

# SCIENTISTS IN SCHOOL™

## 2016-17 WORKSHOP CATALOGUE

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



**TORONTO, DURHAM AND YORK REGIONS**



Book online at [scientistsinschool.ca](http://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](http://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](mailto: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](http://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](http://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](http://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.

### BUZZ ABOUT BEES

Investigate the busy life of a bee and its role in the hive. Dance like a bee to show other bees where to find nectar. Explore metamorphosis to learn about its life cycle. Learn how to pollinate flowers. Discover which honey tastes the best. Use a microscope to examine pollen sacs and follow the honey from the hive to the store.

### 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.

### MAGNET MAGIC FOR LITTLE EXPLORERS

Uncover the power of attraction by investigating magnets. Explore how magnets like to push and pull. Discover what magnets find attractive and if magnetic forces can work through a variety of materials. Search for sandbox treasures, go fishing and catch a fish to take home.

### 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.

### YOUNG FRIENDS OF THE EARTH

Make every day Earth Day at your school. Investigate how the choices we make affect the Earth we share. Examine wiggly worms and help feed our feathered friends. Plant a seed and discover how you can help with water conservation. Explore how to reduce, reuse and recycle.



"I have booked dozens of Scientists in School workshops. They are consistently some of the best educational programming I have experienced in my 12 years of elementary teaching. The opportunities for hands-on exploration, coupled with the knowledge of the presenters, ensures that the students are always engaged and enthusiastic. I highly recommend Scientists in School to anyone looking for a great learning experience with science."

- Kindergarten Teacher, Toronto District School Board after *Backyard Bugs*

# 2016-17 SCIENTISTS IN SCHOOL™ CLASSROOM WORKSHOPS

Book your workshop today at [scientistsinschool.ca](http://scientistsinschool.ca) or by using the provided booking form

## 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.

### KITCHEN CHEMISTRY FOR CURIOUS KIDS

Special Interest | For Grades 1 & 2

As food scientists, savour the science behind baking bread. Find out why yeast makes bread rise and investigate the chemistry behind baked goods as you blow up a balloon without using air. Do 'The Molecule Dance' to learn about the three states of matter and how solids, liquids and gases move. Challenge your powers of observation by participating in our taste test.



### MICROSCOPY: MORE THAN MEETS THE EYE

Combined Grade Content | For Grades 1 - 3

Visit the world of the small and mighty. Use hand magnifiers and compound and stereo microscopes to discover a different point of view. Explore how hitchhiker seeds travel, identify insects by a closer examination of their wings and meet some of the weird and wonderful living creatures found in pond water.



### 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.

### SENSE AND SENSE-ABILITIES

Special Interest

Come and explore the power of your senses. Discover sound waves while exploring your sense of hearing with different sized animal ears. Test your sense of taste and use your sense of smell to investigate different environments. Try to "see" with your hands as you explore your sense of touch. Learn how light helps us see; compare animal, insect and human vision; and learn some simple phrases in sign language.

### 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.



# THE FIELD TRIP THAT COMES TO YOU!™

## 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.

### KITCHEN CHEMISTRY FOR CURIOUS KIDS

Special Interest | For Grades 1 & 2

As food scientists, savour the science behind baking bread. Find out why yeast makes bread rise and investigate the chemistry behind baked goods as you blow up a balloon without using air. Do 'The Molecule Dance' to learn about the three states of matter and how solids, liquids and gases move. Challenge your powers of observation by participating in our taste test.

### 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.

### MATH: IT COUNTS

Mathematics | For Grades 2 & 3

Manage a bank account and earn money while learning about place value, currency and Venn diagrams. Practice telling time on both digital and analogue clocks. Explore fractions while performing a classroom play. Try to trick your teacher as you reorganize yourselves by a mystery attribute. Become a banker, a storekeeper and a shopper as you add up your money, make change and calculate your spending power.

### MICROSCOPY: MORE THAN MEETS THE EYE

Combined Grade Content | For Grades 1 - 3

Visit the world of the small and mighty. Use hand magnifiers and compound and stereo microscopes to discover a different point of view. Explore how hitchhiker seeds travel, identify insects by a closer examination of their wings and meet some of the weird and wonderful living creatures found in pond water.

### 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.

### TOYS AND TECHNOLOGY: FUN WITH PHYSICS

Combined Grade Content | For Grades 2 & 3

Join Penny Penguin on an amazing adventure through Toyland. Explore simple machines and forces as you help Penny waddle safely down an inclined plane and use a lever to catapult across an oily river. You and Penny will discover how friction can help her climb a mountain and that a pulley can make work easier. Investigate centre of gravity so that Eddie the Eagle can once again balance on his beak.

