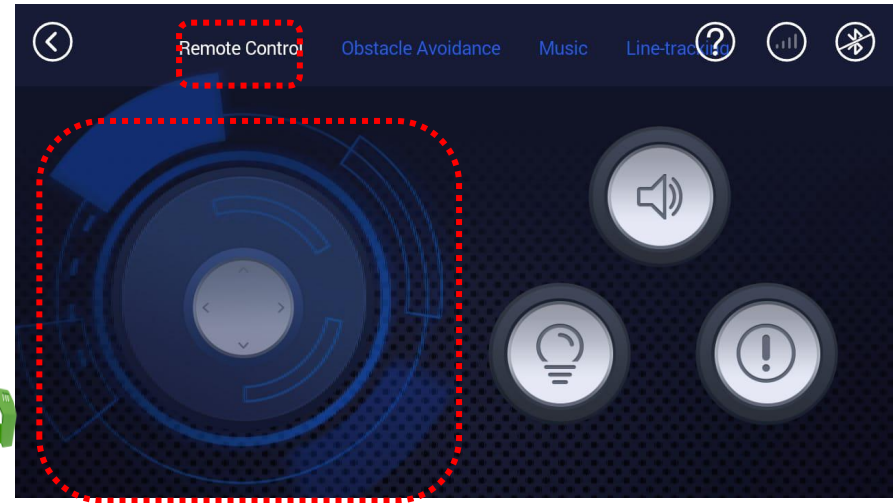
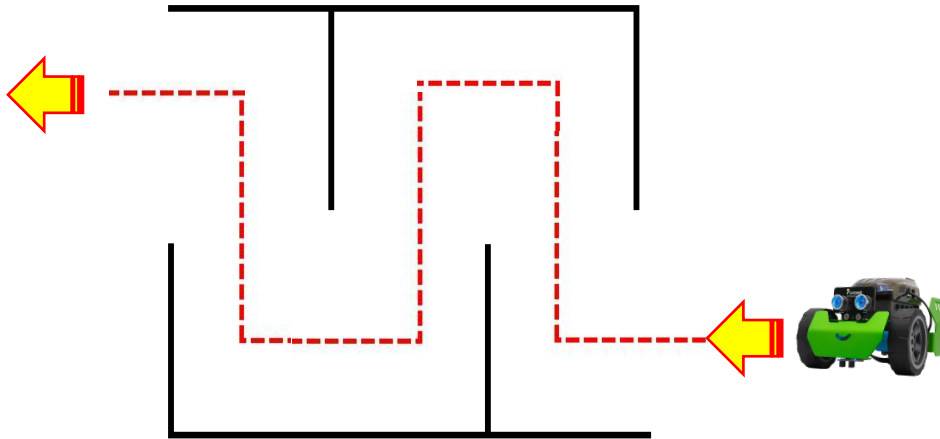
In the interface of mobile phone application, ① choose the square matrix icon of Q-scout ② click on the body of Q scout.



Hands-on practice

You can choose the remote control model of Q-scout.

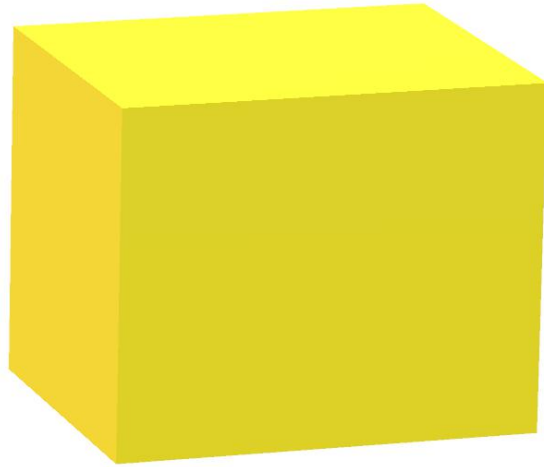
But the task of maze has become more complicated, we control Q-scout to help it to walk out the maze quickly.



Direction rocker control button

Extends

1. Build a different site by using nearby materials, and control Q-scout to cross through safely in the remote control model.
2. According to the cuboid model site, write the program that let Q-scout to circle the cuboid.



Conclusion and reflection

1. In practical operation, if the motor interfaces M1 and M2 are connected in the opposite direction, what will happen to the operation result of Q-scout? And think about the reason?



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