

York University | Science Engagement

# IN-SCHOOL WORKSHOPS

*Making  
Science  
Fun!*



science



**For Grades 3 to 8**

# Bring STEM Alive in Your Classroom!

At Science Explorations, our objectives align directly with yours! Our In-School Workshops are designed to excite youth about STEM and ignite a genuine passion for learning. Our hands-on workshops complement your regular classroom instruction and directly support the learning expectations of the Ontario Elementary Curriculum.

## Our Hands-On Approach

Our high-energy and interactive workshops use a hands-on, discovery-based approach to learning. Students work in teams through guided projects and experiments to gain an understanding of abstract STEM concepts. Our instructors also share related scientific research taking place at York University and discuss real-world applications of topics, making the learning relevant to the students' day-to-day lives.

## Our Instructors

Our team consists of enthusiastic undergraduate science and engineering student instructors. They have an infectious passion for STEM, magnetic personalities, and a genuine desire to inspire youth. In addition to STEM subject matter expertise, our instructors have extensive training in pedagogy, best practices in teaching and instruction, effective classroom management and conflict resolution. They also have training in community building, diversity, and inclusion. Our team reflects the diversity of today's GTA classrooms – meaning they make for great role models for your students!

### A PROUD MEMBER OF ACTUA

Actua is a national organization of 33 university-based STEM outreach programs. Our pedagogical approach is shared by Actua members across Canada, and has been rigorously tested and evaluated. This approach is based on the supposition that the skills, knowledge, and attitudes of scientifically literate people are the same skills, knowledge, and attitudes of 21st century thinkers and leaders. This means that regardless of whether or not a child pursues a STEM field, developing these STEM skills will help better prepare them for the future.

### ABOUT THE FACULTY OF SCIENCE

York University is proud to have one of the leading Faculties of Science in Canada. The Faculty is an emerging research powerhouse and is home to 140 professors, many of whom are recognized internationally as leaders in their fields. The Faculty has particular research strengths in the areas of genetics, neuroscience, regenerative medicine, astrophysics, pharmaceutical chemistry, epidemiology and mathematical disease modeling, computational biology, high-energy and particle physics, ecology and evolutionary biology, atmospheric chemistry, and actuarial science.

For more visit: [science.yorku.ca](http://science.yorku.ca)

## What GTA Teachers Say About Our Workshops:

*“The students enjoyed themselves today! They had fun building and test flying their planes too! Overall, it was well presented and organized.”*

**MS RIELLY**  
GRADE 6 TEACHER - FERNFOREST PS

*“The workshops were very engaging and educational for the students. Instructors were good at probing students to answer questions and take part in the lesson.”*

**MRS GURRERI**  
GRADE 7 TEACHER - OUR LADY OF THE ROSARY

**“The instructors worked well together to transfer their love of science to the students. Well done to the York Faculty of Science for such a quality program!”**