# KIDZ LAB MASCOT CHALLENGE

2016-17



## 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](http://scientistsinschool.ca/kidz-lab.php)

# 2016-17 SCIENTISTS IN SCHOOL™ CLASSROOM WORKSHOPS

Book your workshop today at [scientistsinschool.ca](http://scientistsinschool.ca) or by using the provided booking form

## GRADE THREE

### BATTLES IN THE TROPICAL RAINFOREST

Combined Grade Content | For Grades 3 & 4

Join our research team and travel around the world to explore tropical rainforest habitats. Make a rubber ball while discovering the benefits of using renewable rainforest resources. Learn about special adaptations of rainforest plants by constructing a tree from the roots up. Build a rainforest food web, learn the impact of species extinction and examine unusual rainforest specimens.

### MICROSCOPY: MORE THAN MEETS THE EYE

Combined Grade Content | For Grades 1 - 3

Visit the world of the small and mighty. Use hand magnifiers and compound and stereo microscopes to discover a different point of view. Explore how hitchhiker seeds travel, identify insects by a closer examination of their wings and meet some of the weird and wonderful living creatures found in pond water.

### 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 to hold 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.

### 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.



### 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.

### MATH: IT COUNTS

Mathematics | For Grades 2 & 3

Manage a bank account and earn money while learning about place value, currency and Venn diagrams. Practice telling time on both digital and analogue clocks. Explore fractions while performing a classroom play. Try to trick your teacher as you reorganize yourselves by a mystery attribute. Become a banker, a storekeeper and a shopper as you add up your money, make change and calculate your spending power.

### 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.

### TOYS AND TECHNOLOGY: FUN WITH PHYSICS

Combined Grade Content | For Grades 2 & 3

Join Penny Penguin on an amazing adventure through Toyland. Explore simple machines and forces as you help Penny waddle safely down an inclined plane and use a lever to catapult across an oily river. You and Penny will discover how friction can help her climb a mountain and that a pulley can make work easier. Investigate centre of gravity so that Eddie the Eagle can once again balance on his beak.

## PARTNER WITH SCIENTISTS IN SCHOOL FOR PARENTS REACHING OUT

Encourage parental enthusiasm and involvement in STEM through a Parents Reaching Out grant (<http://www.edu.gov.on.ca/eng/parents/reaching.html>).

Scientists in School will create a fun, stimulating science and math night with hands-on learning for all family members. Parents will discover new things together with their children and be provided with ideas on incorporating science and math into everyday activities.

Scientists in School can also provide a take home package with activities, promotional posters, and other organizational tools.

For more information on PRO partnership, email

[eco@scientistsinschool.ca](mailto:eco@scientistsinschool.ca)



"Thank you to Scientists in School for introducing my students to the *Light Up Your Life* workshop. The students enjoyed the hands-on and informative experience. The expectations and requirements for the science experiments were well thought out, and the instructions were easy to follow. The nice thing about the workshop - besides the fantastic presenter, materials, and set up - was that the students and teachers were left with curriculum resources to refer to after the workshop. I look forward to having Scientists in School again, and I highly recommend this program."

- Grade 4 Teacher, Toronto Catholic District School Board



## GRADE FOUR

### ADVENTURES IN THE BONE ZONE

Special Interest | For Grades 4 - 6

Delve into the diet and digestion of an owl as you discover what they eat for breakfast. Join this ecological adventure and dissect an owl pellet, use magnifying glasses to sort and identify bones and assemble a rodent skeleton. Examine a variety of mammalian skulls to determine species and explore similarities and differences between herbivores and carnivores.

### FRACTIONS IN ACTION

Mathematics | For Grades 4 & 5

Puzzle through fraction problems and learn how to read and compare fractions. Challenge yourself with our fractions jeopardy game. Use manipulatives to explore mixed numbers and improper fractions. Apply your new skills to follow a recipe and drink the resulting concoction.

### 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.

### BATTLES IN THE TROPICAL RAINFOREST

Combined Grade Content | For Grades 3 & 4

Join our research team and travel around the world to explore tropical rainforest habitats. Make a rubber ball while discovering the benefits of using renewable rainforest resources. Learn about special adaptations of rainforest plants by constructing a tree from the roots up. Build a rainforest food web, learn the impact of species extinction and examine unusual rainforest specimens.



