



STEAM Engine afterschool program is proudly funded by:

**HAMILTON  
COMMUNITY  
FOUNDATION**



# STEAM ENGINE

www.mathstronauts.ca



Varies by School

TIME



Hosted at School

LOCATION



Varies by School

COST



Varies by School

Term 1: Oct - Dec

OR

Term 2: Feb - Apr

DATES

## Description

STEAM Engine is a weekly program focused on STEAM: Science, Technology, Engineering, Arts and Math. At STEAM Engine, we kick start youth's interest and passion for STEAM through hands on projects, putting them on a fast track to developing STEAM related skills in a fun and engaging environment. Our curriculum is skill focused: through multidisciplinary projects, our students learn technical skills such as how to code, perform computer aided design (CAD), 3D print, work with electronics, design control systems, and build overall knowledge in STEM subjects.

Participants at STEAM Engine will be completing the Assistive Device Project, discussed in detail on the next page.



**Innovative**



**Skills Focused**



**Experiential**



**Progressive**

More Information: Email [contact@mathstronauts.ca](mailto:contact@mathstronauts.ca) or call us at **(289) 887-2157**

**2019 - 2020**

# Assisstive Device Project

Students learn how to design and build basic circuits to construct their very own assistive device; students use the Arduino interface to write code to control an ultrasonic sensor. The sensor continually detects objects in its path and lets the user know when he or she is within a given distance from an object by activating a vibrating motor attached to the stick. This project demonstrates how coding and simple circuitry can be used to design solutions to problems such as visual impairment.



## Hard Skills

- Coding
- Circuitry
- Devices & Systems
- Computer Aided Design

## Knowledge

- Biology of Human Vision
- Echolocation
- Structure & Mechanism
- Form & Function

## Soft Skills

- Critical Thinking
- Experimentation
- Problem Solving
- Scientific Communication

## Program Schedule

- Week 1** Introduction to STEAM Engine and Assistive Device Project.
- Week 2** Introduction to computer-aided design (CAD); design 3D objects on computer using FreeCAD.
- Week 3** Using FreeCAD to design parts for the Assistive Device Project.
- Week 4** Introduction to inputs and outputs and basic computer programming using Arduino.
- Week 5** Getting information from the outside world; using buttons to design control systems.
- Week 6** Getting information from the outside world; ultrasonic sensors to design control systems.
- Week 7** Echolocation - combining all learnt knowledge and skills to design the Assistive Device.
- Week 8** Project assembly, testing and debugging, games, discussions & pizza party.



**REGISTER ONLINE by Oct 4, 2019**  
[www.mathstronauts.ca/Get-Involved](http://www.mathstronauts.ca/Get-Involved)