

# The Alberta Science Teacher



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URSA MAJOR

Telus World of Science Mobile Planetarium at Conference 2009



# From the Editor



**W**elcome to the new school year. If things haven't been crazy enough for you, I'm glad you are a superhero! On this end, I've been working on the newsletter, teaching a Biology 20 night class, sub-

bing during the day (which has been much busier than I thought it would be!), and working on the upcoming annual Science Council conference.

This year's conference, to be held November 20–21 at the Red Deer Lodge in Red Deer, is a must-attend event for teachers at any grade level. The sessions are evenly spread among K–12, and a few great sessions will focus on some newer technology for the higher-level sciences.

Our keynote speakers are unique, and anyone calling himself the Bad Astronomer (Dr Phil Plait) is sure to entertain! Maureen Parker, from the Battle River School Division, will provide us with insight into the upcoming elementary science program of studies, with the goal of helping teachers connect research and practice as they collect and make sense of the evidence of learning in their classrooms.

As shown on the cover, Edmonton's Telus World of Science will bring its mobile planetarium to the conference and will exhibit the dome the entire time. They will also be holding specific sessions for Grades 6 and 9, and a general session for those who are curious.

Did I mention the wine and cheese? Well, to give you a sneak peak, Cosmic Journey and Nelson Education will be hosting the Thursday-evening wine and cheese. Expect great wine and theme-fitting entertainment. Who doesn't want to sip a nice shiraz while checking out space? (No, not spacing out!) Keep reading the newsletter to learn more about Cosmic Journey.

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Visit [www.atasc.ab.ca/conference/](http://www.atasc.ab.ca/conference/) for more information and to register for the conference.

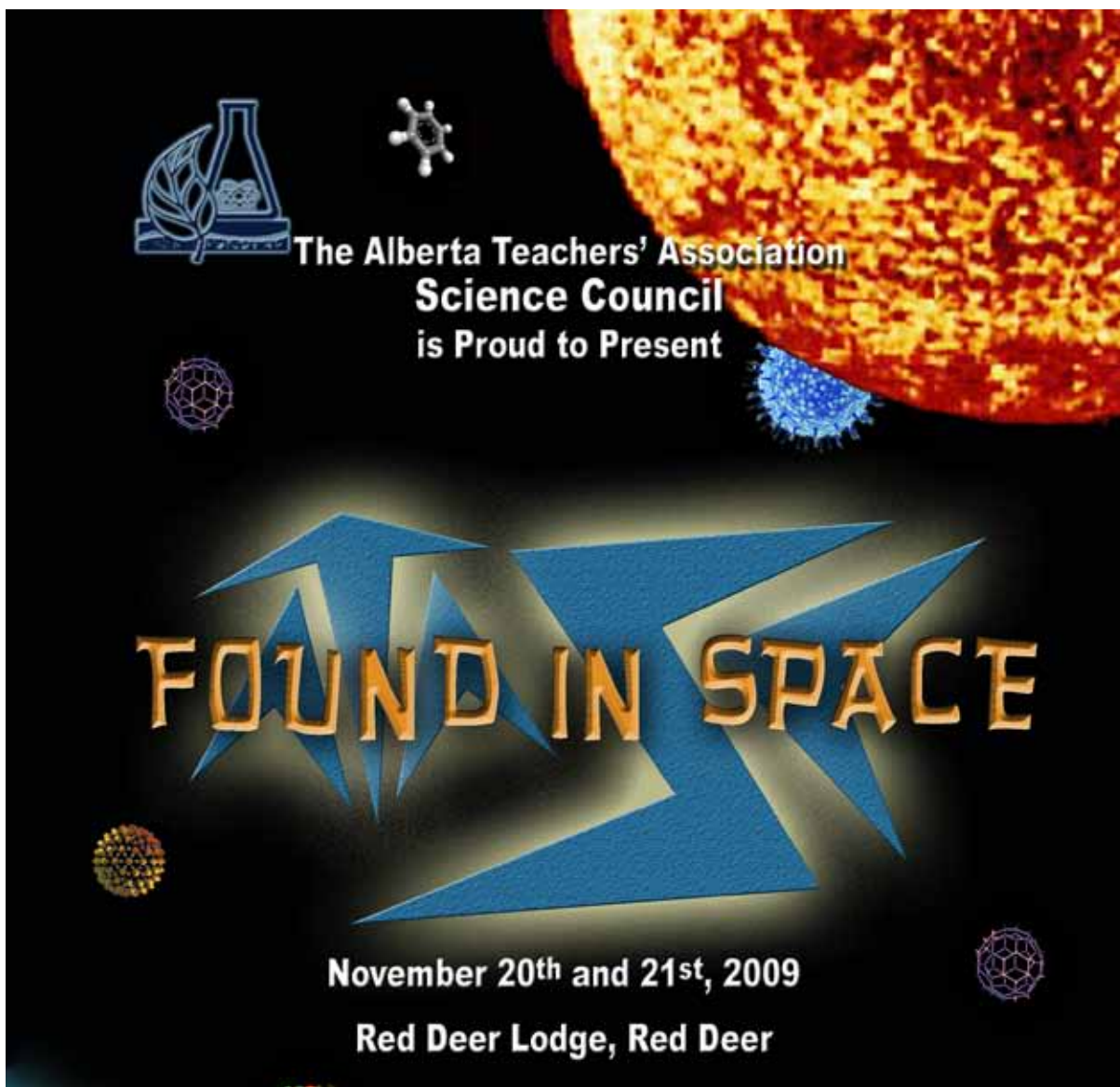
Also in this issue, find great classroom-ready resources from across the board, including the University of Alberta Museums Muse Project and a service-learning unit on conservation and snow leopards. Check out what's new in physics at the 40th annual Physics Teachers Conference and Workshop, to be held at the University of Alberta on December 4.

Think your students have what it takes to win? Check out the Awards and Competitions section.

Or head to the Women in Science section to read some award-winning student essays from the Operation Minerva contest.

I hope you enjoy this issue. It took a while to put it together, but I think it contains some great resources that all science teachers can use. If you beg to differ, send me some stuff! Or if you just want to let me know how I'm doing with *The Alberta Science Teacher*, feel free to e-mail me at [andilynn.bender@gmail.com](mailto:andilynn.bender@gmail.com).

Andi-Lynn Bender



# From the Council

## Science Council Awards

Every year the Science Council gives out two awards to people who have been nominated by their peers.