### 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.

### 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.

### SOUND IS MUSIC TO MY EARS

Matter & Energy

Discover the science of sound as musical maestros. Explore sound waves and learn how sound makes your desk hum. Play the bucket bass to explore factors affecting pitch and create a laughing chicken to investigate amplification. Discover how the human ear detects sounds, guess the decibel level of a jet engine, and learn how to protect your ears. Form your own classroom orchestra and serenade your school.

# 2016-17 SCIENTISTS IN SCHOOL™ CLASSROOM WORKSHOPS

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## GRADE FIVE

### ADVENTURES IN THE BONE ZONE

Special Interest | For Grades 4 - 6

Delve into the diet and digestion of an owl as you discover what they eat for breakfast. Join this ecological adventure and dissect an owl pellet, use magnifying glasses to sort and identify bones and assemble a rodent skeleton. Examine a variety of mammalian skulls to determine species and explore similarities and differences between herbivores and carnivores.

### 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.

### BRAINSTORM: JOURNEY TO THE CENTRE OF THE MIND

Special Interest | For Grades 5 - 8

Travel the information highway to uncover the properties and functions of the human brain. On this journey, discover which side of your brain is dominant, learn how neurons send messages and explore strategies that improve memory. Examine and categorize optical illusions and explore how the brain works together with the sensory organs to help us understand our world.

### CHARGE UP YOUR ENERGY

Combined Grade Content | For Grades 5 & 6

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 the nature of electrical energy and its use. See how static electricity makes objects move. Design and build circuits to learn how a house is wired, and test conductors, insulators and switches.

### CLUED IN TO FORENSIC SCIENCE

Special Interest | For Grades 5 & 6

Become a forensic scientist and investigate this classroom whodunit. Collect and examine clues found at the scene of the crime. Discover evidence and learn how to analyze fibre and soil samples. Run a chemical analysis on mysterious powders. Take your own fingerprints and compare them to prints left at the crime scene. Analyze a ransom note using chromatography to identify the ink used by the criminal. Will you identify the culprit?



### 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.

### FRACTIONS IN ACTION

Mathematics | For Grades 4 & 5

Puzzle through fraction problems and learn how to read and compare fractions. Challenge yourself with our fractions jeopardy game. Use manipulatives to explore mixed numbers and improper fractions. Apply your new skills to follow a recipe and drink the resulting concoction.

### MATH BUILDERS: MATH FROM THE GROUND UP

Mathematics | For Grades 5 & 6

Create a company, produce a commercial and win a lucrative building contract. Precise measurements and team participation will win you points. Learn to estimate, calculate area and perimeter and use decimals to select and cost flooring. Plan and build a structure with walls strong enough to withstand a disaster.

### 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 free-standing 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.



"This interactive experience was an incredible learning opportunity for my grade 5 students. Scientists in School proves that they not only know the content but also how to present it to children in a comprehensible, age-appropriate and engaging way."

- Grade 5 Teacher, York Region District School Board after  
*Energy: The Power to Change*

**Our workshops enrich and extend Ontario's STEM curricula. Young scientists develop critical thinking, problem-solving, teamwork, and other 21<sup>st</sup> century skills.**



## GRADE SIX

### ADVENTURES IN THE BONE ZONE

Special Interest | For Grades 4 - 6

Delve into the diet and digestion of an owl as you discover what they eat for breakfast. Join this ecological adventure and dissect an owl pellet, use magnifying glasses to sort and identify bones and assemble a rodent skeleton. Examine a variety of mammalian skulls to determine species and explore similarities and differences between herbivores and carnivores.

### 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.

### BRAINSTORM: JOURNEY TO THE CENTRE OF THE MIND

Special Interest | For Grades 5 - 8

Travel the information highway to uncover the properties and functions of the human brain. On this journey, discover which side of your brain is dominant, learn how neurons send messages and explore strategies that improve memory. Examine and categorize optical illusions and explore how the brain works together with the sensory organs to help us understand our world.

### CELESTIAL SLEUTHS

Earth & Space Systems

Come explore the nature of our solar system, its shape and the bodies within it. Move through the phases of the moon. Build a solar system to scale and puzzle your way to a celestial body. Explore human reaction times in space and lift a chair with your very own Canadarm End Effector.

### CHARGE UP YOUR ENERGY

Combined Grade Content | For Grades 5 & 6

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 the nature of electrical energy and its use. See how static electricity makes objects move. Design and build circuits to learn how a house is wired, and test conductors, insulators and switches.

