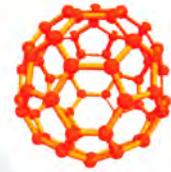


# YOUTH SCIENCE FOUNDATION CANADA MARCH IS YOUTH SCIENCE MONTH



# SERIOUS! FUN! 2008

Science is everywhere: from online games and ipods to snacks, sneakers and skateboards. And great science can come from anywhere: white-coated scientists in labs or kids in farm fields. Over 25,000 young Canadians enter local and regional science fairs each year, vying to be among the 450 or so who qualify for the Canada-Wide Science Fair. Youth Science Month celebrates the incredible work being done by Canadian youth.



They make things happen, turn inspiration into fully-realized projects. Every year, projects emerge that challenge accepted scientific knowledge. Meet five young Canadians that made adults stop and think.

Serious? Yes. Fun? You bet!



## WORMS, WHEELCHAIRS, SOYBEANS, STEM CELLS: SCIENCE REALLY IS EVERYWHERE

### BEN UNDERWOOD: LET EARTHWORMS DO THE WORK!

**Cultivating Cultivators**  
2007 EnCana Platinum Award Junior

Over \$8,500 in cash  
and scholarships



Sitting at the kitchen table, Ben Underwood asked his father, a farmer, a simple question – “Do certain kinds of manure attract more earthworms than others?” His Dad didn’t know, and when Ben couldn’t find any information on the internet, he took matters into his own hands. And started a science project.

Farmers often use earthworms as an enviro-friendly alternative to fuel-guzzling tilling equipment. Worms burrow tunnels through soil and help crops get the nutrients and water that they need. But has anyone ever asked how best to attract the worms?

Ben found farmers willing to donate a half-tonne each of hog, sheep, cattle and chicken manure. After letting the manure sit on test plots, he conducted earthworm counts over two test periods: four weeks and six months to check which manure was their favourite. As it turns out, they preferred cattle manure. And the least favourite? Hog manure! So, for farmers taking the environmental route, cattle manure is clearly the way to go.

Having won with worms in 2007, Ben is putting the finishing touches on his next science project, the details of which he won’t divulge, except to say its focus is health sciences.



Scenes from science: Physics, kinetics, acoustics, engineering. Serious fun!

## JOSH SEGEREN: SOY SCIENCE

**Soy Solution: Initial Moisture Effects on the Injury Resistance of Soybeans**  
2007 EnCana Platinum Award, Intermediate

Over \$8,500 in cash and scholarships



Growing up on a farm, Josh had the ideal outlook for a budding scientist – curiosity.

He noticed that from year to year, and even from field to field, there was a marked difference in the soybean yield. Why? What variables might be involved?

Soil, oxygen, water, light – these are things that farmers have always known to affect growth rates of germinating seeds. Soybean farmers control them to protect their crops from injury and produce healthy yields. Being too cold or too dry can hurt sprouting seeds. But could other factors help or hinder the growth rate of soybean seeds? Could the quality of the beans – and how much moisture they have – before they are even planted have an effect?

Absolutely! Josh found that different levels of moisture in a soybean before it has even sprouted affect how well it can resist injuries.

And different moisture levels help beans resist different injuries. Josh found that soybean seeds with initial moisture levels between 12% and 14% are the best at resisting injuries in most conditions. Chilling tends to be the most common injury afflicting soybean crops – therefore its prevention is a big issue for some agriculturalists. Josh's experiment gives soybean farmers an important tip on how to get the most out of their crops -- take note of soybean seed moisture levels and it will pay off in healthier crops! Studies like Josh's can have a big impact in the agricultural community, giving farmers a heads up on new and creative techniques for bringing in healthy yields.

A simple question with a significant answer took Josh to the CWSF. Having forged "powerful friendships with likeminded ambitious people from all over Canada," he now says he is inspired to work hard, keep asking questions, and will probably pursue a career in science!

## SERIOUS FUN

### AT THE CANADA-WIDE SCIENCE FAIR

Science is only part of the fun at the CWSF. It's the people they met and the things they got to do that participants remember.

At the 2008 CWSF, the Host Committee has organized a city chase, a mini-version of The Amazing Race. Check out [cwsf2008.ca](http://cwsf2008.ca) for all the details.



A parade with larger-than-life mannequins kicked off the CWSF in Saguenay-Lac St. Jean, Quebec.



A little volleyball, and a lot of food, on the beach, in Vancouver, British Columbia

## START THINKING ABOUT NEXT YEAR'S SCIENCE PROJECT NOW!



Excited about science? Start planning next year's project now – the SMARTS network is here to help! Made up of kids who are enthusiastic about science and technology, SMARTS offers resource guides, expert Q&A, online forums and much more to give you the low-down on programs, events and competition.

Check out [www.ysf-fsj.ca/smarts](http://www.ysf-fsj.ca/smarts)



Craggy rocks, crashing waves – and of course the famous lighthouse at Peggy's Cove, Nova Scotia.

