



Level 2

Exploring Engineering & Robotics

In today's world, almost everything we see is either a robot or was made by one! In Exploring Engineering and Robotics, students will use engineering principles to design their own multi-function robots. Students will learn how to use circuitry to light up LEDs, build a truck robot that can navigate a maze, and code a line-following robot.

In this project-based course, students will get to experience first-hand how engineers solve real-world problems. By the end of the course, each student will have experience with mechanical, electrical, and software engineering principles. This course will enable them to think critically to decompose problems and solve everyday challenges!

objectives

- ✓ Design and build robots to solve complex problems
- ✓ Learn how to approach problems using the engineering process
- ✓ Use visual and text-based coding to design program for robots

key projects

- ✓ Designing a circuit to turn on LEDs
- ✓ Building a maze-navigating robot
- ✓ Building a remote-controlled robot
- ✓ Writing a program that uses sensors
- ✓ Navigating a labyrinth using a robot and sensors
- ✓ Designing a multi-function robot

units

Unit 1 | Introduction to Robotics

Programming a circuit to turn on an LED

Unit 2 | The Engineering Design Process

Designing a robot to navigate an obstacle course in a time trial

Unit 3 | Loops and Conditionals

Building a robot that can be controlled via remote control

Unit 4 | Balancing Performance Optimization and Reliability

Incorporating infrared sensors to build a mobile robot capable of following a line

Unit 5 | Integrating External Hardware

Building a system that determines how close an object is to an ultrasonic sensor

Unit 6 | Maze Navigation

Designing a robot that can navigate a maze and make decisions

Unit 7 | Integrating Text-Based Programming into Robotics

Programming a robot using text-based coding - including variables, loops, and conditionals

Unit 8 | Final Project

Designing and building a robot that integrates several sensors to complete a complex task