

SCIENTISTS IN SCHOOL™

2016-17 WORKSHOP CATALOGUE

Kindergarten to Grade 8 science, technology, engineering and math (STEM) programs



**PETERBOROUGH AND THE KAWARTHAS,
NORTHUMBERLAND, VICTORIA, CLARINGTON
AND SIMCOE COUNTY**



Book online at scientistsinschool.ca. Book early to get your preferred topic and date.

Since 1989, Scientists in School™ has inspired elementary students and teachers to explore and investigate science, technology, engineering, math, and the environment through fun workshops where students become the scientists. Our presenters have expertise in different STEM fields, and extensive experience working with children.

Our workshops:

- ✓ Are inquiry-based and hands-on
- ✓ Are half-day, in-class
- ✓ Enrich and extend the science, technology and math curricula
- ✓ Help to develop critical thinking, problem-solving and teamwork skills

How to Book a Workshop:

1. Choose your topic(s).
2. Book online (scientistsinschool.ca) or fax/mail this booking form to:
NEW ADDRESS
 Scientists in School
 975 Dillingham Road, Unit 2
 Pickering, Ontario L1W 1Z7
 905-837-9626/1-866-678-3434
 Fax: 905-837-8495
eco@scientistsinschool.ca
3. Mail in your deposit of \$25 per workshop – if booking by mail, send your cheque with this form. If booking online, mail your cheque with a copy of your e-confirmation. Please make cheques payable to: **Scientists in School.**
4. Your presenter will contact you within three weeks to schedule a date. Book early to ensure that you get your preferred day.

Other Information:

Maximum class size: To ensure every child gets a hands-on experience, the maximum number of students is 30.

Allergy Advisory: Our presenters bring many different materials into the classroom. While we regularly maintain our workshop kits for cleanliness and safety, we cannot guarantee they are free from all allergens. Please advise us of any known allergies or special restrictions.

Booking Terms, Conditions and our Cancellation Policy can be found at scientistsinschool.ca/policies.

Application Date: _____ Board: _____

Tel: _____ Fax: _____ School: _____

BOOKING #1

Teacher: _____ Grade: _____ Class Size: _____

Email: _____ Preferred Month: _____

Topic: _____ Time: A.M. P.M.

Alternate Topic: _____ Time: A.M. P.M.

Special Notes: _____

Yes! Please add me to your email database to receive updates from Scientists in School.

BOOKING #2

Teacher: _____ Grade: _____ Class Size: _____

Email: _____ Preferred Month: _____

Topic: _____ Time: A.M. P.M.

Alternate Topic: _____ Time: A.M. P.M.

Special Notes: _____

Yes! Please add me to your email database to receive updates from Scientists in School.

BOOKING #3

Teacher: _____ Grade: _____ Class Size: _____

Email: _____ Preferred Month: _____

Topic: _____ Time: A.M. P.M.

Alternate Topic: _____ Time: A.M. P.M.

Special Notes: _____

Yes! Please add me to your email database to receive updates from Scientists in School.

BOOKING #4

Teacher: _____ Grade: _____ Class Size: _____

Email: _____ Preferred Month: _____

Topic: _____ Time: A.M. P.M.

Alternate Topic: _____ Time: A.M. P.M.

Special Notes: _____

Yes! Please add me to your email database to receive updates from Scientists in School.

Thank you for booking a Scientists in School™ workshop.
Contact us at any time to check on the status of your booking.

2016-17 SCIENTISTS IN SCHOOL™ CLASSROOM WORKSHOPS

Book your workshop today at scientistsinschool.ca or by using the provided booking form

KINDERGARTEN

BACKYARD BUGS

'Bee' an entomologist. Meet the insect family and discover their unique anatomy. Develop a new appreciation of bugs by investigating how they behave, eat and see. Act out the life cycle of a butterfly. See the world through the eyes of a fly. Help some bugs play hide and seek using camouflage. Identify interesting backyard bugs, observe some live bugs and make an insect to take home.

I CAN BE A SCIENTIST

Become a working scientist. Dig for dinosaur bones and make a fossil as a paleontologist. Explore the weather as a meteorologist while making it rain in the classroom. Become an astronomer and discover the Big Dipper in our constellation tent. Use a lab coat and safety goggles to find the solution as a chemist. Make a fish print, examine ocean specimens and track killer whales as a marine biologist.

NEW! SENSATIONAL SCIENCE

Explore your senses and investigate how they help you see the world. Participate in our taste test while exploring the interconnection of taste and smell. Match items using just your sense of hearing. Experiment with your fingers while investigating the contents of a mystery bag, explore the connection between light and sight by looking through different objects. Find out how our sense of smell protects us as we classify smells as good, bad or dangerous.