### 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.

### CLUED IN TO FORENSIC SCIENCE

Special Interest | For Grades 5 & 6

Become a forensic scientist and investigate this classroom whodunit. Collect and examine clues found at the scene of the crime. Discover evidence and learn how to analyze fibre and soil samples. Run a chemical analysis on mysterious powders. Take your own fingerprints and compare them to prints left at the crime scene. Analyze a ransom note using chromatography to identify the ink used by the criminal. Will you identify the culprit?

### 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.

### MATH BUILDERS: MATH FROM THE GROUND UP

Mathematics | For Grades 5 & 6

Create a company, produce a commercial and win a lucrative building contract. Precise measurements and team participation will win you points. Learn to estimate, calculate area and perimeter and use decimals to select and cost flooring. Plan and build a structure with walls strong enough to withstand a disaster.



“Scientists in School is the one program we can honestly state the students truly enjoy, love, soar, and benefit from. Every student participates, feels successful, and valued. The program is set up in such a way that each student feels special, feels intelligent, and included. This program is a true recipe for success of the student. It is something we never hesitate to continue with.”

- Grade 7 Teacher, Durham District School Board

## GRADE SEVEN

### AND THE BAND PLAYED ON

Special Interest | For Grades 7 & 8

Join the classroom orchestra to compose and perform a unique piece of music on instruments you have designed and built. During this musical adventure, discover the fundamental concepts of sound and factors affecting frequency and amplitude. Examine good tone production, discover the rich history of musical instruments and explore music from around the world.

### 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.

### GLOBAL CLIMATE CHANGE

Special Interest | For Grades 7 & 8

Cultivate an interest in ecological stewardship by discovering the science behind global climate change. Explore its impact on our planet by charting the flow of energy through a biome. Shop in a classroom market to calculate how consumer choices affect the environment. Witness the earth heat up as it is exposed to greenhouse gases, explore the effect of carbon dioxide on the earth and examine man-made and natural disasters.

### BRAINSTORM: JOURNEY TO THE CENTRE OF THE MIND

Special Interest | For Grades 5 - 8

Travel the information highway to uncover the properties and functions of the human brain. On this journey, discover which side of your brain is dominant, learn how neurons send messages and explore strategies that improve memory. Examine and categorize optical illusions and explore how the brain works together with the sensory organs to help us understand our world.



### 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.

### 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!

### GENE: HOW DO YOU PASS IT ON?

Special Interest | For Grades 7 & 8

Work as a geneticist to learn how traits are passed from one generation to the next. Explore cell reproduction through mitosis and meiosis. Discover where your eye colour came from by delving into dominant and recessive genes. Learn the structure and function of DNA by making an edible model and extracting your own.

### MATH IS MY BUSINESS!

Mathematics | For Grades 7 & 8

Money is the name of this game. Become a neurologist, stock broker or rock star and watch the dollars pile up in your bank account. Play games in which you either earn or lose money while testing your basic math skills. Build a dream team for the hockey or basketball playoffs, calculate cap space and the probability of losing your players to injury. Will you earn your first million or break the bank?

# 2016-17 SCIENTISTS IN SCHOOL™ CLASSROOM WORKSHOPS

Book your workshop today at [scientistsinschool.ca](http://scientistsinschool.ca) or by using the provided booking form

## GRADE EIGHT

### AND THE BAND PLAYED ON

Special Interest | For Grades 7 & 8

Join the classroom orchestra to compose and perform a unique piece of music on instruments you have designed and built. During this musical adventure, discover the fundamental concepts of sound and factors affecting frequency and amplitude. Examine good tone production, discover the rich history of musical instruments and explore music from around the world.

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### 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.

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### 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.

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### SYSTEMS AT WORK

Structures & Mechanisms

Join our trolls on an exciting journey to Trollstock. Discover the mechanical advantage of a variety of simple machines brought along to overcome obstacles they encounter. Explore the use of wedges, pulleys, an inclined plane and levers to overcome hurdles with the help of a small pixie. Investigate the effect of friction, calculate the amount of work done and participate in a final challenge as you reach your destination.

"Scientists in School provides my students with an amazing hands-on experience that I may not have been able to provide due to lack of materials and equipment. The experiments are age-appropriate and engage students at all levels. What a fun way to learn the curriculum!"

- Grade 8 Teacher, Toronto District School Board





**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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