**MS LUCIANI**  
GRADE 5 TEACHER - OUR LADY OF PEACE

**“Highly engaging, hands-on—Fun!”**

**MR LEMOINE**  
GRADE 8 TEACHER - ADRIENNE CLARKSON PS

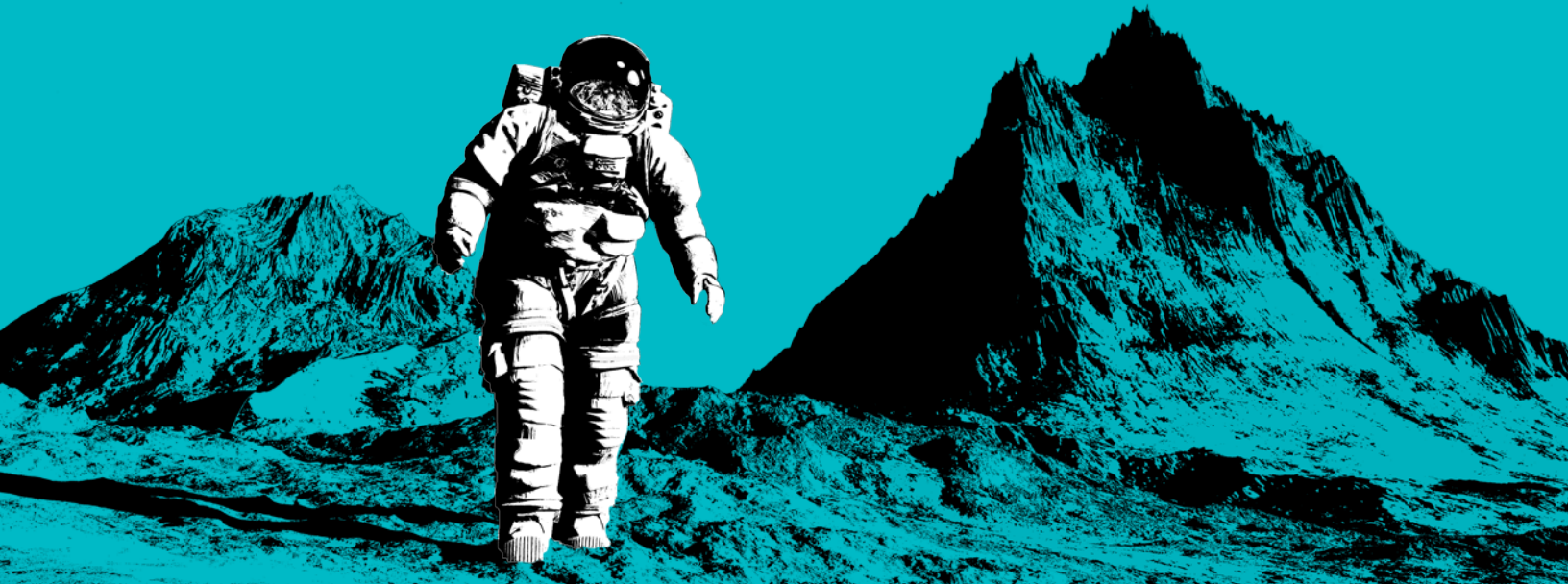
*“The workshop was very informative and easy to understand. Hands-on! Kids love that!”*

**MRS GILL**  
GRADE 7 TEACHER - GREAT LAKES PS

*Workshops  
make a great  
in-class field  
trip!*

# SPACE + EARTH SYSTEMS

IN-SCHOOL  
WORKSHOPS



**GRADE 3** ⌚ 1–1.5 Hours

## Terrarium

Students will design and build a terrarium to explore concepts of the water cycle, plant growth and ecosystems.

**ONTARIO CURRICULUM CONNECTION**  
Soils in the Environment

**GRADE 4** ⌚ 1–1.5 Hours

## Eroding the Earth

Students will investigate the effects of physical and chemical erosion.

**ONTARIO CURRICULUM CONNECTION**  
Rocks and Minerals

**GRADE 5** ⌚ 1.5–2 Hours

## Photovoltaic Solar Cells

Students will design and construct solar powered cars.

**ONTARIO CURRICULUM CONNECTION**  
Conservation of Energy and Resources

**GRADE 6** ⌚ 1–1.5 Hours

## Astronomy + Astrophysics

Students will construct a model of our solar system.

**ONTARIO CURRICULUM CONNECTION**  
Space

**GRADE 7** ⌚ 1–1.5 Hours

## Thermos

Students will investigate the properties of different materials and their ability to retain, transfer, repel and absorb heat.