### Outstanding Science Teacher Award

The Outstanding Science Teacher Award recognizes excellence in science teaching in Alberta. Criteria include contributions to science teaching, such as articles, workshops, curriculum development and other instances of professional development. Strong consideration is given to outstanding classroom teaching over an extended period of time. Eligibility is limited to those currently teaching at least two-thirds of the time. An annual plaque and a personal “keeper” plaque are presented to the recipient at the annual conference banquet. Travel expenses to the conference, one night’s accommodation and meals for the recipient are covered by the council. The recipient will be asked to share his or her approach to science teaching, either by writing an article for a Science Council publication or by being interviewed by the editor (or a designate).

### Distinguished Service Citation

The Distinguished Service Citation recognizes a broad, extended contribution to science education in Alberta. The criteria include curriculum development, inservice, outstanding classroom teaching, professional publications and contributions to the greater community related to science education. The award consists of a large annual trophy and a personal “keeper” trophy presented

to the recipient at the annual conference banquet. Travel expenses to the conference, one night’s accommodation and meals for the recipient are covered by the council. An article describing the recipient’s contributions should appear in a Science Council publication.

To nominate a teacher for either of these awards, contact Colleen Yoshida (colleen.yoshida@gmail.com) or Ed Leong (ejleong@ucalgary.ca) by November 13.



## Council Positions Available

As the Science Council’s AGM approaches, some nominations have been made for the executive roles that are opening up:

- President-elect—Kevin Klemmer
- Treasurer—Karen Atkinson
- Physics director—Cliff Sosnowski
- Postsecondary representative—Ed Leong

Other positions will need to be filled, also. We are currently looking for teachers who would like to participate on the ATA Science Council executive, in the following positions:

- Secretary
- Chemistry director
- Biology director
- Division IV general science director

If you have ever wanted to be part of a large community of teachers who advocate for science education in our province, or know someone else who does, please contact Science Council president Erick Noriega (eenoriega@cbe.ab.ca) by November 13.

We will announce the new executive at our AGM, to be held during the annual conference in Red Deer, November 20–21.

# Classroom-Ready Resources

## Cosmic Journey: Bringing the Cosmos Down to Earth

Understanding astronomy and educating others can be complex. After all, astronomy can be involved in explaining everything from the extinction of the dinosaurs to where the calcium in our bones comes from. Earth is part of the cosmos, so everything on Earth is inherently connected to the cosmos.

Through education programs, Cosmic Journey works to explain the elements of the sky above us, the planet below our feet, and how both have had an effect on human civilization and the biosphere we live in. We see ourselves as tour guides to the cosmos. Our tagline “Welcome Aboard!” is a clue to how we deliver our sessions. We start our virtual trip from Earth and explain our way out into space, detailing the objects and regions that surround our planet within the known universe.

Cosmic Journey provides comprehensive programming, and each astronomy topic has something for every grade level from 4 to 12. Our core modules are designed for sky and space science curricula, but we can get into more detail in the higher grades. Everything can be further detailed for biology, chemistry and physics classes.

In our sessions, we enhance the curriculum and involve students in active participation. Taking into account the knowledge level of particular grades, we try to make our sessions interesting and engaging. Our core modules are

the constellations, the Moon and the planets, stars, deep sky objects, astronomical equipment and astrophotography. Before running a session, we work with the teacher in order to meet particular curriculum requirements and the teacher’s goals.

If requested, we can provide the opportunity to do some “field work,” by having students look through telescopes onto distant worlds—stars, stellar nurseries, remnants of past stars and galaxies.

There has also been a lot of interest in our constellation tours. We draw out the constellations in the night sky and talk about the stars they comprise, how they got their names and other interesting objects within them that may not be visible to the naked eye. We show how the constellations are the road map to finding objects in the night sky. Understanding their locations and seasonal changes is fundamental to navigating the cosmos. Although we can deliver this instruction in





the classroom, we also have the ability to showcase the sky on a clear night in the field—an entirely different and enhanced experience.

After delivering a session—whether in class, in the field or both—Cosmic Journey also provides support for additional class activities, such as research or writing reports. The Cosmic Journey website ([www.cosmicjourney.net](http://www.cosmicjourney.net)) includes blogs, links to other resources and a calendar of events, as well as our contact information.

Sustainability is a new topic we are looking at. Sustainability involves an understanding of our place and the Earth's place in the cosmos, the human impact on our biosphere and the potential management of it. The topic is becoming increasingly apparent in business activities and career opportunities. We are developing sessions on sustainability for the higher grades (because of the topic's overlap with other subjects at the high school level and because of its complexity).

Using light pollution as a case study to discuss the social, economic and environmental tiers of sustainability is a delivery method that can simplify understanding. Light pollution results from the inefficient use of artificial light, light that trespasses into the night sky and blots out the stars and the Milky Way. Cosmic Journey is actively engaged in light pollution abatement in the community. We are a board member of the Beaver Hills Initiative and are active in protecting the night sky within the region.

For more information or to book a Cosmic Journey, please visit [www.cosmicjourney.net](http://www.cosmicjourney.net).

## Telus World of Science Mobile Planetarium at Conference 2009

The Telus World of Science Mobile Planetarium is an out-of-this-world experience for your students!

We will bring the universe to you when you rent our Mobile Planetarium for a week. Have your students explore a wide variety of astronomy topics, including constellations, planets, deep space objects, cultural myths and nighttime navigation. The Mobile Planetarium can be used to supplement any astronomy unit. Each unit comes complete with everything you need to show the night sky and Greek constellations; North American Indian constellations and deep sky objects are available upon request. Instructions and activity manuals are included.

The Telus World of Science will host five presentations at the Science Council's annual conference (to be held November 20–21 in Red Deer), and the dome will be available for viewing at any time during the conference. Don't miss out on this unique and informative experience!

The Mobile Planetarium program is made possible in part through the generous support of Museums Alberta and the Royal Astronomical Society of Canada, Edmonton Centre.



# Biology 20 Resource: Humorous Article About Our Impact on the Hydrologic Cycle

Rachel Toews, the Science Council's biology director, has found an article that could be used with Biology 20 students in discussions about the human impact on the hydrologic cycle.

"Canada Takes Crap for Flushing Raw Sewage into the Ocean," by Larry West, opens as follows:

Canada flushes some 200 billion liters of raw sewage directly into natural waterways every year, from the St. Lawrence River to the Strait of Juan de Fuca and the Pacific Ocean. That's only a fraction of the three trillion liters of sewage Canadians produce annually—about 6 percent, in fact—but it's still enough to fill more than 40,000 Olympic-sized swimming pools.

Already intrigued? Just wait until People Opposed to Outfall Pollution (POOP) and Mr Floatie ("a cheerful, man-sized piece of human excrement") make an appearance!

To access the article, go to <http://environment.about.com/od/waterpollution/a/canadasewage.htm>.

