



Discovery ROBOTICS

AGE-8



The Ultimate STEM Robotics Program for Inquisitive Minds

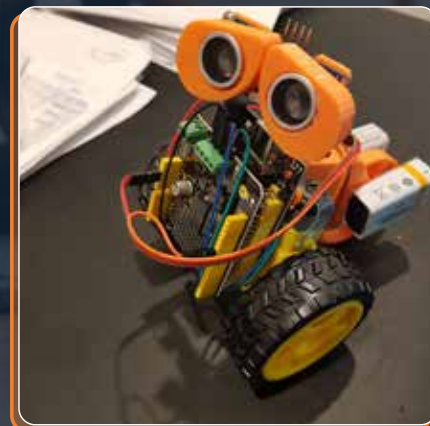
The Discovery Robotics curriculum focuses on teaching our youngest students **Programming, Computer Design–3D Printing and Electronic Circuits** in a hands-on, step-by-step approach.

All Robotics courses follow a structured curriculum with daily challenges designed to promote critical thinking and experiential learning. The curriculum starts with teaching programming using IPADs then graduates onto using computers. New robots are introduced in every course to keep students engaged and excited to learn important STEM skills. The end goal of the program is to build confidence in our young students and have fun learning!

PROGRAM DETAILS

10-month curriculum
Classes once per week
classes One-hour in duration
6 students max per class

The Discovery Robotics curriculum was created by a team of mechatronics engineers with 25+ years of global industry experience with the aim of advancing STEM education amongst Canada's youth. The Discovery Robotics program's vision is to introduce programming, mechanical design, and electronics to young students through real-world applications and a step-by-step approach.



Alumni Robotics (ages 11+) Projects

DISCOVERY 4: ROBO-GAMES

Prerequisite: Discovery 3

Students continue to build their programming skills, this time transitioning away from IPADs and starting to use computers.

An advanced Lego robotics platform allows students to start learning robotics at a higher level. Various Olympic-style challenges are designed to teach students how to use more complex sensors which assist detecting different conditions when competing in our Robo-Games.



DISCOVERY 5: SUMOBOT CHALLENGE

Prerequisite: Discovery 4

A fun application course designed for students to practice and apply their knowledge from previous courses.

Sumo robots containing various motors and sensors are programmed to push the opposing robots out of the sumo ring. Colour sensors will keep an eye on the ring's boundaries while ultrasonic sensors keep an eye on the opposing robot. All students will have a blast throughout this course but only one Sumobot will be left standing,



DISCOVERY 6: ROBO-RESTAURANT

Prerequisite: Discovery 5

I'll have a kale salad with Parmesan and a ginger ale please...

The final course in the Advanced Programming Skills series involves a futuristic application a- robots waiting tables in the Robo-Restaurant. Students will work independently to program their bots to bring various dishes from the kitchen to their customers, utilizing various sensors to make decisions based on their customer's order.

A fun challenge designed to promote critical thinking through programming the restaurant of the future.



DISCOVERY 7: COMPUTER DESIGN & 3D PRINTING

Prerequisite: Discovery 6

The first course in the Mechanics series relates to the design of 3D printed mechanical parts. Students learn various design tools using Autodesk Fusion 360 to create their own designs. Starting with sketching, students complete various design projects to practice using design tools and features. Through select projects, students will practice using fundamental tools in mechanical design.

Design projects are assigned for students to independently apply their design skills and create functional mechanical components that could be 3D printed.

**DISCOVERY 8: SIMPLE CIRCUITS**

Prerequisite: Discovery 7

Building robots cannot be complete without learning how parts we design should fit together. This machine design course teaches students about the fundamentals of machine design including fits and clearances, structure design, levers, gears, and more.

Students will design each component of the machine and will assemble them together in the design software. By learning about joints and constraints, students will create a virtual simulation of their creations. In industry, design simulation is an essential tool used by engineers to predict functionality and performance before building a single prototype.

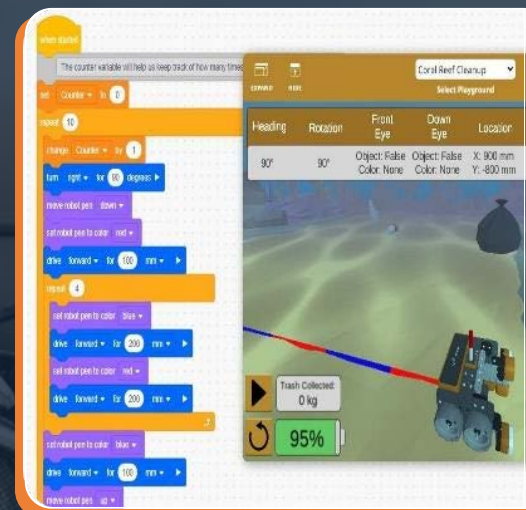


DISCOVERY 9: CODING BLITZ

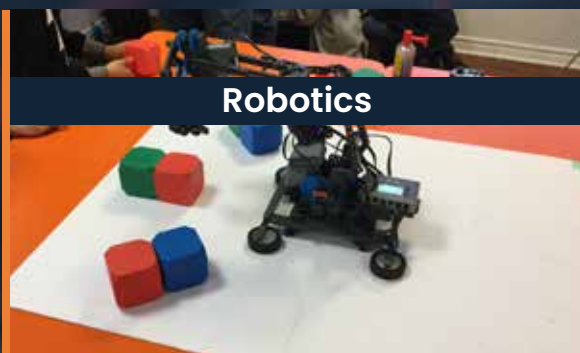
Prerequisite: Discovery 8

The final course of Discovery Robotics revisits programming in preparation for the next Robotics program (ages 9-11).

Students will use a text-based drag and drop coding interface to program Virtual robots to complete various fun-filled challenges. Students will practice using different types of loops and conditional statements to complete daily challenges using a variety of robot sensors.



What's Next?



Robotics

Robotics for ages 9-11 is available for students graduating the Discovery program and looking to continue advancing their skills in programming, mechanical design-3D printing and electronics. All three of these elements will be taught at an increasingly advanced level throughout this program, leading to the introduction of programmable microcontrollers used to create custom robots