Aerospace & Artificial Intelligence
STEM Program

EDUCATIONAL
PROGRAM

WHO WE ARE

Aviation Connection is a registered charity whose mission is to promote education to Middle and High School students in the field of Science, Technology, Engineering and Mathematics by establishing, facilitating and overseeing a curriculum focused on Aerospace, Artificial Intelligence and Flying Robots in public schools.

EQUAL OPPORTUNITY IN EDUCATION

The Program is offered free of charge and without prerequisites to students and participating public schools, giving equal access to a good quality education regardless of social background, race, gender or religion. The Aviation Connection STEM Program gives an opportunity to students to achieve success in education according to their efforts and ability, free of any form of discrimination. With the STEM Program, some students may develop a fascination with aviation or mechanical engineering, while others may become interested in computer science & Artificial Intelligence. Providing all students access to a course which requires so many varied skills allows them to discover their passion so they can envision themselves in the areas which interest them most.

TURNKEY STEM PROGRAM
Aviation Connection creates, facilitates, implements and oversees the Aerospace & Artificial Intelligence STEM Program offered free of charge & without prerequisites to Middle & High School students starting grade 8 on to High School grade 9 & 10.

STEM EDUCATION SHAPES THE FUTURE

We share a vision

A digital shift is happening at an accelerated pace. Technology and Artificial Intelligence are introduced in every sector of activity. The learning of STEM and A.I. are essential in the development of 21st century skills. STEM education is crucial to meet the needs of a changing world.

Aviation Connection has created an innovative pedagogic model supported by technology that will help develop student skills and understanding of STEM. The quality of the technology used within the Program helps students become better at research and develop critical thinking.

Aviation & AI: The future

inspire and motivate students to excel in their studies. A STEM Program focused on Aerospace, A.I. and Flying Robots will enrich students scientific literacy and bring them right into Science & Technology at the same time. Technology prepares young people to work in an environment full of high-tech innovations. Engineering allows students to enhance problem-solving skills and apply knowledge in new projects.

THE
PROGRAM

THREE options offered as an extracurricular and/or combined with science activities
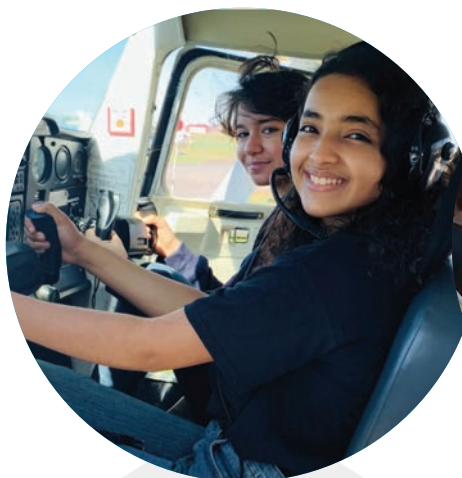
AERO 1
Dynamic of Flight

Students learn:
Aircraft components & instruments
Structure & propulsion
Gravity and load factors
Lift, drag and speed
Flight stability
Flight maneuvers
Speed and pressure
Flight missions to exciting destinations!

Flight simulators installed in the school. 2 students per station.

AERO 2
Construction of RC cargo plane & competition

Students work with the drawings of Aviation Connection aircraft model specially designed and tested to provide the best performance.

The cargo plane competition will determine which school/team deserves the FORTIS prize & reward.

AERO 3
A.I & Flying Robots

Students learn:
Programming with Python.
Use of data-driven approaches.
Collection of training data.
Training of neural networks.
Use of these networks to recognize objects and make the drone react accordingly.

Aviation Connection, in collaboration with software and computer engineering students and professors, has developed a program to teach students the basics of Artificial Intelligence in a fun and accessible way using Flying Robots.

aviationconnection.org

*Visit the website to see the students in action through videos & photos*

AERO 1
Dynamic of Flight

Learning how planes fly exposes students to principles of flight, language, earth science, engineering, physics They learn STEM via engaging in flight simulation experiences: Aviation is the perfect field to introduce STEM subjects. Understanding of changes in weather conditions, understanding the generation of lift under the wings (Physics, Newton's law), calculation of weight and balance (Maths). The flight missions take the students to travel the world (Geography) especially with the use of the newest Microsoft Flight Simulator, named most realistic flight simulator with incredible views of landscape in 'real time'. The Flight Simulator station is composed of a Microsoft Flight Simulator 2020 software, pedals, yoke and controller, 32" TV screen. Equipment is provided free of charge by Aviation Connection. Two students per station.