# U of A Museums Muse Project

The University of Alberta Museum's Muse Project is back for 2009/10. This school year we will provide all four exciting curriculum-based programs, as well as a new program. We have been updating our programs to reflect changes to Alberta Education curriculum, and we will relaunch them in phases.

Programs starting November 16, 2009:

- Journey to Ancient Greece (Grade 6 social studies)
- World Beneath Our Feet (Grade 7 science)

Programs starting February 1, 2010:

- Alberta/Arctic: Artifacts of Trade and Contact (Grades 4 and 5 social studies)
- Discovering Diversity (Grade 9 science)

New program starting March 1, 2010:

- Edo Japan: From Isolation to Creative Explosion (Grade 8 social studies)

Journey to Ancient Greece will be available Tuesdays, Thursdays and Fridays. Other programs are available any weekday. The programs run for two and a half hours in the morning, starting between 9:00 and 9:30.

Bookings for all programs will begin September 30 by booking form only. To download the booking form, go to [www.museums.ualberta.ca](http://www.museums.ualberta.ca). All bookings are tentative until the booking confirmation is faxed or e-mailed to you. A registration form will be sent with your confirmation package. This form must be signed by your principal and returned with a class list before your visit. Please note that we allow a maximum of 30 students per group.

We look forward to welcoming you and your students to campus soon.

For more information, call 780-492-9700.

Stephanie Nemcsok  
Museum Education Program Coordinator  
University of Alberta Museums



# New SDWF Program: Operation Water Biology

Change is often driven by the needs of society, and few needs are as vital as safe drinking water. There are people all around the world who do not have access to safe drinking water, and Canada is not immune to this problem.

Over 1,700 communities in Canada are under boil-water advisories because many of them have water treatment facilities that are incapable of producing potable water from the available raw water source. These conventional water treatment facilities are being built in places with such low-quality raw water that there is no hope of adequately treating it. This continues because the water is not tested for ammonia, the contaminant that most disrupts the disinfection process. When ammonia is present in water, it will react with any chlorine that is added and will use it up before it has a chance to disinfect the water. This results in drinking water that has not been properly disinfected and, therefore, is not safe to drink. Health Canada has never applied a guideline for ammonia, despite the problems ammonia causes and despite the fact that many other countries and the European Union have ammonia guidelines in place.

Most Canadians are not aware of this issue, but the people in those 1,700 communities have to deal with it every day. Change in drinking water standards and treatment processes has been far too long in coming. This change will have to begin with education. By educating the next generation about such problems and alternative solutions, we can ensure that someday everyone will have access to safe drinking water.

Operation Water Biology (OWB), the newest in a line of school programs from the Safe Drinking



Water Foundation (SDWF), presents a new idea in the field of drinking water treatment. Through a series of hands-on experiments, students will learn about the chlorination process and how it is disrupted by ammonia, and about new biological filtering processes that are capable of producing potable water in places where other treatment facilities have failed. This technology will be put into the hands of students as they use a scaled-down version to filter water samples in the classroom.

The SDWF continues to offer its other programs: Operation Water Drop (OWD), Operation Water Pollution (OWP), Operation Water Spirit (OWS), Operation Water Health (OWH) and Operation Water Flow (OWF). Sponsored OWD and OWP kits are available through funding from the TD Friends of the Environment Foundation, Green Street and other organizations. For more information and to find out if a sponsored kit is available for your school, please contact the SDWF's program coordinator, Nicole Biederbeck, by phone at 306-934-0389 or by e-mail at [info@safewater.org](mailto:info@safewater.org).

Steven Elton  
SDWF Summer Student

# Conservation and Snow Leopards: A Service-Learning Unit from Facing the Future

Facing the Future, in collaboration with the Snow Leopard Trust, has just released “Engaging Students in Conservation: Protecting the Endangered Snow Leopard,” an interdisciplinary one- to two-week unit that includes five dynamic lessons and culminates in a service-learning project. The unit is designed for Grades 5–8 students in science and social studies. Though the lessons make up a comprehensive unit, each lesson can stand alone.

The unit includes the following:

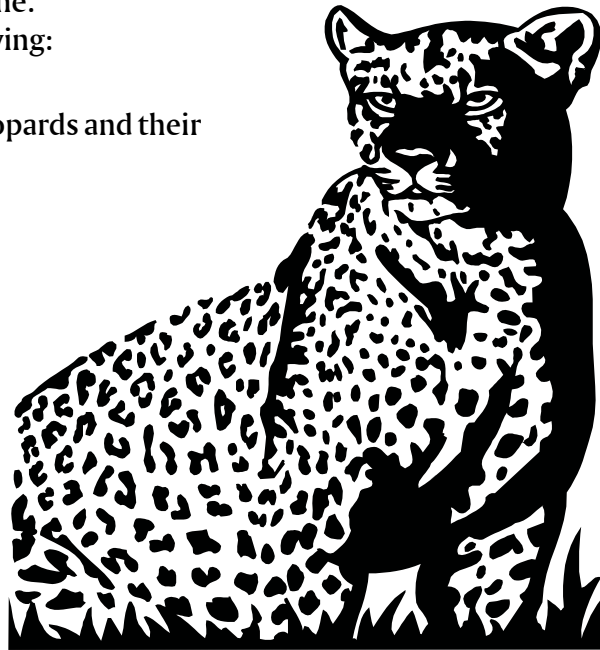
- Five hands-on lessons
- An introduction to snow leopards and their ecosystem

- An exploration of the human–wildlife conflicts that exist where people and snow leopards overlap
- Opportunities to develop 21st-century skills such as critical thinking, collaboration and adopting a global perspective
- An examination of community-based conservation
- A service-learning project related to the protection of snow leopards in Mongolia and Kyrgyzstan

These lessons were developed and piloted by teachers and conservation experts, including the Snow Leopard Trust, the world’s leading authority on the study and protection of the endangered snow leopard.

This unit, valued at \$14.95, is available for free download at [www.facingthefuture.org](http://www.facingthefuture.org).

**Kim Rakow Bernier**  
Outreach Director  
Facing the Future



# Professional Development

## 40th Annual Physics Teachers Conference and Workshop

The 40th Annual Physics Teachers Conference and Workshop will be held Friday, December 4, 9:00 AM–4:15 PM, at the University of Alberta. It will feature talks on the following topics:

- Testing the standard model in modern physics
- Sunspots—Galileo’s discovery and the implications for aurora and climate
- Perimeter Institute’s Explorations series workshop on quantum physics, “The Challenge of Quantum Reality” (all participants will receive a copy of this excellent resource, which includes a DVD, background information, student activities and worksheets for Physics 30)

Workshops will include the following:

- A guided tour of the medical and diagnostic physics facilities at the University of Alberta Hospital
- Using videotaping to create and analyze real data in the classroom and the laboratory (participants will receive a locally developed CD with classroom laboratory footage, background materials and data-collection handouts)
- PASCO scientific laboratory workshop

The cost of the conference is \$50 (part of which may be refunded if funding support is found). An elaborate buffet lunch at the university’s Faculty Club is included.