**ONTARIO CURRICULUM CONNECTION**  
Heat in the Environment

**GRADE 8** ⌚ 1.5–2 Hours

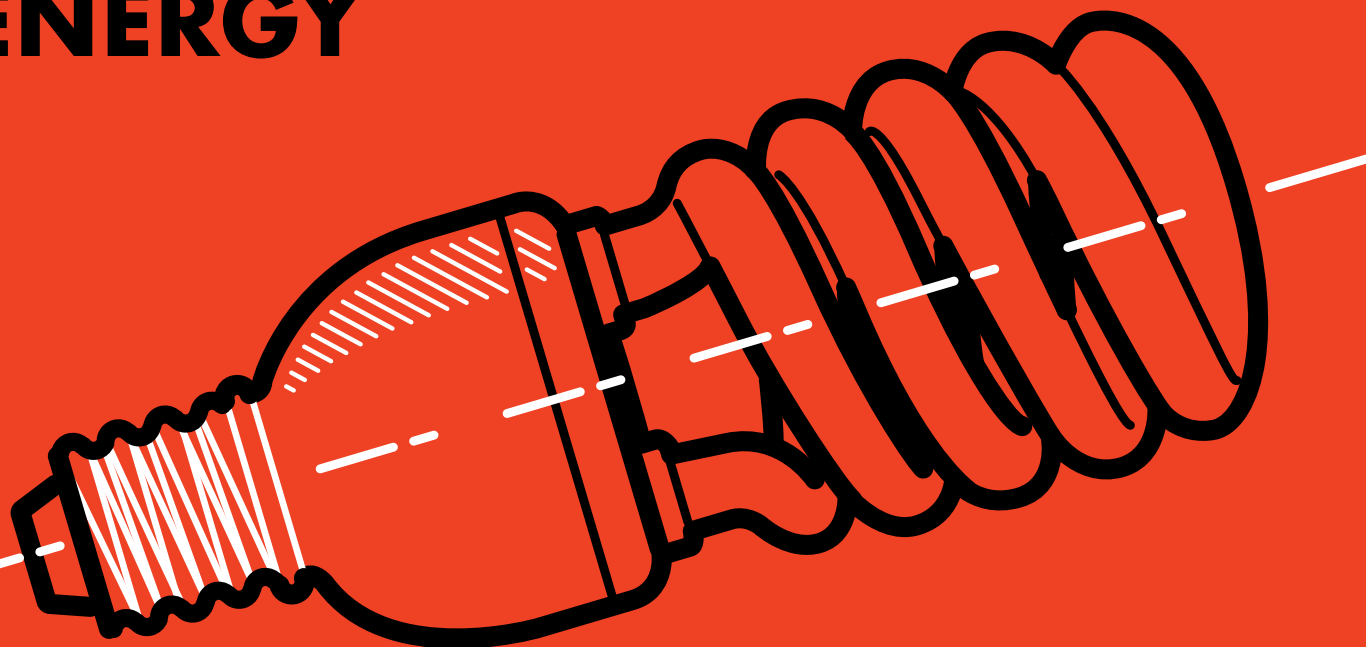
## Water Filtration

Students will construct water filtration devices and investigate how improper disposal of harmful contaminants has serious impact on animal and human health.

**ONTARIO CURRICULUM CONNECTION**  
Water Systems

# MATTER + ENERGY

IN-SCHOOL  
WORKSHOPS



**GRADE 3** ⌚ 1–1.5 Hours

## Fun Friction

Students will design, build and test cars to investigate the laws of physics.

**ONTARIO CURRICULUM CONNECTION**  
Forces Causing Movement

**GRADE 4** ⌚ 1–1.5 Hours

## EYE-R

Students will learn about different forms of electromagnetic radiation and its harmful effects on the human eye.

**ONTARIO CURRICULUM CONNECTION**  
Light and Sound

**GRADE 5** ⌚ 1–1.5 Hours

## Awesome Ooze

Students will use their knowledge of chemistry to synthesize various polymers.

**ONTARIO CURRICULUM CONNECTION**  
Properties of and Changes in Matter

**GRADE 6** ⌚ 1.5–2 Hours

## Circuit City

Students will use knowledge of electricity to design, build, and test circuits.

**ONTARIO CURRICULUM CONNECTION**  
Electricity and Electrical Devices

**GRADE 7** ⌚ 1–1.5 Hours

## CSI: Classroom Scene Investigation

Students will investigate principles of chemical reactions in a mock crime scene.

**ONTARIO CURRICULUM CONNECTION**  
Pure Substances and Mixtures

**GRADE 8** ⌚ 1.5–2 Hours

## Hydraulic Cranes

Students will integrate their knowledge of fluids and systems in action to create a hydraulic crane.

**ONTARIO CURRICULUM CONNECTION**  
Fluids

# STRUCTURES + MECHANISMS

IN-SCHOOL WORKSHOPS

**GRADE 3** ⌚ 1.5–2 Hours

## Pasta Bridges

Students will design and test the load-bearing function of pasta bridges.