SIMPLY MARVELLOUS MACHINES

Discover how often you use simple machines in everyday life by playing with an amazing number of tools. Find simple machines at the playground as you slide down an inclined plane, dig with a wedge, make a teeter-totter to take home and race with wheels and axles. Explore how to make bubbles using gears, discover that wedges have edges and investigate the mechanical advantage of using levers.

THERE'S NO PLACE LIKE HOME!

Follow the footprints and other clues to find the home of the mystery animal. Develop a life-long respect for the environment by learning about a variety of habitats. Build a nest in a tree using just your beak. Slither like a snake or dig like a mole through your underground tunnel.

WATER FUN FOR KINDERGARTEN SCIENTISTS

Foster an enjoyment of exploration with this water park adventure. Participate in our 'soak it up challenge' to investigate which materials absorb water. Explore buoyancy by experimenting with objects that float or sink. Marvel at the elusive shape of water and explore its magical properties. Puzzle out how we use water in our daily lives. Discover how a lock system works while you row, row, row your boat up our classroom stream.



"Fantastic, hands-on program! The instructors are knowledgeable and really engage the children. I book them every year and I am never disappointed! A must for every grade."

- Kindergarten Teacher, Kawartha Pine Ridge District School Board after *Backyard Bugs*

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GRADE ONE

ANIMAL COVERINGS AND ADAPTATIONS

Combined Grade Content | For Grades 1 & 2

How does beaver fur feel compared to raccoon fur? What does a butterfly wing really look like? Why do porcupine quills work so well as a defense? Explore some of nature's most unusual coverings including feathers, shells, scales, quills and fur. Investigate the unique properties of a variety of animal coverings and discover some of the amazing adaptations animals have to survive their environment and seasonal changes.

ENERGY MAKES IT HAPPEN

Matter & Energy

Explore the impact energy has on our daily lives. Investigate thermal energy by making a bubble grow. Use a real thermometer to explore the effect of colour on heat absorption. Build a pinwheel that uses renewable energy. Become an energy wizard as you conserve energy in your house. Unleash your inner Picasso and create abstract paintings using solar power.



NEVER SAY UGH TO A BUG

Life Systems

Develop a new appreciation of bugs as an entomologist. Examine a variety of living and preserved invertebrate specimens. Investigate bug behaviours and habitats and become an insect to find other members of your colony. Explore insect life cycles and learn how they differ from other invertebrates. Discover the benefit and beauty of bugs.

STRUCTURES: UNDER CONSTRUCTION

Structures & Mechanisms

Join our engineering team and build a structure capable of supporting yourself. Discover the concepts you will need to make this happen. Explore the role of fasteners with different materials using real tools. Examine a variety of natural and man-made materials and learn their properties. Build a framework and test it for strength and stability.



Young scientists develop critical thinking, problem-solving, teamwork, and other 21st century skills.

GRADE TWO

ANIMAL COVERINGS AND ADAPTATIONS

Life Systems

How does beaver fur feel compared to raccoon fur? What does a butterfly wing really look like? Why do porcupine quills work so well as a defense? Explore some of nature's most unusual coverings including feathers, shells, scales, quills and fur. Investigate the unique properties of a variety of animal coverings and discover some of the amazing adaptations animals have to survive their environment and seasonal changes.



LET IT FLOW: AIR AND WATER

Earth & Space Systems

Discover the properties of air and water and the need to protect these valuable resources. Learn that air has weight, takes up space and can be used to save an accident victim. Explore the water cycle while creating a special keepsake. Uncover the hidden power in a water wheel and race your own yacht to investigate the impact of sail size.

LOOKING AT LIQUIDS

Matter & Energy

Marvel as you explore the three states of matter, change a liquid to a solid and then eat it. Become a thermometer and investigate the conditions necessary to produce a change in state. Discover what an orange and a hockey puck have in common while exploring buoyancy and how to increase it. Explore how different states of matter interact while investigating solubility and take up the challenge to produce the world's biggest bubble.

MOVE IT!

Structures & Mechanisms

As masters of all that move, discover how simple machines make work easier. Motor along as you construct your own car while exploring wheels and axles. Go fishing to experiment with levers. Raise the flag using a pulley. Investigate wedges to discover what doorstops and airplanes have in common. Make your own screw and drive a car to learn about inclined planes.

NEVER SAY UGH TO A BUG

Combined Grade Content | For Grades 1 & 2

Develop a new appreciation of bugs as an entomologist. Examine a variety of living and preserved invertebrate specimens. Investigate bug behaviours and habitats and become an insect to find other members of your colony. Explore insect life cycles and learn how they differ from other invertebrates. Discover the benefit and beauty of bugs.