To register, e-mail [terry@phys.ualberta.ca](mailto:terry@phys.ualberta.ca).

For more information, e-mail [wytze.brouwer@ualberta.ca](mailto:wytze.brouwer@ualberta.ca).

Wytze Brouwer

## Inside Education’s Energy and Climate EcoLab at Conference 2009

As part of the 2009 Science Council conference, Inside Education will offer its Energy and Climate EcoLab, November 18 and 19 in Red Deer.

Alberta and its energy economy produce a significant amount of Canada’s greenhouse gases. The Energy and Climate EcoLab will help you understand the challenges and opportunities Albertans face in reducing these gases. You will

- learn about Alberta’s energy and climate change strategies and the actions that are contributing to a reduction in our emissions;
- examine opportunities to reduce the environmental footprint of energy development and change energy-consumption behaviour among industry and consumers;
- talk to a variety of individuals, groups and organizations whose initiatives have an impact on the management of Alberta’s energy sources; and
- take away lesson ideas and teaching resources to help connect your experience to the classroom.

You will also take a tour of Penn West’s Pembina Cardium CO<sub>2</sub> EOR site near Joffre to see first-hand what carbon capture and storage is all about.

The program begins the evening of November 18 at 7:30.

Apply by October 22 at [www.insideeducation.ca/prodev/terms.html](http://www.insideeducation.ca/prodev/terms.html). Applicants must also be registered for the Science Council conference.

# Women in Science

## Operation Minerva 2009 Essay Contest Winners

*The following are the winning essays in the Alberta Women's Science Network (AWSN) 2009 Operation Minerva student essay contest.*

### First Place

#### My Day with Operation Minerva at Canadian Pacific Railway

I have always joked with my friends and family that I wanted to be a train driver; so when I was chosen to visit Canadian Pacific Railway with Operation Minerva, I was ecstatic. Many things stood out to me about the company and its values throughout my time there, and I learned so much I would never learn elsewhere.

As we explored the yard and the offices of CPR, I was struck by the way that the company was concerned with their employees' safety. Throughout the whole experience, we were given safety briefings and established action plans if any unexpected accidents occurred. The workers had a high knowledge of safety hazards and dangers that could occur on a job site and had a keen sense for knowing how to avoid dangerous problems. I've thought of the many careers I could do and have considered a career in construction or mechanics, but it would be important to me to work at a company that had similar safety standards as those of CP Rail.

The company staff also instructed us on how we could contribute to the safety of this railway. They gave us helpful advice on how trains worked

and the dangers of them. We were instructed on the dangers of railway tracks and locomotives. One important lesson I learned is how long it takes for a train to stop. As hard as the driver might try to stop, the train will not come to a full stop for up to two kilometres.

Throughout the whole experience, I was aware of how encouraging the volunteers and staff at CP Rail were. I was full of questions through the whole experience and asked many questions. I was always given a smile and a detailed but simple answer when I asked a question. I could tell that everyone involved cared about my learning experience and they were more than happy to give me information. I'm sure all the adults were dedicated to their jobs and would love to tell anyone who asked about them. I remember once, when we entered a room where people were communicating with the trains, I was unsure of all the things that were happening, but the woman who was telling us about it really simplified it to our level so we were all able to understand.

Sometimes I have trouble seeing how some of the things we learn in school can help us once we are in our careers. However, at my time at Canadian Pacific Railway, I noticed many things that we learned in school were coming into play. Many of the employees were using concepts we have explored in math and in science. I could see the many ways different topics we were covering could be applied in a career. The experience really opened my eyes to the importance of our learning, even at a young age like mine. I have always been very interested in math and science, and to see adults using many concepts I could understand really encouraged me to pursue my studies.

While we were visiting the company, we had a session where we explored the ways in which Canadian Pacific Railway was making efforts to help our ecosystems and help preserve our

culture. We discussed the research and programs the company was using to help it make its trains and tracks more energy-saving and environmentally friendly. I noticed that the company had a great concern for the animals and people that inhabited the area around their tracks. CPR had made a great effort to protect and preserve the habitats of the animals and the culture of the people by conducting digs and experiments to test the quality of the soil and the cultural value of the land. I really appreciated the effort Canadian Pacific Railway went to in ensuring the protection of our culture, environment and ecosystems.

In conclusion, I learned so much from this trip I would never learn anywhere else, and I am grateful for all the volunteers of Operation Minerva. This trip was definitely a trip of a lifetime, and I will forever appreciate the time and effort everyone involved put into it. I will always remember the patience and respect the employees at CP Rail showed me and the help and flexibility of the volunteers of Operation Minerva. I will always recall the educational and fun activities we participated in during our time at CPR. I hope to be able to use my new knowledge of the railroad in the future, as it is very interesting to me.

Sarah Welsh

## Second Place

### My Operation Minerva Experience

The first time I heard about Operation Minerva was in my science class, when my teacher asked if any girls would be interested in job-shadowing women in the sciences. Right away my interest was sparked and I signed up. A few days later my teacher drew four names and mine was one of them. My heart leaped with joy as I realized I would be participating in a once-in-a-lifetime experience that could change my future.

On May 7, 2009, I stepped out of the cold and onto a yellow school bus that would take me to the WorleyParsons company. As the minutes ticked on and the kilometres to my destination

shortened, my excitement grew and grew. My mind was ablaze with a jumble of thoughts, and I could barely wait to meet my mentors. As the bus came to a stop, I promptly got up and followed my teacher volunteer into the building, where I first met one of my mentors, Larissa David. She led me and the other nine girls up to her office area and filed us into the conference room, where we met the other seven mentors, who were patiently waiting.

After we had all introduced ourselves, we began to learn a bit more about WorleyParsons. We learned that it was an environmental consulting company, and that they worked to solve and prevent environmental problems. We then briefly looked at what happens when a problem is discovered and what measures would be taken to fix it. Larissa then set up an example of a contamination site for us to look at through the day so we could better understand their work.