**ONTARIO CURRICULUM CONNECTION**  
Strength and Stable Structures

**GRADE 4** ⌚ 1.5–2 Hours

## Super Simple Machines

Students will learn to combine and construct super simple machines.

**ONTARIO CURRICULUM CONNECTION**  
Pulleys and Gears

**GRADE 5** ⌚ 1–1.5 Hours

## Tables + Towers

Students will design, build, and test towers to withstand various environmental factors.

**ONTARIO CURRICULUM CONNECTION**  
Forces Acting on Structures and Mechanisms

**GRADE 6** ⌚ 1–1.5 Hours

## Fantastic Flight

Students will investigate principles of flight in flying animals and apply these concepts to design and build their own gliders.

**ONTARIO CURRICULUM CONNECTION**  
Flight

**GRADE 7** ⌚ 1.5–2 Hours

## Functional Forms

Students will design and construct working models of shoes to investigate concepts and principles of human factors and industrial engineering.

**ONTARIO CURRICULUM CONNECTION**  
Form and Function

**GRADE 8** ⌚ 1.5–2 Hours

## Rockin' Rollercoasters

Students will design and construct models of rollercoasters to investigate the laws and principles of physics.

**ONTARIO CURRICULUM CONNECTION**  
Systems in Action

# LIFE SYSTEMS

IN-SCHOOL  
WORKSHOPS



GRADE  
**3**

⌚ 1–1.5 Hours

## Colorful Carnations

Students will learn about uptake and water retention within different types of plants.

**ONTARIO CURRICULUM CONNECTION**  
Growth and Changes in Plants

GRADE  
**4**

⌚ 1.5–2 Hours

## Animal Adaptations

Students will investigate the principles of evolution and build models of animals adapted to various environments.

**ONTARIO CURRICULUM CONNECTION**  
Habitats and Communities

GRADE  
**5**

⌚ 1–1.5 Hours

## Living Lungs

Students will design and build a working model of the respiratory system.

**ONTARIO CURRICULUM CONNECTION**  
Human Organ Systems

GRADE  
**6**

⌚ 1.5–2 Hours

## Feathered Foragers

Students will apply their knowledge of taxonomy to identify and classify animals within appropriate food webs and ecosystems.

**ONTARIO CURRICULUM CONNECTION**  
Biodiversity

GRADE  
**7**

⌚ 1–1.5 Hours

## Energy + the Environment

Students will learn to construct animal food webs while investigating the effects of pollution through biomagnification.

