THE ALBERTA SCIENCE TEACHER

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From the Editor

Alberta Education recently held Your Future Starts Here, a symposium on high school completion. Our province has the very real problem of low rates of high school completion. Only about 75 per cent of our students finish their high school requirements within five years of beginning Grade 10; the province's long-term goal is at least 90 per cent.

About 700 people attended the symposium, including representatives from government, business and education. There was also a significant youth contingent. The event, held on September 24 and 25, involved more than just speakers. Those in attendance also experienced some wonderful youth entertainment and heard powerful testimonials from students who had made the decision to drop out of school.

The goal was to get everyone together to share ideas and solutions for helping more students complete high school. Before attending the symposium, I held the common view that Alberta's strong economy was drawing students away from classes. Why stay in school when well-paying jobs can be found nearly everywhere? I quickly learned that I was wrong in my assumptions.

The young people cited low self-esteem as the main reason for leaving school. A variety of factors appear to contribute to this low self-esteem. Of significance is poor home support. Many students told stories of the difficulty of staying in school when there is no food, no parent, drug abuse or physical abuse at home. As educators, we have difficulty addressing what goes on at home. But another significant reason for dropping out of school came up in the discussions: many students have a poor relationship with school. It is here that teachers have a direct impact. Many times it is not a cost issue, either.

I found it very meaningful when I heard that many students who had left high school felt that

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The Alberta Science Teacher is one of the official publications of the Science Council (SC) of the Alberta Teachers' Association. SC Bylaw 9.4 states: *The Alberta Science Teacher* shall reflect on the contributions and activities of Alberta science teachers in the classroom.

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a teacher had been unfair or had treated them poorly. Students who struggled academically left school because they felt that there was no support to help them learn. Lessons were taught in abstract ways. Courses had no meaning for them. Hearing this was difficult, because it is something I try very hard to work on.

I became a science teacher because I like the subject. I have always found science easy and fun to learn. This can be a problem. I work at finding different ways to address concepts, to reach those students who struggle with science. I've incorporated hands-on lessons and experiments, as well as giving my students opportunities to read, watch, listen and write about science.

The Alberta Teachers' Association Science Council (ATASC) has been a great resource for me. It has allowed me to attend some excellent conferences with top-quality speakers, watch the website grow with the addition of the resource database and meet some truly talented science teachers.

It saddens me to say goodbye as my editorship comes to an end. I welcome Andi-Lynn Bender as the new editor of *The Alberta Science Teacher.* You can look forward to some great newsletters in the future. I know that the council is in good hands and that it will be around to help me and many other teachers in our science classes. Take advantage of what your council has to offer.

Derek Collins

Conference 2006

"Conquering the Challenges"

Delta Lodge at Kananaskis, Kananaskis

November 16–18

The Conference 2006 plans have been finalized, and it is shaping up to be a great conference!

The conference will begin on Thursday evening with a reception and an opportunity to view the video *The Score.* The following two days will feature all new keynote speakers, topic-specific workshops at all grade levels, general-interest sessions and exhibitor displays, as well as social activities and guided walks. The sessions will be held at the Delta Lodge at Kananaskis and at the Kananaskis Field Station, a scenic 15-minute drive away.

Justin Trudeau will open the conference on Friday morning with his keynote address "Science, Engagement and Youth," followed by a small group session. The education and empowerment of young people are professional and personal priorities for Justin. The other keynote speakers are Joe Schwarcz (aka "Dr Joe"), director of McGill University's Office for Science and Society and host of "The Dr Joe Show"; Ben Gadd, naturalist and author; and Paul J Fox, professor of marine geology and geophysics in the College of Geosciences at Texas A&M University. Detailed biographies are included on the conference website (www.atasc.ab.ca/conference/).

The banquet and awards ceremony on Friday night will be followed by a dance with Class Act DJ.

Saturday morning's presenters include Elizabeth Cannon, the newly appointed dean of engineering at the University of Calgary; Keith Bagnall, last year's ATASC Distinguished Service Citation winner and a medical professor at the University of Alberta; and Lisa Christensen, an art historian who will discuss the relationship of science to the Canadian Rockies art of the Group of Seven and other painters.

Sessions will run Friday and Saturday, allowing you to return home and spend Sunday with your family or enjoy another day of leisure in beautiful Kananaskis. Lunch on Friday is included with advance registrations.

For more details about sessions, accommodations and registration, visit www.atasc.ab.ca/conference/.

Join your colleagues for a weekend of science professional development in one of Alberta's most beautiful places!

Alberta Education Science Programs Update

Senior High Science

Science 20-30

The recent debate over Pluto and other planets gives teachers an opportunity to bring to life scientific processes and debate. The new Science 20 program of studies and the associated learning and teaching resources can also assist teachers in this regard. The resources demonstrate the integrated nature of the course. The text portion uses a magazine format and interactive design to facilitate student engagement and discovery. The electronic component is designed to maximize instructional flexibility and to promote evergreening of the material. Alberta educators can download the Science 20 learning and teaching resources for free from Alberta Education's Tools4Teachers website (www.tools4teachers.ca/t4t/). Digital distance learning student guides and materials for Science 20 can be found in the student resource CD included with the basic Science 20 text package.