Aviation Connection instructors are recruited at the nearby Flight School and trained by Aviation Connection to teach the Curricula provided. Instructors are pilots, most are already flight instructors on the way to becoming airline pilots. They share their passion and inspire students to learn. They teach in a way that is fun, dynamic & entertaining to the kids.
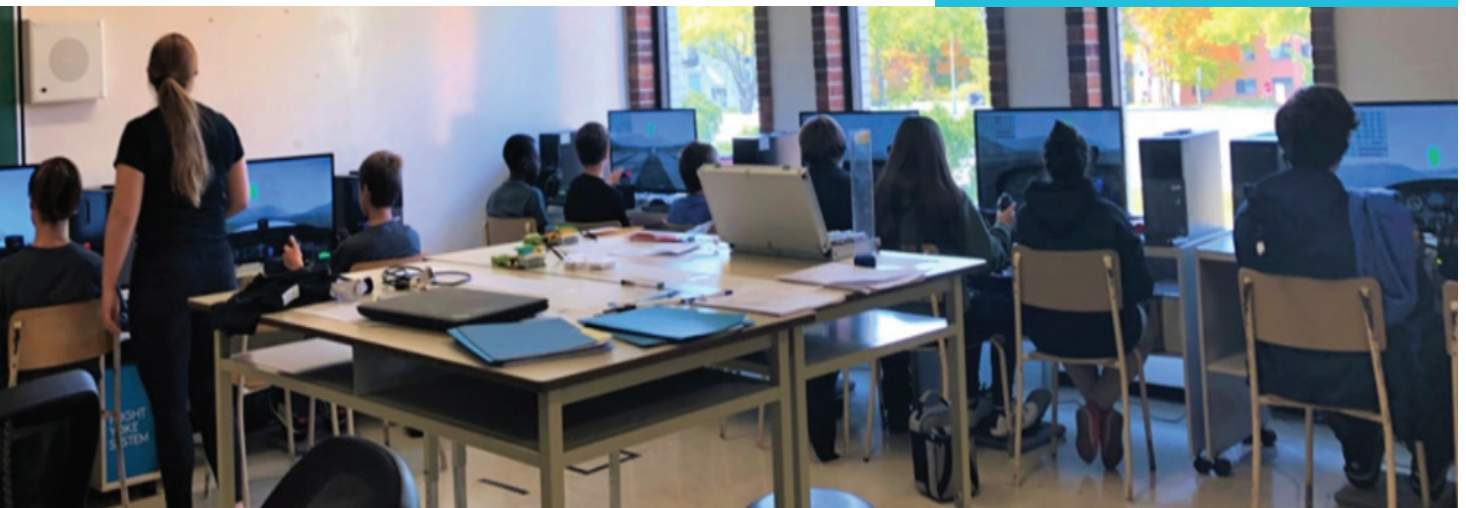
REWARD

Students win points with different quizzes that help monitor their ability to understand the material. Points will generate rewards. A flight at the command of a small aircraft, with flight academy instructor, is offered to best students with highest marks.

AERO 2
Engineering

Offered to students who have acquired a notion on how the planes fly, preferably who have completed AERO1 but not an absolute requirement. A brief introductory course using flight simulators can be provided. Students need to understand how planes fly before they engage in the project of constructing the Cargo RC plane. AERO2, focus is to build 10' RC cargo plane capable of carrying weight, in view of a competition taking place at the end of the year. The project requires students to utilize different skills in the process. In team of 12 to 15 per plane, students hone their teamwork ability. Students, as a team, will get a feeling of great accomplishment once the plane is finished and takes off to the sky !

## A prototype designed for High School students

Aerospace Engineering notions, contributed by professionals, experts in the field, are introduced in the curricula. Students learn how to interact with different components, tools, acquiring an elementary understanding and enthusiasm for engineering.

AERO 3
A.I. & Flying Robots

Offered to students starting age 13. It is primarily taught in the science class during the school year. Aviation Connection, in collaboration with A.I. experts has developed an Artificial Intelligence curricula with which students are able to design simple missions for the Flying Robot based on the principles of Artificial Intelligence: data-driven approaches - Collecting training data - Training neural networks - Using these networks to recognize objects and make the drone react accordingly - Learning to code with the Python language, most popular in the field of A.I. Aero 3 is divided in 3 phases, each composed of 8 courses of 90 minutes each. The first phase is an introduction to programming using small drones. Students starting age 13, learn to write simple lines of code in Python, recognize the different types of values, classes and functions as well as applications to run movement missions and patrols. In the second phase, students will discover the mechanisms and components of the Flying Robots through the building of parts using 3D printing and assembly processes, including solder and calibration. Students will be required to assemble the Flying Robot before they perform exercises that will determine the quality of their work. In the third phase, students use the Flying Robot they built to perform visual recognition missions (IA application) using a Python module named YOLO/COCO and complete certain tasks that involve patrol and recognition of specific objects or persons. A fourth phase is on the works: Flying Robots swarming and drone show.
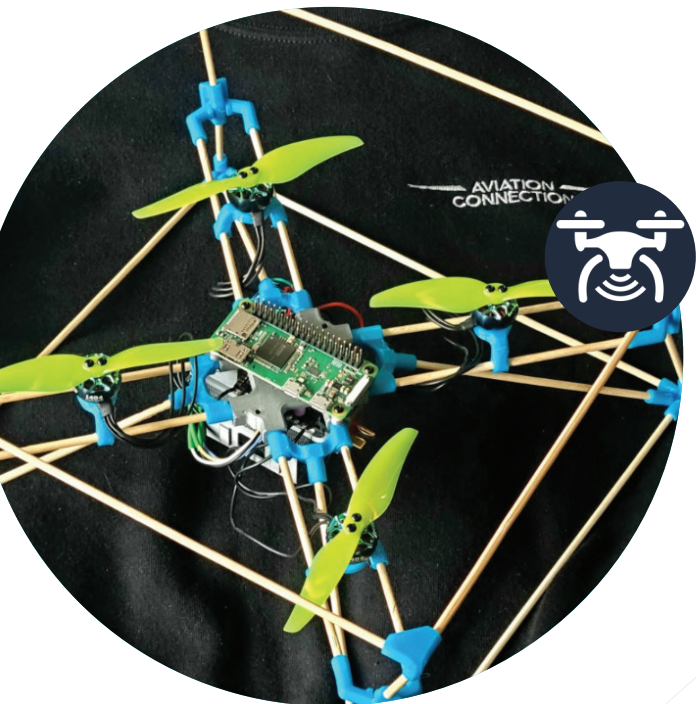
BUILT BY STUDENTS FOR STUDENTS

In a process of innovation, Aviation Connection creates its own Flying Robot, robust, intelligent, safe, perfectly adapted to the learning of Artificial Intelligence in class. Students will receive the components and proceed to assemble from scratch.