**ONTARIO CURRICULUM CONNECTION**  
Interactions in the Environment

GRADE  
**8**

⌚ 1–1.5 Hours

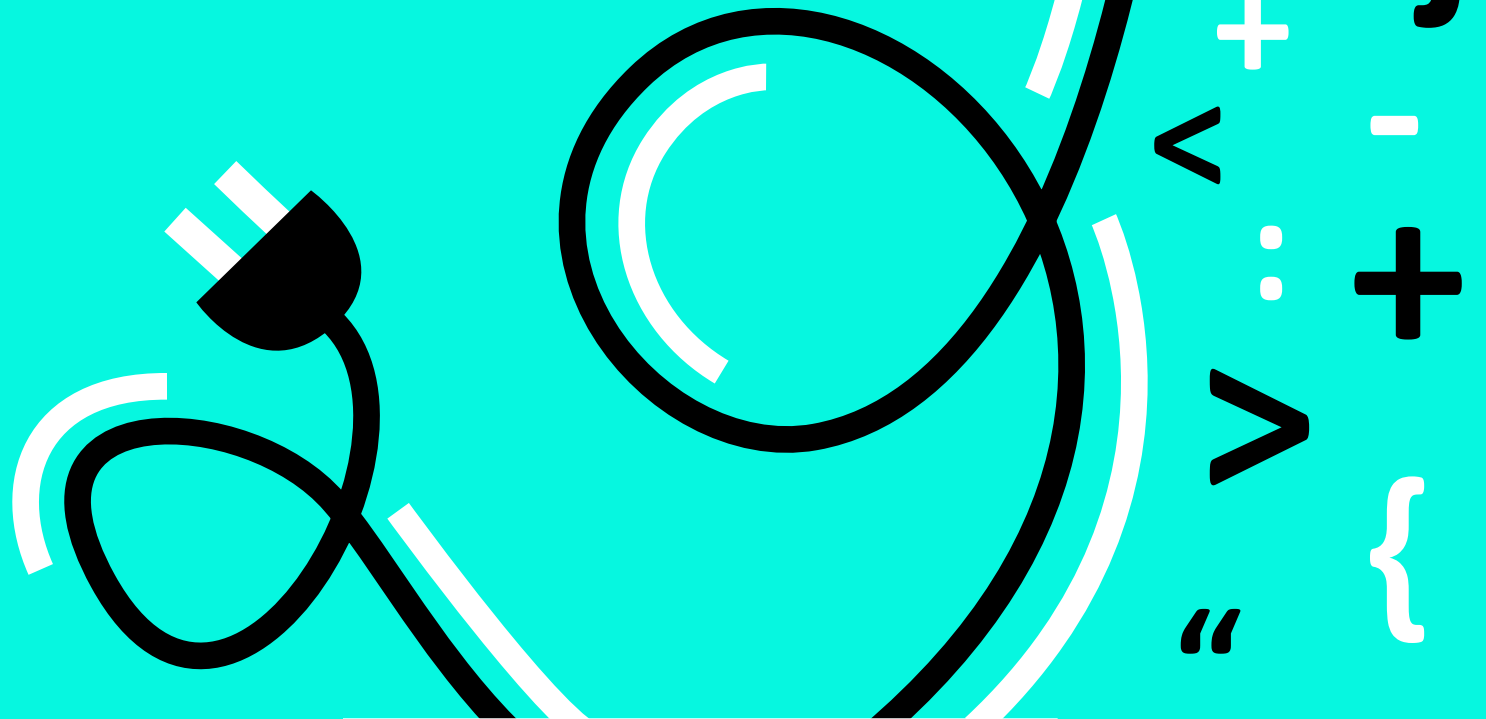
## Bacteria Biology

Students will construct models of bacteria and compare them to cells within the human body.

**ONTARIO CURRICULUM CONNECTION**  
Cells

# UNPLUGGED

IN-SCHOOL  
WORKSHOPS



Unplugged workshops are screen-free workshops that teach Computer Science in an engaging and hand-ons way. These activities introduce students to the logic behind computer programming, languages, and concepts without the need for any computers!

GRADES  
3 - 8

⌚ 1.5–2 Hours

## Coding with Colours

Students will investigate about the use of colour in computer science through Ozobots and computer-generated sprites.

GRADES  
3 - 8

⌚ 1–1.5 Hours

## My Robotic Friend

Students will explore how computers work by modelling computer functions and learning about programming logic.

# K to 12 STEM Outreach

The Faculty of Science at York University has a long history of supporting K-12 STEM outreach in the GTA. In 2014 we reached more than 7,000 youth through our programming. In addition to In-School Workshops, we offer programs throughout the year to engage youth about STEM:

**SciX: Science Explorations Summer Camp**  
Grades 3-8 — Summer

**York Science Saturdays**  
Grades 3-12 — Fall/Winter

**March Break Science Camp**  
Grades 3-8 — March Break

**Spark Lab Program**  
Grades 9-12 — Summer

# Science Explorations is a proud member of Actua

A member organization of [www.actua.ca](http://www.actua.ca)

**actua**™

Learning for Change.  
Découvrir pour demain.

Actua provides training, resources and support to its national network of members located at universities and colleges across Canada in the delivery of science, technology, engineering and mathematics (STEM) education outreach programming. Each year these members engage over 225,000 youth in 500 communities nationwide. Please visit Actua at [www.actua.ca](http://www.actua.ca)

#### 2014 ACTUA ONTARIO FUNDERS

Ontario Trillium Foundation

#### 2014 ACTUA NATIONAL FUNDERS

Suncor Energy Foundation

GE Canada

Natural Sciences and Engineering Research Council of Canada

Shell Canada

## York University Science Engagement

# IN-SCHOOL WORKSHOPS

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