"Having Scientists in School present a workshop to my class is invaluable. They come with topic expertise and the equipment needed to run hands-on centres that allow the children to explore and learn. My students are always engaged and gain a much better understanding of the topic."

- Grade 2 Teacher, Kawartha Pine Ridge District School Board after *Move It!*

GRADE THREE

FORCE, OF COURSE!

Matter & Energy



Step into the physics lab to investigate friction, gravity, magnetic and electrostatic force. Use a catapult to measure the impact of force on a projectile, design a marble run, and experiment with both marbles and magnets to see if they can defy gravity. Engineer a crash to test the effectiveness of seat belts.

PLANTS DO AMAZING THINGS

Life Systems

Sow the seeds of discovery. Join this botanical adventure and explore how a plant breathes, grows and stores its food. Examine leaf characteristics, be amazed by plant adaptations and make your own recycled paper. Discover some of the extraordinary products made from plants.

SOIL: IT'S TOO IMPORTANT TO BE TREATED LIKE DIRT!

Earth & Space Systems

Become a pedologist and get down and dirty with a variety of soil types. Discover that soil is composed of earth materials and decaying organisms. Race water through different soil types to investigate their capacity for holding water. Explore which nutrient makes soil blush as you learn about plant growth. Burrow through soil as a plant root to explore texture. Investigate erosion, build a soil profile and learn about decomposers by making friends with some earthy creatures.

STRUCTURES: STABLE AND STRONG

Structures & Mechanisms

Build your knowledge of structural strength and stability as a junior engineer. Explore the difference between man-made and natural structures. Investigate how the strength of a material can be altered by its shape. Create structures and learn the impact of forces acting upon them. Take up the challenge to design, build and test a bridge.



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GRADE FOUR

DON'T TAKE ROCKS FOR GRANITE

Earth & Space Systems

Become a junior geologist and dig into the concepts of mineral formation, the rock cycle and fossilization. Examine igneous, sedimentary and metamorphic rocks and identify a mystery mineral. Mine some edible ore and make your own fossil to take home.

GEARING UP: FUN WITH PULLEYS AND GEARS

Structures & Mechanisms

Create a work of art using an internal gear system and investigate the types of gear systems used in our everyday lives. Design and build gear, pulley, and belt drive systems which change the direction, speed, and magnitude of an applied force. Discover how we control gear systems to ride a bike efficiently and solve the challenge of how to move something much bigger than yourself.

HABITATS AND COMMUNITIES

Life Systems

Discover the original 'world wide web' and learn about the interdependence of plants and animals within ecosystems. Become an ecologist and build a food web, witness the fall of an ecosystem and study the impact of natural and man-made alterations on the environment. Examine habitat specimens and explore their adaptations to aid in survival.

LIGHT UP YOUR LIFE

Matter & Energy

Join us on this optical adventure and discover natural and artificial sources of light. Light up some body parts in a hunt for translucent objects. Turn your classroom into a colourful disco while learning about the visible spectrum. Bounce and bend light to investigate reflection, refraction, and fiber optics. Demonstrate how light travels and have fun while exploring interesting optical devices.



GRADE FIVE

BODY WORKS

Life Systems

Join us on a journey around the human body to explore its complexities. Assemble a urinary system to filter simulated plasma, measure lung capacity, and discover how to build working lungs. Explore the movement of your own joints and compare them to models. Identify human bones using X-rays and use a stethoscope to measure your heart rate. Travel around the circulatory system to explore how the organs work together.

ENERGY: THE POWER TO CHANGE

Earth & Space Systems

Be inspired to embrace energy conservation. Discover where energy comes from, its different forms and how it can be transferred or transformed. Identify energy stored in household objects, investigate how to launch a ping pong ball into space and discover how the energy in your body can power wind-up toys. Explore how changing your light bulbs and adding insulation can save energy. Experiment with solar panels and use one to play a tune.

MAY THE FORCE BE WITH YOU

Structures & Mechanisms

Join our engineering team to learn how structures resist the forces acting upon them. Learn about internal and external forces and the many ways they affect structures. Use everyday objects to learn about design features, investigate centre of gravity and learn its importance in structural design. Take on the challenge of designing, building and testing a freestanding structure.

WHAT IN THE WORLD IS MATTER?

Matter & Energy

Explore solids, liquids, gases and changes in state as detectives seeking clues to the mysteries of matter. Discover the difference between physical and chemical changes by investigating whether all plastics are created equal. Participate in our amazing evaporation race and carry out some cool chemistry in a Ziploc bag. Determine the identity of the mystery compound using your chemical intuition, some crafty experimentation and clues gathered during this chemical adventure.