We then began by learning about the first phase of the investigation, with Sheri Bouchard. She told us during this phase it was like being a detective, because they would go in and look for clues to see if the site was a problem or not. Geophysics was then brought up with Kim Hume, and we learned about how this helps in telling if there is any pollution and how it's spreading. Following this, Sheri came back and talked about soil delineation, and we took part in a fun experiment, where we got to work hands-on with different types of dirt. We then cleaned up our messes and began learning about groundwater monitoring with Stephanie Loster. We were taught about how pollutants from problem sites spread through underground water systems and wells, and how they look to treat the water and stop the problem from spreading. Stephanie had a great visual model to show us how the contamination moves through different types of porous soil and into ground wells. We also got to work by looking at different pH levels of various drinks that were brought into our lunch.

For lunch we had amazing pizza and got a chance to talk among each other and see how our

experiences were going. Once we had eaten and were ready to go, Elizabeth Haack brought us into a presentation about risk assessment. In this presentation we learned about how at this point in their investigation, they examine if the contaminant is able to be left in the ground or needs to be removed. Then Andrea Borkenhagen came in and talked to us about how they deal with vegetation during their examinations and how they protect rare plants in the area. Following her, Erica Sorensen talked to us about dealing with wildlife and keeping them protected.

We then took a break from the presentation and got to work with Kim, Erica and Andrea. Kim took us outside and showed us how the EM (electromagnetic) machine worked. We walked along a laneway and discovered how the instrument picks up any metal present in the ground. Erica taught us different types of animal calls and, finally, with Andrea we looked at different plants and how to identify them using field guides. Once our break was over, we looked at remediation with Larissa, which is the final step in cleaning up environmental problems. Remediation is the removal and cleanup of the harmful chemicals, and restoring the land back to its original state. When all the presentations were over, we sadly said our goodbyes and took our last pictures, as we rushed to get back to the bus.

It was sad to leave WorleyParsons, but not entirely. For I left that building holding one of the most amazing experiences in my heart and mind. This opportunity has opened my eyes to so many more possibilities that I can follow in my future, and it has left me thinking about what I truly want to do with my life. I would like to thank all the mentors and volunteers who put in so many hours to make this happen, because it was a wonderful experience that I will take with me for the rest of my life, and I am so happy and excited for future Grade 8 girls to experience it, too.

**Victoria Hill**  
**Our Lady of Peace School, Calgary**

## **Third Place**

### **My Operation Minerva Experience**

My name is Samantha D'Amico. I am a Grade 8 student at Dr Gladys McKelvie Egbert School. When my science teacher came to me and asked me if I would like to participate in Operation Minerva, I was thrilled to find out that I had been chosen.

When I found out I was going to Canadian Pacific Railway (CPR), I was really excited because I like trains and wanted to know more about them.

My main contact and mentor was Diane Forbes, a business analyst for CPR. Other mentors and trainers were Aleshia Perry, process engineer; Michael Roney, general manager and chief engineer; Brandi Spiers-Rogers, market analyst; and Jennifer Findlay, business analyst.

When we went to Canadian Pacific Railway, we did many things, such as go to their training centre, learn about what they do for the environment, and how they control and communicate with the trains.

First we were taken to the training facility. When we got there, we went over the safety precautions and rules of the facility. Soon after that we split into smaller groups and went to three different activities. The activities were signals and communication, electrical, and the train simulators. My favourite activity was the simulators.

The first activity that I went to was communications and signals. A couple of the important things that they do here is they switch the tracks when needed and locate all of the train cars in Canada or the US. They do this through radio traffic control (RTC). RTC controls the tracks and their movements through a wireless signal.

The second activity I went to was to learn about the locomotives. A locomotive is the engine at the front of the train that pulls all of the cars behind it. Some of the larger trains will have another locomotive at the end, pushing the train. The locomotive is run by a diesel engine. The diesel engine turns the main generator, which generates electricity to power the traction motors, which turn the wheels on the locomotive.



The last activity we did at the training facility was to try out the two locomotive simulators. The first one that I went on was the newer-style locomotive. It has the same environment and controls as the real thing. They teach you how to use the brakes, bell, whistle and everything else you would need to know if you were driving a real train. The second simulator was an older-style locomotive. Most of the controls were different, but they still had the same purpose. Both of the simulators were fun and educational.

They emphasized to us in every class and activity that you should never be listening to your music and not paying attention when near the train tracks. This is because it takes at least two kilometres for a train to stop, and that is only if someone on the train sees you.

After we left the training centre, we went back to Gulf Canada Square. When we were there, we learned different facts and information about Canadian Pacific Railway and how it is structured and operates.

Some other facts that I learned and found very interesting were that Canadian Pacific Railway is the biggest and most popular train company in Canada. CPR works with other railway companies to enlarge their area of access, similar to the airlines. Also, their tracks run through six provinces and thirteen states. Every day there are 750 trains running on their tracks. In fact, most of the goods in your house were probably once transported by train.

Some people at CPR even work through Christmas, as this is a busy time for them. This company seems like an easy place to work, but actually it is harder than it seems because of all the safety precautions that they have to take and long hours.

Later, still at Gulf Canada Square, we learned how they control all of the trains and the traffic on the tracks. RTC controls all of the trains and makes sure that they don't run into each other. The higher-priority trains get to pass the lower-priority trains and go on their way. If two trains are heading toward each other, the lower-priority

train will be pulled off to the side and brought back after the other train has left. Any train on Canadian Pacific Railway's tracks can be seen on their computer screens at any time. The main RTC is located in Calgary.

From there we went on to learn about how CPR protects the environment. One of the biggest changes that CPR went through was changing all of the engines from steam power to diesel power. After making this change, the greenhouse gases in Canada from trains were reduced to 3.2 per cent. Over 45 per cent of greenhouse gases come from vehicles on the road.

Also, they always consider the three Rs when building new trains. They will reuse and recycle metal from old trains that are no longer in use. This reduces the amount of new metal required. Whenever they need to build new tracks, they will research on how it will affect the environment and will try to work around and protect the animal habitats.

Even when they are cleaning the trains, they consider the environment by using environmentally friendly soap and using as little water as possible.

In conclusion, there is much more to working at Canadian Pacific Railway than one would think. They need to consider safety in whatever job they are doing as this can be a dangerous job. They have to be very aware of how what they do will impact the environment. The staff are always working as a team and seem to enjoy their jobs.

It is amazing to see what the people in Canadian Pacific Railway do to transport everyday items from one place to another so the rest of us can go to the local store and purchase them. I had an excellent day with all the mentors and trainers at CPR and learned lots.

Thank you so much for choosing me for this opportunity. I think that it is great that girls like me are able to see and experience what people do in these jobs, and it gives me a lot to think about when considering my future career.