# EMILY COOLEY: STEM CELL STAR

**Embryonic Stem Cells and Viral Internalization**  
2007 EnCana Best in Fair Award, and EnCana  
Platinum Award, Senior

Over \$27,500 in cash  
and scholarships



While Ben and Josh's projects came out of observing things around them, Emily Cooley's was a bit different. The subject of her experiment – stem cells – can't even be seen with the naked eye; so it was in a lab that her idea first took shape. And what she discovered was by no means kids' stuff.

In 10th grade, Emily was fascinated by science and hungry to learn more. When a position as a lab technician opened at Dr. Derrick Rancourt's University of Calgary molecular biology lab, she jumped at the chance to apply. A Masters grad got the job – but Dr. Rancourt was so impressed by Emily that he offered her a chance to learn the ropes as a summer scholarship student.

Lab tools, enzymes, open flames and proteins – it was all pretty intense for someone who had never had a job before! But it led Emily to her first science fair effort – growing bone cells from the embryonic stem cells of mice – and she continued working at the lab throughout high school. The project took her to the Sanofi-Aventis Biotech Challenge and the 2006 CWSF in Saguenay, Quebec – which she describes as a highlight of her high school career.

Back in the lab after her first success, Emily was inspired, and set on designing and carrying out an experiment all her own. She knew that she wanted to undertake the extremely delicate process of working with stem cells and decided to explore whether it was possible to combat cancer recurrence by studying and manipulating these fragile cells.

Emily's project designed a new method of destroying cancer stem cells while leaving other cells in the body untouched. She also developed a brand new procedure for revealing which proteins can find their way into those cancerous stem cells – something that had never been done before, and could lead to the creation of more effective cancer treatments.



A blustery excursion to North America's most easterly point, Cape Spear, Newfoundland.



Spying on Puffins, Murres and Kittiwakes at one of the world's largest seabird colonies, Newfoundland.



Crossing the famous suspension bridge over British Columbia's Capilano Canyon.



Ben Underwood, Emily Cooley and Josh Segeren at the EnCana Platinum Breakfast.

## TAKING THE NEXT STEP

Want to take your project to the podium? Team Canada and CWSF alumni have collaborated on a guide for kids who have competed at regionals or the CWSF, but want to take their projects to the next level. The Stepping Up Guide offers hints on experiment design, how to get access to equipment, impressing the judges and having fun. This guide is a great resource for science-loving young Canadians!

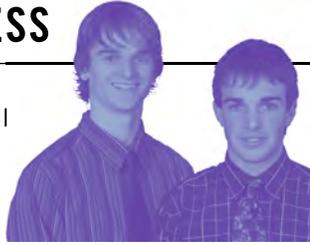
Check out <http://steppingup.ysf-fsj.ca>



A surfacing whale is spotted off the coast of Newfoundland.

## SERIOUS FUN IS SERIOUS BUSINESS

Simple mechanics took Mike Ehman and Colby Mainil all the way to the 2006 CWSF, where their Step Climbing Wheelchair won the prestigious Manning Young Canadian Innovation Award.



Simple persistence is getting it closer to the people it's meant to help. Since 2006, Mike and Colby have been finding out what it takes to put together a business and commercialize their innovation.

Last fall, they were invited to Toronto to present their project to investors, researchers and professionals in the personal care design field. Andy Hart of Hart Mobility, who has since become a mentor, is helping them understand what it takes to make a business work.



The Step-Climbing Wheelchair continues to change and evolve. Inventions don't spring into the minds of their inventors fully-formed, in a big "eureka!" moment. "[It] will always be a work in progress," says Mike. "We have just the bare bones of what this project could potentially be." Now finishing second year university, Mike and Colby continue to improve their design and assess the best materials for durability, cost and aesthetic appeal. Under review by several international mobility companies, the Step-Climbing Wheelchair – a high-school physics project – continues to inch its way to market.

## HAVE YOUR OWN SERIOUS FUN!

Environmentally friendly agricultural practices, storing seeds, fighting cancer and changing the urban mobility landscape – Canadian kids do it all. As the science fair season gets underway, check out what kids in your community are getting up to – you may just be surprised and inspired. Maybe you'll even start thinking about next year's science project.

Start asking questions. Recognize the science that's a part of the things you care about. See the fun in serious stuff – and we'll see you at the science fair!



Quebec's Laurent Fradet, Team Canada 2007, Determination of the Optimal Barium Sulfate Concentration in a Bone Cement



Alberta's Emily Cooley, 2007 EnCana Best-in-Fair and EnCana Platinum Award, Senior, Embryonic Stem Cells and Viral Internalization

## ART, MEET SCIENCE

Art and science both involve imagination and originality. This year, for the first time, YSF's EnviroExpo Program: the EnviroExpo Special Awards at a number of regional fairs, and the Environmental Innovation division at the CWSF, dares kids to think differently – combining art and science to tackle an environmental challenge.



Presented by VIA Rail, you can get full details at [www.ysf.ca/Competitions/EIProgram/](http://www.ysf.ca/Competitions/EIProgram/) and [www.viaenviroexpo.ca](http://www.viaenviroexpo.ca).

### Foundation Partners

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