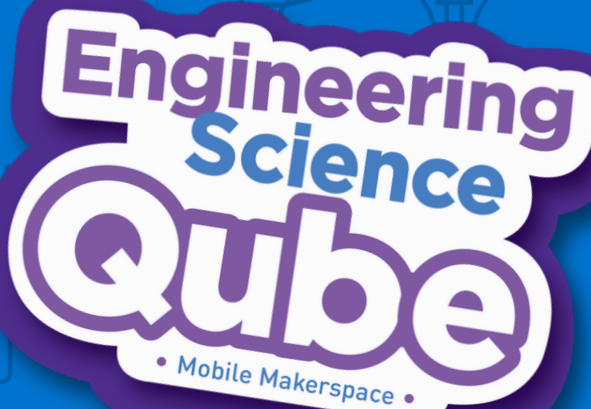




SCHOOL WORKSHOPS

ESQube is an in-school workshop initiative operated by the Engineering Outreach team at the University of Waterloo. We are strong believers that sparking appreciation for Science, Technology, Engineering, and Math (STEM) at an early age is valuable, and ESQube wants to give ALL youth the opportunity to engage in these hands-on experiences.

ESQube is excited to offer FREE STEM workshops to students in Kindergarten to Grade 8. Look inside at our offerings and let us know if there are any programs your school may be interested in hosting.

WORKSHOPS

**Grades
K - 8**

TOPICS

★ **New!**

Grade	DIGITAL SKILLS & MATH	ENGINEERING DESIGN + BUILD	SCREENLESS CODING
Kindergarten	SHAPE SAFARI (K-2)	KINDER-STEM	
PRIMARY Grade 1-3	OZOCITY BUILDERS ★	TWISTER HIDEOUT	MATATA ECOSYSTEMS
JUNIOR Grade 4-6	MICRO:BIT MESSENGERS	IN BRIDGES WE TRUSS	MATATA ARTISTS
	FRAME FLIPPIN' FUN		
	A BIT OF AI! ★		
INTERMEDIATE Grade 7-8	AI GRID GUARDIANS ★	WATTS IN THE WIND	
	DIGITAL DAVINCI	BUILD, SCRAP, REPEAT	
		PITCH BLACK ★	

- All workshops (except Kinder STEM) run for 60 minutes and are designed for a maximum of 30 students
- All CODING workshops (except Shape Safari and Ozocity Builders) require students to have their own laptop/Chromebook with internet access
- A Bit of AI requires laptops with Bluetooth capability
- All materials will be provided for DESIGN + BUILD and SCREEN-FREE DIGITAL SKILLS workshops
- All workshops are altered with simplifications and extensions to best support learning at each grade level

CODING & MATH



Shape Safari | Grade K-2

Students will explore the connections between math and nature through reading an exciting story about the many different shapes in nature. Students will then design and build an animal shelter using as many shapes and patterns as possible!

Curriculum Links: Language (C2), Math (C1, E1), Science and Technology (B2)

OzoCity Builders | Grade 1-3

Students will step into the role of city planners and engineers as they design and build their very own city! Using Ozobots – tiny robots that we can code! – students will map out roads, buildings, parks, and more, creating a vibrant city landscape. They'll use block codes to program their Ozobot to navigate through their city, learning the basics of coding and problem-solving along the way.

Curriculum Links: Engineering (A1), Coding (A2), Global & Local Communities (B1-3)

Micro:bit Messengers | Grade 4-6

Students will use block coding to program Micro:bits and explore how radio signals work by sending secret messages to their peers. This workshop will highlight the importance of cybersecurity and reinforce awareness of digital footprints.

Curriculum Links: Coding (A2), Applications (A3)

Frame Flippin' Fun | Grade 4-6

Students will learn about digital screens and optics by using block coding and micro:bits to create animations. Students will also explore computer logic, inputs/outputs and hardware during this workshop with fun micro:bit challenge cards!

Curriculum Links: Coding (A2), Visual Art (D1)

A Bit of AI! | Grade 4-6

Students will use Micro:bit CreateAI to explore machine learning by collecting movement data, training a model to recognize actions like walking and jumping, and testing how well their micro:bit can identify different movements. They'll also experiment with their micro:bits to discover creative ways to use AI and see what cool things they can make them do!

Curriculum Links: Coding (A2), Applications (A3)

AI Grid Guardians | Grade 6-8

Students become utility engineers, training an AI model to identify renewable energy technologies, grid equipment, and weather-related hazards. Through testing and retraining, they discover how AI learns from data and how it can help keep the electricity grid safe and resilient.

Curriculum Links: Coding (A2), Engineering Design (A1), Artificial Intelligence & Digital Technologies, Sustainability and Energy Systems.

Digital DaVinci | Grade 7-8

Students will create computer programs which generates dynamic pieces of art. Using the same algorithm used for CGI in movies and video games, students will explore how colour, geometry, and images translate into digital spaces, and draw connections between patterns in art and mathematics.

Curriculum Links: Coding (A2), Programming (B1), Visual Art (D1)



ENGINEERING: DESIGN + BUILD



Kinder-STEM | Kindergarten

Students will be introduced to STEM - Science, Technology, Engineering and Math. Students will apply their learning by participating in fun STEM related challenges and games!