Samantha J D'Amico  
Dr Gladys McKelvie Egbert School, Calgary

# Operation Minerva at Nexen: Job-Shadowing for Aboriginal Girls

Oil and gas companies like Nexen depend on experts in earth sciences such as geology and geophysics. But these subjects, like other sciences, don't attract a lot of women.

Operation Minerva aims to change that by giving junior high girls a first-hand look at female scientists in action at companies across Alberta.

On June 5, five Aboriginal girls in Grades 8 and 9 visited Nexen to learn about rocks, pressure and physics as they relate to the oil and gas industry. This is the first time Operation Minerva has focused exclusively on Aboriginal girls. The students were from Ecole St Martha School's Aboriginal education program (Calgary Catholic School District) and Tsuu T'ina Junior High School (Tsuu T'ina Board of Education).

"We showed them the core labs, took them to the bridge, and they listened to a couple of presentations," explained Brittane Laverdure, a Nexen summer student working in Administrative Services who helped organize the event. "Operation Minerva focuses on sciences, so at Nexen that means geology and geophysics."

Geophysicist Becky Cook and geology summer student Thalia Aspeslet spent the day with the students, explaining how these sciences fit into an oil and gas company and describing their importance.

"We went over basic geology," says Becky, "because a lot of students aren't familiar with the principles. We talked about the Western Sedimentary Basin and explained how geology relates to oil and gas formation. I was surprised at how well they listened. The girls were really receptive."

"It's inspiring, confusing and interesting all at once," says Shelby Crowchild, one of the students who attended.

Operation Minerva was created in 1988 to bring young women and female science mentors together and to encourage a greater interest in science as a career. Annual Operation Minerva job-shadowing events have been organized in Calgary, Medicine Hat and Red Deer for 18 years. The first Lethbridge event took place at the University of Lethbridge this April. This year was also the first time an Operation Minerva job-shadowing event for Aboriginal girls was organized at the University of Lethbridge.



## Elizabeth Cannon Finalist for ASTech Award

Elizabeth Cannon, dean of the Schulich School of Engineering, University of Calgary, is the sole finalist in the category of Outstanding Contribution to the Alberta Science and Technology Community. ASTech has honoured her for being a champion of women in the scientific and engineering community, and for working to create an environment that encourages young women to successfully pursue an engineering education.



Joyce Luethy  
Executive Director  
Alberta Women's Science Network

# Awards and Competitions

VERNA J. KIRKNESS

“Be a **Food  
Researcher**  
for a Week”

PROGRAM



AN ABORIGINAL (MÉTIS, FIRST  
NATIONS AND INUIT) YOUTH  
IN SCIENCE INITIATIVE

Are you an Aboriginal Canadian high school student in grade 11 or 12 who wonders what it would be like to do cutting-edge food and nutrition research? If so, do we have an opportunity for you!

Aboriginal students from across Canada are invited to apply for the **Verna J. Kirkness Food Researcher for a Week** Initiative. This March 2010 program places high school students in the food and nutrition research labs of some of Canada's Top Scientists!

#### WHY SHOULD YOU APPLY?

#### FOR A CHANCE TO LEARN ABOUT SOME PRETTY COOL STUFF!

Have you ever wondered how your own genetic makeup affects what you like to eat? How simple nutrients can help fight diseases like Diabetes and heart disease? How Canadians are helping to increase the food supply? How you can shape what new food products companies bring to your grocery shelf? These are all questions that our researchers are answering & now you can find out how!

#### THIS IS A TRULY UNIQUE EXPERIENCE!

Students will be chosen from across Canada to spend a week in March in a Canadian research lab. With 2-4 students per lab, you will have someone your own age on this adventure with you! You will also share the knowledge of your mentor – a graduate student within the lab. You will work side-by-side with your fellow participant, your mentor, other graduate students and researchers, attending lab meetings and carrying out experiments.

You will truly become a member of the team, learning techniques and experiencing the inner workings of a university research lab!

#### WE COVER YOUR EXPENSES!

Successful applicants will have their meals, accommodations and travel expenses covered.

For more information or to apply, visit [www.afmnet.ca](http://www.afmnet.ca) and follow the homepage link. If you have any questions, please call **Louise** at (519) 822-6253 or email [louise.jessup@afmnet.ca](mailto:louise.jessup@afmnet.ca).

Canada

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Inspiration from the ground up

DEADLINE FOR APPLICATIONS IS DECEMBER 4<sup>TH</sup>, 2009

# Second Annual Where Challenge

After receiving rave reviews from hundreds of participating Canadian teachers and students, the Where Challenge is back for a second year.

The Where Challenge, a national contest endorsed by the Canadian earth sciences community and sponsored by EnCana, asks students aged 10–14 years to discover the answers to these questions: What on Earth is in your stuff, and where on Earth does it come from? The challenge was launched in September and runs until March 1, 2010. Almost \$17,000 in regional and national prizes will be awarded. Students are encouraged to use their imaginations in their responses and create an educational story about the nonrenewable earth resources found in an everyday item. (Nonrenewable earth resources are substances that occur naturally within the earth and must be mined, quarried or pumped out from underground. These resources are found in limited quantities and are consumed more quickly than natural processes can replace them.)

Teachers and students who took part in last year's Where Challenge gave it enthusiastic reviews, with almost all of them saying they would definitely take part again. Participating teachers say that the challenge offered them a unique method of presenting earth sciences material to students.

"You know a project is a success if at the Grade 7 level students are willing to do work on it

at home and really want to, rather than it being assigned as homework," says Crystal Pearl-Hodgins, who teaches at École Whitehorse Elementary School, in Whitehorse.

"The use of technology as a medium to demonstrate learning and allowing for creativity really tapped into something special for my students," says Amanda Tetrault, a teacher at River Heights Middle School, in Winnipeg. "Now that we have had a great experience participating in the Where Challenge, I will be able to incorporate this competition into my entire class as it ties in nicely with the Grade 7 science unit 'The Earth's Crust'."

"I found it to be a unique and exciting opportunity that allowed students to really contemplate how Earth's resources are used and how we often take the process for granted," says Kurt Smith, a teacher at Vincent Massey Junior High School, in Calgary.

"My students thoroughly enjoyed the challenge of researching different countries and the sources that come from the earth," says Susana Chan, a teacher at Montgomery School, in Saskatoon. "They were allowed to let their creative juices flow by making a rap or a video. They love using technology (multimedia resources) to enhance their projects either through a PowerPoint or editing their video."

As for students, many say that the Where Challenge helped them understand the importance of earth sciences and that they learned a lot just from viewing other entries on the contest website. The cash prizes for both schools and participants were also an incentive.