GRADE SIX

AIR AND FLIGHT

Structures & Mechanisms

Soar as you explore the science behind powered and non-powered flight. Discover the properties of air and the principles of flight by levitating a ping pong ball, working with “sticky” air, and controlling angle of attack to achieve liftoff. Build your own plane and manipulate flight control surfaces to accomplish banked turns and aileron rolls. Test your avionics expertise by competing in a design contest to achieve the fastest and most stable propeller.

CLASSY CRITTERS

Life Systems

Discover the ‘Tree of Life’ while working as a taxonomist. Create order from the vast diversity of living things using the Linnaean classification system. Examine the microscopic world of protists and monerans and match macroscopic specimens by uncovering similarities and differences. Compare important connections between species to understand why a classification system from 1735 still works today.

ELECTRICITY: GET CHARGED

Matter & Energy

Step into the physics lab and build a human battery. Explore the nature of electricity, its generation and use. See how static electricity makes objects move. Design and build circuits to learn how a house is wired. Test conductors, insulators and switches. Explore electromagnets, simple motors and use your own energy to power a generator.

GRADE SEVEN

CLOSE ENCOUNTERS OF A CHEMICAL KIND

Matter & Energy

Become a chemist and discover the differences between pure substances and mixtures. Create solubility fireworks and make your own lava lamp to observe particle movement. Design your own experiment and use cool chemistry tools to analyze the ingredients in vitamin C tablets. Explore how different factors affect solubility by competing in a classroom race to dissolve. Use dilution techniques to determine how to get your daily dose of vitamins and run a titration experiment to analyze the vitamin C in your juice box!

ENGINEERING CHALLENGES

Structures & Mechanisms

Discover the secrets of structural strength and stability. Design and build a functioning cantilever able to withstand a substantial load. Investigate how to fortify beam, truss, arch and suspension bridges. Join a class-wide challenge to build a truss bridge resistant to static and dynamic loads and internal forces using only newspaper and masking tape.

HOT STUFF

Earth & Space Systems

Join our Research and Development team at the ‘Scientists in School Toy Company’. Challenge yourself to discover the secret workings behind a candle-powered putt-putt boat. Analyze how conduction, convection and radiation work together to propel these boats. Investigate how the particle theory links energy and temperature and how energy transformations keep things moving.

GRADE EIGHT

CELL EXPLORERS: INVESTIGATING CELL STRUCTURE AND FUNCTION

Life Systems

Become a cell biologist and examine a variety of plant and animal cells using compound microscopes and a videoscope. Examine your own cheek cells and other human body cells to determine their structure. Make wet mounts of plant cells and compare their structure to animal cells. Get absorbed in the study of osmosis and, if the season permits, explore pond water samples for living organisms.

FLUID POWER

Matter & Energy

Let the ideas flow as you explore fluids and their application in mechanical systems. Use hydrometers to determine relative density, race liquids to investigate viscosity, and find a boat while exploring buoyancy. Move a load with dump trucks to compare hydraulic and pneumatic systems and analyze the compressibility of fluids. Explore the magnification of power achieved in our hydraulic hockey stick cranes.

GROUNDWATER INVESTIGATIONS

Earth & Space Systems

Investigate the impact of the environment on our water supply. Evaluate the suitability of different house sites for maintaining a potable water supply. Discover nature’s filtration system and how it can become contaminated with pollutants such as salt, petroleum products, and fertilizers. Build your own water filtration system and examine its effectiveness in removing contaminants.



2016-17 Kidz Lab Mascot Challenge - CALL FOR ENTRIES!

CREATE A BRAND NEW MASCOT TO REPRESENT SCIENTISTS IN SCHOOL™!

Hey kids, it's time to get creative! Our beloved mascot, Mr. Scientist, is retiring and we need a NEW Kidz Lab Challenge mascot to take his place! This new mascot may be featured on our website, social media, and other communications materials, and the winner will receive some fantastic prizes. Download the entry package at:

scientistsinschool.ca/kidz-lab.php



**SCIENTISTS
IN SCHOOL**

Scientists in School™ is a leading Canadian science charity dedicated to sparking children's interest in science, technology, engineering, math, and the environment through hands-on discovery. Our mission is to ignite scientific curiosity in children so that they question intelligently; learn through discovery; connect scientific knowledge to their world; are excited about science, technology, engineering and math; and have their interest in careers in those fields piqued.

WE'VE MOVED!

Scientists in School

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STEM EDUCATION THROUGH PARTNERSHIP

Scientists in School relies upon the generous support of partners to subsidize the cost of workshops for all schools. Thank you to all of our partners.

CATALYST LEVEL

Natural Sciences and Engineering Research Council | TD Friends of the Environment Foundation

INNOVATION LEVEL

Cameco | RBC Foundation

IMAGINATION LEVEL

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EXPLORATION LEVEL

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