

07 - Missile Defense Fort Barrette

Basic Teaching Information

Teaching facility	AI Module 1s	Teaching mode	Project-based learning	Class duration	90 minutes
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Teaching Objectives:

1. Learn to use wait and conditional loop modules;
2. Review the working principle of gear acceleration;
3. Review how to use infrared sensor.



Focus

Air defense missile is a missile launched from the ground, ship or submarine to intercept air targets. Infrared sensor is the key to reliably monitor, detect, identify, aim and intercept the target of missile defense system. We will design a missile defense fort barbette, use infrared sensor to identify missiles so as to conduct missile defense and interception.

Exploration

We need to solve two problems in this lesson.

1. How do we fire the projectile?

We can use the closed-loop motor to provide power, the projectile is shot by the high-speed rotation of the collision needle.

2. How should we design the trigger device?

We can use the infrared sensor as the switch to control the opening and closing of the launching system.

Creation

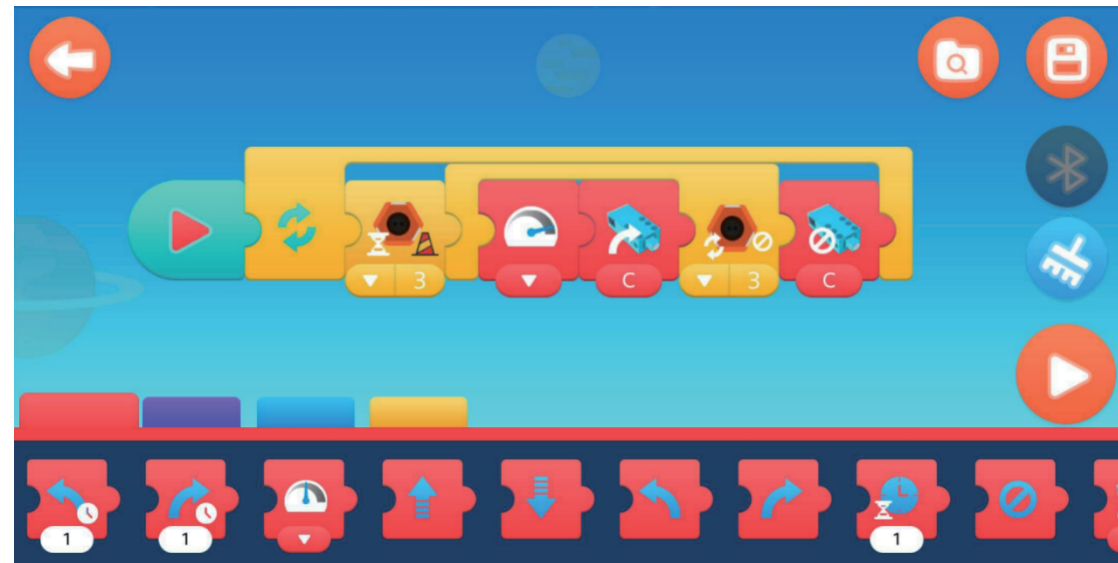
The core of this lesson is to build a projectile launcher

1. Fix the closed-loop motor vertically on the general chassis;
2. Use gear acceleration to drive the high speed rotation of 70 beams as a collision needle;
3. Use 110 beam and decorative parts to build barrel;
4. Install infrared sensor for target detection;
5. Use 126 degree 4x6 beam combined with 50 beam to build base.

Programming

This lesson is about advanced process control, students need to learn how to break the loop. Use APP programming, when the infrared sensor detects the target and enters the loop, the motor will continuously shoot the projectile. When the infrared sensor loses its target, turn off the motor and repeat the above actions.

Explore how infrared detects target and loses target.



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Evaluation

1. How do we fire projectiles?

We used closed-loop motor to provide power and the launch projectiles by high-speed rotation of the collision needle.

2. How do we design the trigger devices? Which sensor is used? And what is the working principle?

The infrared sensor is used as the trigger device to detect targets.

Show

Key Point 1: Explain the application of gear drive acceleration structure.

Key Point 2: Explain the programming logic, infrared waiting module and infrared break loop module. Explain the actuator control mode.