Twister Hideout | Grade 1-3

Students will learn about tornadoes, safety procedures, and the importance of building strong, stable shelters. They will then apply this knowledge using the engineering design process by constructing a sanctuary for an animal using various design materials.

Curriculum Links: Engineering (A1), Structures and Mechanisms (D2)

In Bridges We Truss | Grade 4-6

Students will become civil engineers by designing and building their own truss bridge using craft materials. Once it's complete, students will test how much weight it can hold before it breaks! Can their bridge handle the challenge? Let's find out!

Curriculum Links: Engineering (A1), Structures and Mechanisms (D1)

Watts in the Wind | Grade 7-8

Working in groups, students will design and build their own electrical wind-turbine and quantify how much voltage can be generated, all while learning about renewable energy, and using the engineering design process!

Curriculum Links: Engineering (A1), Matter & Energy (C1 & C2)

Build, Scrap, Repeat | Grade 7-8

Students will encounter the ultimate engineering challenge: using the same set of materials to solve three different problems. By applying the engineering design process and working together, they will present their prototypes and impress the judges!

Curriculum Links: Engineering (A1), Structures and Mechanisms (D1)

Pitch Black | Grade 7-8

Students learn fundamental circuit concepts and build simple electrical circuits using breadboards, batteries, resistors, and LEDs. In a community power outage challenge, they apply their engineering skills to prioritize essential services and restore electricity efficiently.

Curriculum Links: Engineering (A1), Applications (A3), Structures and Mechanisms (D1)

SCREEN-FREE



Matata Ecosystems | Grade 1-3

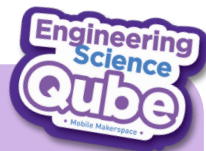
Using the Matata Studio Coding Set—a screen-free, hands-on block coding toolkit—students will explore a variety of ecosystems as they code their way through exciting challenges. With thinking caps on and problem-solving in full gear, students will navigate obstacles, plan routes, and bring their coding adventures to life in a fun, tactile way.

Curriculum Links: Coding (C3), Life Systems (B2)

Matata Artists | Grade 4-6

In this creative coding challenge, students will become artists and engineers as they use the Matata Studio Coding Set – a screen-free, hands-on block coding toolkit – to design geometric masterpieces! By programming precise turns and movements, they'll explore angles, patterns, and spatial reasoning—proving that math and art make the perfect pair.

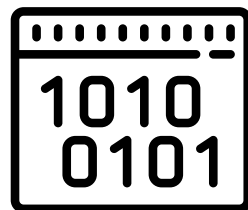
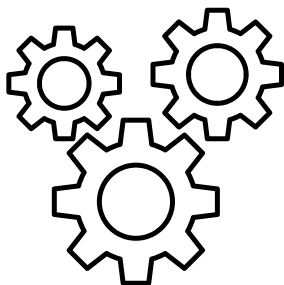
Curriculum Links: Coding (C3), Spatial Sense (E1), Visual Art (D1)



BOOK NOW!

Schedule workshops for your school today using our online booking portal:

- Book through our Calendly Portal – link found on the ESQube webpage!
- Select an available day that fits your schedule
- Answer all the questions to provide us with info about each class you wish to book
- You will receive a booking confirmation from Calendly, and our ESQube Team will reach out by email to finalize the booking with you.
- **Note: It is our goal to reach as many youth as possible. Please work with your colleagues to fill the daily schedule. One workshop per class.**



FAQ's ?

Is there a cost to book an ESQube School Workshop?

A: All workshops are provided for FREE within the program areas, noted below.

Where are the ESQube program areas?

A: ESQube workshops are delivered only to schools in Waterloo Region (Cambridge, Kitchener, Waterloo and Townships) & surrounding counties in Huron, Oxford and Perth within a 1-hour drive of UWaterloo Waterloo Campus. If you are unsure if your school qualifies, please email us with your school's name and address.

How long is a session?

A: Grade 1-8 workshops require a 60 minute time slot. Kinder-STEM workshops are 30-40 minutes.

How many workshops can I book in a single school day?

A: This will depend on your school's daily schedule and how much travel is needed but we aim to schedule 3-4 workshops in a day.

How many days can my class book?

A: To ensure we are reaching as many classes as possible, we ask that classes book a maximum of one workshop each school year (Sept 2026 - June 2027).

How many students can participate in one session?

A: In order to ensure each student's learning can be supported by our two-person teaching team, we suggest booking single classes of up to 30 students per session.

ANY OTHER
QUESTIONS?



engoutreach2@we-connect.ca for ESQube booking questions, or engoutreach@uwaterloo.ca for general inquiries

WAIT...THERE'S MORE

UW Engineering Outreach offers a range of other programs for students of all ages including:

- 'Kids On Campus' field trips to UW for Grade 4 classes
- STEM Nights at your school for all students and their families
- After school programs at UW and in the community
- March Break, PD Day & Summer STEM Camps for learners of all ages

Visit uwaterloo.ca/engineering-outreach for details!

Stay updated by signing up to our mailing lists:

Engineering Outreach Teacher Mailing List:

mailchi.mp/uwaterloo/weo-educator-mailing-list

Engineering Outreach General Mailing List:

mailchi.mp/uwaterloo/engineering_outreach

ESQube School Workshops are supported by:

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