Basic resources for Science 30 are in development and scheduled to be available from the Learning Resources Centre (LRC) in the summer of 2007. Distance learning materials will also be included in the Science 30 resource package.

Biology 20-30, Chemistry 20-30 and Physics 20-30

Special thanks to the teachers who were involved in field testing the programs, resources and assessment items. Their feedback contributed to the development of curriculum materials. The material for these 20- and 30-level courses will be combined into one textbook for each core discipline, which will be available in early 2007.

The following publishers are developing the resources:

- Biology 20-30—McGraw-Hill Ryerson (English and French), Thomson Nelson (English)
- Chemistry 20-30—McGraw-Hill Ryerson (English), Thomson Nelson (English and French)
- Physics 20-30—Pearson Education Canada (English and French)

The publishers will showcase their draft resources at the upcoming ATASC conference.

Distance Learning

Distance learning courses for Biology 20, Chemistry 20 and Physics 20 will be available in September 2008, followed by materials for Biology 30, Chemistry 30 and Physics 30 in September 2009. The distance learning materials for Biology 20-30 will be wrapped around the McGraw-Hill Ryerson resource. The distance learning materials for Chemistry 20-30 will be wrapped around the Thomson Nelson resource.

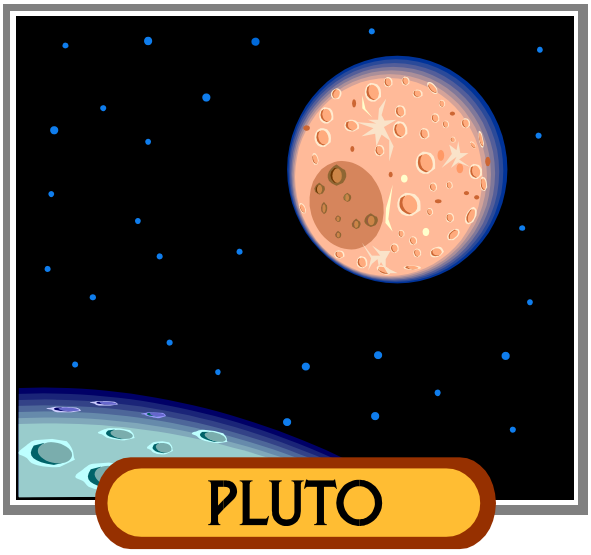
Distance learning materials have been included in the Science 20 resources and will also be a component of the Science 30 resources.

Implementation

An implementation schedule is available at www.education.gov.ab.ca/k_12/curriculum/impshed_ref.pdf. Provincial implementation of Biology 20, Chemistry 20, Physics 20 and Science 30 is scheduled for September 2007, followed by implementation of Biology 30, Chemistry 30 and Physics 30 in September 2008.

Regional sessions to support the implementation of Science 20 in 2006/07 and the upcoming implementation of Biology 20, Chemistry 20, Physics 20 and Science 30 in 2007/08 will be offered through the Alberta Regional Professional Development Consortia (ARPDC) in the 2006/07 school year. Throughout the sessions, teachers will be actively engaged in learning about the revised programs and the new resources. The sessions will also include information on the *Safety in the Science Classroom* resource. For more information, contact Glenn Zacharuk at Glenn.Zacharuk@portagecollege.ca or visit the ARPDC website (www.arpdc.ab.ca).

For information regarding programs, contact Caroline Nixon



at caroline.nixon@gov.ab.ca or (780) 427-9593. For information regarding programs in the French language, contact François Lizaire at francois.lizaire@gov.ab.ca or (780) 422-7992. To be connected toll free within Alberta, dial 310-0000 first.

Support Resources

A call for support resources will be sent out to resource developers and publishers in late 2006. Selection of suitable resources is scheduled for early 2007. For information regarding resources, contact Vic Romanyshyn at vic.romanyshyn@gov.ab.ca or (780) 415-8958. To be connected toll free within Alberta, dial 310-0000 first.

LearnAlberta.ca

LearnAlberta.ca is responsible for designing and developing multimedia learning resources to support educational program delivery in Alberta. High school biology has been identified as a priority. Initial planning regarding the biology concepts to be addressed has begun, and development work is scheduled to begin in the spring of 2007. For more information or to provide input on this project, contact Wade Strass at wade.strass@gov.ab.ca or (780) 422-3280. To be connected toll free within Alberta, dial 310-0000 first.

