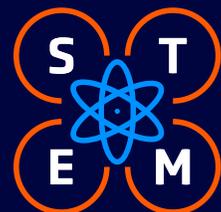# illumia labs

Interactive STEM Programs

For Grades 6 to 9

Cultivating 21st Century Skills through Virtual STEM Education

Our education platform blends virtual technologies and Artificial Intelligence, taking students from grades 6 to 9 on a virtual journey, exploring the principles of **flight, the environment** and, into **space**!

Explore Illumia Labs, where students learn through real-time feedback, problem solving and collaboration.

Camps

Encourage critical thinking and problem solving skills with fun and exciting STEM programs. Youth will be amazed at what they can do!

› **STEM Virtual Field Trip** • 90 mins

After School Programs

Integrate a VR element into your STEM after school program and let students' imaginations take flight.

› **STEM Clubs** • Unique modules on Aviation, Aerospace, Space • 12 -25 hr content/module

An exciting way to enliven existing programs in schools, museums, science centres and more...

We can customize STEM programs for your leaning needs.

With a variety of interactive tools, gamification and AI tutors, there's a world of possibilities with Illumia Labs. Contact us to learn more about customizing STEM programs.

Share stories, educate and provide easy access to transformational learning experiences.

› Students build strong problem solving skills through collaboration, critical thinking, communication and creativity.

› Students apply these newly acquired skills to solve real-world challenges grounded in science, technology, engineering and math content.

› Students take a virtual journey through flight, environment, into space and so much more.

Book a program today!

Visit us at **illumialabs.ai** or call **1.431.668.8886**

Features

A virtual environment limited only by your imagination.

Virtual Campus

Illumia Labs is a virtual campus (also known as a metaverse), which simulates real-life learning communities. When students log in, they can explore Illumia Labs. Like a real public campus, you'll see students and instructors from other walks of life. Students enjoy formal learning environments in the classroom, but can also access the campus 24/7 to meet up with other students to work on projects and socialize. Students are provided direct access to their lab.

Virtual Labs

Designed to deepen engagement, educators can deliver a variety of content such as lectures, videos, presentations, activities and projects. Along with a variety of evaluation tools such as quizzes, tests, simulated examinations, and much more.

Conversational Trainer

Illumia ENAGE is our virtual conversational trainer that, just like a real-life teacher, provides learners with real-time feedback, assesses competencies and identifies knowledge gaps. It also delivers instruction, tips and corrections.

Our pre-designed interactive STEM modules align with common STEM cirricula.

Students build strong problem solving skills through collaboration, critical thinking, communication and creativity.

Students apply these newly acquired skills to solve real-world challenges grounded in science, technology, engineering and math content.

Students take a virtual journey through flight, environment, into space and so much more:

GRADE 6 • Force of Flight

- › Gravity and Lift
- › Bernoulli's Principle
- › Investigating Air
- › Thrust and Drag

GRADE 7 • Aircraft Design

- › Comparing and Evaluating Aircraft Design
- › Different Aircraft Designs
- › Parts of an Airplane
- › History of Aviation

Grade 8 • Components, Energy and Force

- › Comparing and Evaluating Based on Components
- › Energy Sources & Fuel
- › Hydraulic and Pneumatic Systems

Grade 9 • Our Environment & Space

- › Environmental Chemistry
- › Space Exploration

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Grade 6

MODULE 1
Forces of Flight: Gravity and Lift
- › The Evolution of Travel
- › What is Gravity?
- › Gravity and Nature
- › Power and Lift
- › Bernoulli's Principle

MODULE 2
Forces of Flight: Investigating Air
- › Vocabulary
- › What is air?
- › Does air take up space?
- › How does air behave?
- › Air Pressure
- › Density and Buoyant Force
- › Atmosphere
- › Gravity

MODULE 3
Forces of Flight: Thrust and Drag
- › Drag
- › Thrust
- › Propulsion Systems
- › Aircraft and Spacecraft Steering

Stem Focus: Deep focus on science as students explore gravity, lift and Bernoulli's principle. Math application in terms of understanding the formula for force. Understanding engineering within propulsion systems. All learning takes place in a digital environment, offering technological development.