"I was really excited when I found out I won," says 13-year-old Shirley May, who, along with Nick Riopel, took home the Alberta regional



**WHAT on Earth is in your stuff?**  
**WHERE on Earth does it come from?**

prize, as well as the second national grand prize and more than \$2,000. “I started screaming and jumping up and down.”

“It was really fun to work on the project and look at the other entries on YouTube,” said Blake Nicol, after learning he’d won more than \$3,000 by snagging both the regional prize for BC and the first national grand prize.

Dozens of school classrooms and more than 1,000 students participated in the first annual Where Challenge. Contest organizers hope that this year’s challenge builds on that momentum to continue to raise awareness about the impor-

tance of nonrenewable earth resources and encourage young people to consider a career in earth sciences.

“The health of our sector depends upon young people entering the industry,” says John Boyd, Canadian chair of the International Year of Planet Earth (2007–09). “We’re hoping this challenge helps create the next generation of geologists and geophysicists.”

For more details, please visit [www.earthsciencescanada.com/where/](http://www.earthsciencescanada.com/where/), or contact Jennifer Lyall at 403-818-8984 or [lyalljennifer@shaw.ca](mailto:lyalljennifer@shaw.ca).



# Gene Researcher for a Week Program

The Canadian Gene Cure Foundation is pleased to announce that from November 15, 2009, to January 8, 2010, applications will be accepted for the 2010 Gene Researcher for a Week (GFAW) program.

The program is intended for motivated students in Grades 11 and 12 who have an innate curiosity about science, human genetics and human genetics research. This year we will accept up to 30 students into the program.

The program offers the following to high school students:

- *The opportunity for a hands-on learning experience in the field of genetic research.* Students gain insight into the world of genetic diseases by conducting real hands-on scientific experiments (such as DNA isolation, PCR, gel electrophoresis, SDS-PAGE, Western blotting, cell culture and ELISA assays). Participants may also learn how genes cause human genetic disorders, and how top scientists translate these findings into treatments and cures for genetic diseases.
- *The opportunity to work in one of Canada's top genetic research laboratories.* Students are placed in the labs of influential Canadian scientists for one week over spring break. This gives young students what many have called a life-changing experience. The GFAW mentoring program is a great opportunity for young scientists to learn about human genetics research and connect with some of Canada's best researchers.
- *The opportunity to develop a network of high-potential peers.* Student gene researchers are bright, talented and highly motivated. By participating in the program, they will have an opportunity to meet people in their host lab and institution. Some labs will host more than

one student, providing a further opportunity to network with other students.

- *The unique opportunity to learn about the many exciting career paths in science and genetics.*

Please encourage your motivated students to apply for this one-of-a-kind opportunity. The application form will be posted at [www.genecure.ca](http://www.genecure.ca) on November 15.

More information is available on the website, or you may contact us directly at [info@genecure.ca](mailto:info@genecure.ca) or 250-213-8056.

## Selection Criteria

Students will be placed with their host scientists during spring break. Because of the high number of applications, candidates will be selected based on the following criteria:

- Must be a resident of Canada
- Must be a high school student in Grade 11 or 12
- Must have a high academic standing (overall GPA of 85 per cent or higher)
- Must show interest in pursuing a career or education in human genetics
- Must be well rounded (academic, volunteer and extracurricular activities)
- Must complete an application form and submit all required documentation by the deadline (January 8, 2010)

## Cost to Students

There is no cost to apply for or participate in the program. However, if accepted and placed in a lab away from home, students are responsible for all travel and food costs. The Canadian Gene Cure Foundation will pay for accommodations only.

Gene Researcher for a Week is supported by the Canadian Institutes of Health Research (CIHR) Institute of Genetics and by the Natural Sciences and Engineering Research Council of Canada (NSERC).

Tracy Zeisberger  
Foundation Manager  
Canadian Gene Cure Foundation





Tell Us About Canada's Top Biotechnology Story of the Year

In conjunction with **National Biotechnology Week**,  
**Gowling Lafleur Henderson LLP** invites you to participate in our  
**BIOTECH ESSAY CONTEST**

Write and submit a 1,500 word essay by May 30, 2010 on your view of "Canada's Top Biotechnology Story of the Year."\* Winners must be entering a life sciences-related field at a Canadian post-secondary institution to be eligible. Essays will be judged by a panel of industry experts and first, second and third place winners will be recognized.

The **first place winner** receives:

1. First year tuition to a maximum of \$5,000 to a Canadian post-secondary institution if the entrant is entering a life sciences-related field.
2. An excerpt of their essay published in the fall issue of BIOTECCanada's *Insights* Magazine and the full essay posted online.
3. Recognition during National Biotechnology Week as the contest winner.

The **second place winner** receives a laptop.\*\*

The **third place winner** receives an iPod Touch.\*\*\*

To enter, send an original essay including your name, address, phone, e-mail, date of birth, name of school, and name and contact information of your related subject matter teacher to:

Biotech Essay Contest  
 c/o Rhowan Sivel, Gowling Lafleur Henderson LLP  
 160 Elgin Street, Suite 2600  
 Ottawa, ON K1P 1C3

or submit electronically to [essaycontest@gowlings.com](mailto:essaycontest@gowlings.com)

\*Topics for Top Story of the Year should occur, or have been recognized as a notable advancement within the time frame of June 1, 2009 - May 30, 2010.

\*\*Laptop with approximate retail value of \$800.

\*\*\*iPod Touch with approximate retail value of \$200.

No purchase necessary. Win a bursary of up to \$5,000 for the first-year of tuition costs at a Canadian post-secondary institution, a laptop\*\* or iPod Touch\*\*\* (iPod Touch is a registered trademark of Apple Inc. Apple is not a sponsor of, nor a participant in, this promotion). To enter, send an original essay of up to 1,500 words on the topic of "Canada's Top Biotechnology Story of the Year" to Biotech Essay Contest, Rhowan Sivel c/o Gowling Lafleur Henderson LLP, 160 Elgin Street, Suite 2600, Ottawa, ON, K1P 1C3. Contest closes May 30, 2010. Contest is open to all Canadian high-school students who plan on starting their first year at a Canadian post-secondary institution in a life sciences-related field of study in the 2010 academic year, except those domiciled with employees of Gowlings, and the contest judges. Chances of winning depend on the number and calibre of entries received.

Visit [gowlings.com/essaycontest](http://gowlings.com/essaycontest) for contest rules and regulations. It is understood all submissions are an acceptance of the rules and regulations.