Grade 7

MODULE 1
Aircraft Design: Comparing and Evaluating
- › Comparing Different Uses
- › Interactive Review: Water Bomber CL-415
- › Interactive Review: Spy Plane Lockheed U-2
- › Interactive Review: Transport Plane C295W
- › Agricultural Aircraft Comparison
- › Interactive Review: Helicopter

MODULE 2
Aircraft Design: Different Forms and Functions
- › Monoplane Design: The Blériot X1
- › Triplane Design: The Fokker Dr.I
- › Large Aircraft Design: Airbus A380 & Airbus Beluga
- › High Speed Design: The Concorde

MODULE 3
Aircraft Design: Components
- › General review of parts and components
- › Elevator
- › Rudder
- › Ailerons
- › Aircraft materials and fabrics

MODULE 4
Aircraft Design: History of Aviation
- › Why do we fly?
- › A brief history of aviation in Canada and the world
- › Spaceflight
- › Space Exploration

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Grade 8

MODULE 1
Components, Energy and Force: Component Comparison

› What makes for a good machine?
› Evolution of Commercial aircraft
› Machine Efficiency
› Environmental Impacts

MODULE 2
Components, Energy and Force: Energy Sources

› What is Energy?
› Types of Energy
› Energy Sources and Fuel
› Fuel to Thrust
› Types of Propulsion
› Future of Aircraft

MODULE 3
Components, Energy and Force: Hydraulic and Pneumatic Systems

› What are Hydraulics and Pneumatics?
› Control Systems
› Hydraulic Advantages
› Pascal's Law
› Video: Hydraulic Systems in an Aircraft

MODULE 4
Components, Energy and Force: Simple Machines

› What is a Simple Machine?
› Parts of an Aircraft
› Control Systems
› Video: Control Surfaces
› Flight Control Systems
› Landing Mechanisms

Grade 9

MODULE 1
Environment and Space: Environmental Chemistry

› Measuring Substances
› Substrates and Nutrients
› Biological Monitoring
› Chemical Factors of an Environment
› Measuring Concentrations
› Acids, Bases and Neutrals
› Biodegradation
› Hazardous Chemicals

MODULE 2
Environment and Space: Space Exploration

› Technology and Science
› Celestial Bodies
› Technological Advancements
› Distribution of Matter
› Our Solar System
› Objects: tracking them through space
› Challenges and technology for life in space
› Traveling to space
› Satellites
› Space Exploration
› Rockets
› Astronauts
› Space and Aviation

FAQs

What equipment/technology do we require?

Please see the chart below for the best browsers and web speeds to consider when using our metaverse:

WEB BROWSERS	
Mac, iPhone, iPad	Use the latest Safari version
PC, Chromebook, Android	Use the latest Google Chrome
VR	Use Firefox for HTC Vive, or Valve Index Use the Oculus Browser for the Oculus Quest

INTERNET CONNECTION

Our platform requires a broadband wired or wireless connection. Minimum bandwidth is 3 Mbps (up/down) and recommended is 10 Mbps (up/down). The more people in your Frame, the higher connectivity speed is required for a smooth experience.

OPERATING SYSTEM	
Mac, iPhone, iPad	OSX or iOS/iPadOS 13 +
Android	Android 8 or later
PC	Windows 7 or above

MIC/HEADSET

You need a microphone, and we strongly recommend headphones to help reduce feedback or echo.

How do I book a program?

To book a program, please reach out to us at **info@illumialabs.ai**. We will schedule you for a tour of Illumia Labs and our metaverse, so you can experience the modules and interactive experiences first hand.

With our wide array of interactive modules, it's important we learn about you and how we can best help you deliver programs to your students and guests. This custom-tailored approach ensures your version of Illumia Labs is perfect for your needs.

We excel at:

› After school and weekend programs
› School field trips
› Seasonal camps
› Interactive guest experiences
› Tour and rental augmentation

How far in advance do I need to book?

Booking a tour for Illumia Labs is very quick. We can have you and your team ready in as little as a few days (based on availability).

Loading your curated choice of programs as well as adding custom content can be as quick as a week or as long as a month, depending on the level of customization being requested and added to the interactive metaverse.

Book a program today!

Visit us at **illumialabs.ai** or call **1.431.668.8886**

How long is each module?

It depends on how the materials are used and presented. We know that many teachers and students have reported back close to 40 hours of learning and use when combined with a class and group interaction. Individually, there are hours of exploration and learning available with just Illumia ENGAGE.

Is there a limit on student participation?

There are currently limits of 15 in our virtual labs, but we can accommodate groups of 100 or more upon request, allowing us to collaborate with large and multiple group sizes. Your participation would be limited only to the number of devices you are using at your museum (laptops, desktops, or VR headsets).
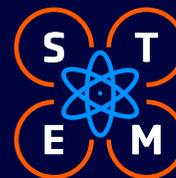
Is student information secure?

We take student information and security as one of our highest priorities. All our students complete online forms before entering into our metaverse, to ensure we have permission and understanding in place before beginning the program.

Once online, all user information is encrypted and protected to ensure no outside users can compromise personal information.

About Us

Illumia Labs collaborates closely with non-profit organizations and educational institutions to enrich STEM-based offerings. Illumia Labs delivers cutting-edge technology solutions that transcend the barriers of place and time, revolutionizing the accessibility and affordability of STEM education. Through our transformative approach, organizations can elevate their learning experiences to unparalleled heights, igniting a passion for STEM careers in students. Together, we are forging the learning tools of the future.

illumia labs

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