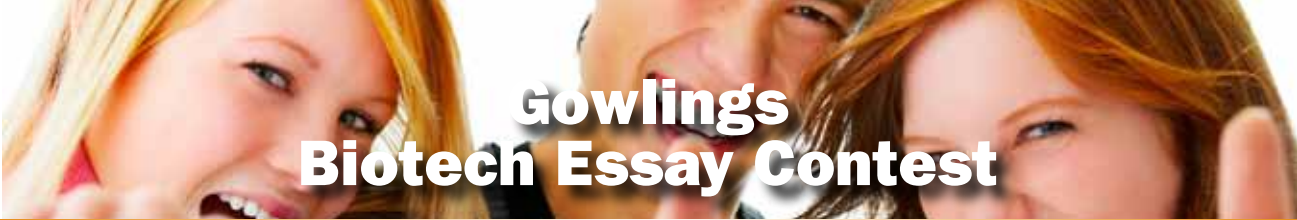
National Biotechnology Week  
 September 2010  
 La semaine nationale des biotechnologies  
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# Gowlings Biotech Essay Contest

## Rules and Regulations

1. The Biotech Essay Contest ("Contest") is being conducted by Gowling Lafleur Henderson LLP ("Gowlings"). Contest begins September 18, 2009 and closes with entries received by May 30, 2010.
2. No purchase necessary. To enter, send the following: (i) an original essay of up to 1,500 words, (typed or hand-written, double spaced, single sided on plain white paper) on the topic of "Canada's Top Biotechnology Story of the Year." Topics for Top Story of the Year should occur, or have been recognized as a notable advancement within the time frame of June 1, 2009 - May 30, 2010; Please include: (ii) the entrant's name, address, email address, telephone number, age and date of birth; and (iii) name, address, telephone number of entrant's parent or legal guardian if entrant is under the age of majority in his/her province/territory of residence, and (iv) the name of the school and contact information of the entrant's related subject-matter teacher, in a single postage-paid envelope to Biotech Essay Contest, c/o Rhowan Sivel, Gowling Lafleur Henderson LLP, 160 Elgin Street, Suite 2600, Ottawa ON, K1P 1C3, or by email to [essaycontest@gowlings.com](mailto:essaycontest@gowlings.com). Incomplete entries, or those without proper document sourcing (as per standards supported by your high school), will be automatically disqualified. Limit one entry per person.
3. Entries will be judged by a panel of judges made up of a cross-section of professionals from the biotechnology industry in Canada. Entries will be judged based upon the following three criteria, weighted equally: writing skills, creativity and accuracy. The decisions of the Contest judges are final in respect of any matter relating to this contest. In the event of a tie, the entry with the highest score on writing skills will win. Odds of winning depend on the number and calibre of entries received.
4. Contest is open to all Canadian high-school students who plan on starting their first year at a Canadian post-secondary institution in a life sciences-related field of study in the 2010 calendar year, except those domiciled with employees of Gowlings, and the Contest judges.
5. Three prizes will be awarded to the author of the top three winning essays. The first place winner receives a bursary of up to \$5,000 toward their first year of tuition costs at the Canadian post-secondary institution the winner plans to attend. The cash prize is for tuition only. Other expenses relating to the first year including housing and meals are not included. The actual prize value depends on the tuition cost at the relevant Canadian post-secondary institution but will not exceed \$5,000. The prize will only be awarded if the winner is planning on attending a Canadian post-secondary institution in a life sciences-related field of study in the 2010 academic year. If the winner is not planning on attending a Canadian post-secondary institution in a life sciences-related field of study in the 2010 academic year, the winner will be disqualified and the prize will be awarded to the runner-up. The second place prize is a laptop with an approximate retail value of \$800. The third place winner will receive an iPod Touch with an approximate retail value of \$200. (iPod Touch is a registered trademark of Apple Inc. Apple is not a sponsor of, nor a participant in, this promotion.) The first place prize will be awarded to the winner or the winner's parent or guardian, in the form of a cheque based upon sufficient proof, provided by the winner, of the actual tuition costs. Such proof may be in the form of an invoice or tuition slip from the relevant Canadian post-secondary institution. The second and third place prizes will be awarded via mail.
6. The winners will be contacted by telephone prior to the formal announcement of the winners. The formal announcement of the winners will be made during National Biotechnology Week 2010. If the winners can not be contacted by telephone after five attempts over 10 business days, the winners will be disqualified and the prize will be awarded to the runner-up.
7. The prizes must be accepted as awarded and are not redeemable for cash or transferable.
8. By participating, each winner or his/her parent or legal guardian, agrees to be bound by these Official Rules and agrees that Gowlings, and each of its respective affiliates and agents shall have the right and permission to use the winners' essay (in whole or in part), name, voice, city/province of residence, photograph, and/or likeness for advertising and/or trade and/or any other purpose in any media or format now or hereafter known without further compensation, permission, or notification. Winners may be contacted after their first year of university and offered the opportunity to report on their progress for use in contest promotional materials.
9. Each winner (or if the winners are under the age of majority in his/her province of residence, his/her parent or legal guardian) will be required to return a declaration of eligibility, liability release and publicity release by the date specified, or the prize will be awarded to the runner-up. By entering this Contest, the winners release and hold harmless Gowlings, their advertising agencies, partners, employees, directors and officers and the Contest judging organization from any liability in connection with this Contest or the prize.
10. All entries become the property of Gowlings which assumes no responsibility for postage due, lost, stolen, delayed, damaged, illegible or misdirected entries or entries that have been submitted through illicit means, or do not conform to or satisfy the Contest Rules or for failure of the Web site during the promotional period, for any problems or technical malfunction of any telephone network or lines, computer online systems, servers, access providers, computer equipment, software, failure of any e-mail or traffic congestion on the Internet or at any Web site, or any combination thereof including any injury or damage to an entrant's or any other person's computer related to or resulting from playing or downloading any material in the promotion. Gowlings reserves the right, in its sole discretion, subject to applicable law, to cancel or suspend the online portion of this contest should a virus, bug or other cause beyond the reasonable control of Gowlings corrupt the security or proper administration of the contest. Any attempt to deliberately damage any Web site or to undermine the legitimate operation of this promotion is a violation of criminal and civil laws, and should such an attempt be made, Gowlings reserves the right to seek remedies and damages to the fullest extent permitted by law, including criminal prosecution. Entries are subject to verification and will be declared invalid if they are illegible, mechanically reproduced, mutilated, forged, falsified, altered or tampered with in any way. Gowlings is not responsible for any errors or omissions in printing or advertising this Contest.
11. This Contest is subject to all applicable Federal, Provincial and Municipal laws and regulations.
12. By entering this Contest, you consent to Gowlings, its promotional agencies and the independent judging organization storing and using the personal information you submitted with your Essay for the purpose of administering this Contest.

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