French-Language Resources

The Biology 20-30 student and teacher resources developed by McGraw-Hill Ryerson, the chemistry resources developed by Thomson Nelson and the physics resources developed by Pearson Education Canada will be translated and contextualized into French. The student resources will be ready for the implementation of the 20-level core sciences in September 2007, with the teacher resource guides to follow. The Science 14 and Science 24 teacher resources will be available from the LRC in late fall. The *Safety in the Science Classroom* document will be available in December. For more information regarding French-language programs and resources, contact François Lizaire at francois.lizaire@gov.ab.ca or (780) 422-7992. To be connected toll free within Alberta, dial 310-0000 first.

Elementary Science

A needs assessment and review of the elementary science program and resources was conducted during the 2005/06 school year. A summary of the feedback is available at www.education.gov.ab.ca/k_12/curriculum/bySubject/science/elereview.pdf. Work on the elementary science program is in the preliminary stages. Provincial implementation of kindergarten to Grade 3 is now scheduled for September 2011, followed by implementation of Grades 4–6 in September 2012.

Superintendents and the ATA will be invited to nominate teachers to participate in the Elementary Science Advisory Committee for a two-year term. The committee members selected will represent a cross-section in terms of grade level, gender, experience and student groups served. For more information, contact Caroline Nixon at caroline.nixon@gov.ab.ca or (780) 427-9593, or Bernie Galbraith at bernie.galbraith@gov.ab.ca or (780) 422-3218. To be connected toll free within Alberta, dial 310-0000 first.

Safety in the Science Classroom

Safety in the Science Classroom is available from the LRC and also at www.education.gov.ab.ca/k_12/curriculum/bySubject/science/screport.pdf. This safety resource has been developed for use by administrators, teachers, lab technicians and other school system staff. The resource identifies roles in promoting safety, provides information regarding hazards and strategies for minimizing risk, and will enhance the implementation of the newly revised science programs. To support the release of the resource, the ARPDC is offering full-day workshops. Dates and locations for these sessions are listed below. Further information and online registration is provided on the websites. Look for the sessions called Safe Science: Maximizing Quality While Minimizing Risk.

East Central Regional Consortium (Learning Network)
www.learning-network.org
St Paul—October 16
Wainwright—October 17

Northwest Regional Learning Consortium
www.nrlc.net
Grande Prairie—October 20

Southern Alberta Professional Development Consortium
http://people.uleth.ca/~sapdc/
Medicine Hat—October 24
Lethbridge—October 25

Calgary Regional Consortium
www.crcpd.ab.ca
Calgary—October 26

Central Alberta Regional Consortium
www.carc.red-deer.com
Red Deer—October 30
Camrose—October 31

Edmonton Regional Learning Consortium
www.erlc.ualberta.ca
Fort McMurray—November 2 (half-day session only)
Edmonton—November 3

For more information, contact Vic Romanyshyn at vic.romanyshyn@gov.ab.ca or (780) 415-8958, or Bernie Galbraith at bernie.galbraith@gov.ab.ca or (780) 422-3218.

Outstanding Science Teacher Award

Do you know an outstanding science teacher?

The ATASC is seeking nominations for its Outstanding Science Teacher award. This award recognizes excellence in science teaching in Alberta, including contributions to science teaching in the form of articles, workshops, curriculum development or other instances of professional development. Strong consideration will be 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 will be presented to the recipient at the annual conference banquet. Travel expenses and one night's accommodations and meals will be covered by the council. The recipient will be asked to share his or her approach to science teaching either by writing an article for an ATASC publication or by being interviewed by the editor (or a designate).

A nomination form is available at www.atasc.ab.ca/nominations.html.

Resources for Climate Change Education

Climate and climate change are regular topics in the news, as well as in the provincial science curriculum. The websites noted below provide excellent support for teaching and learning about climate.

NASA's Earth Observatory (http://earthobservatory.nasa.gov/Observatory/) is an incredibly rich site, providing visitors with access to data sets collected by satellite in the categories of atmosphere, oceans, land, life on Earth, and heat and energy. The data can be visualized by downloading animations that depict changes in the data over time. These false-colour images are superimposed on a map of the Earth and play as QuickTime movies. The animations take a while to build, even with a high-speed Internet connection, but allowing your students to watch a hole in the ozone form and then disappear based on actual satellite measurements taken over several decades is a powerful way to convey this information to students.

Environment Canada's Green Lane (www.ec.gc.ca/envhome.html) is an excellent source for weather and environmental information. It links you to the Weather Office (for current conditions and forecasts across Canada), *EnviroZine* (Environment Canada's online newsmagazine) and a wealth of information on Canadian acts, regulations and programs relating to the environment.

Another useful website is the National Climate Archive, which contains data on Canadian climate normals or averages from 1971 to 2000 (www.climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html). To use this tool, type in a Canadian location and then click the Search button. Select a weather station. Thorough climate information collected at that weather station appears, including temperature (daily average, daily and extreme maximum and minimum, number of days above specified temperatures), precipitation (rainfall and snowfall, a breakdown of the number of days with given amounts of precipitation), wind speed and direction, humidex, wind chill and radiation data.

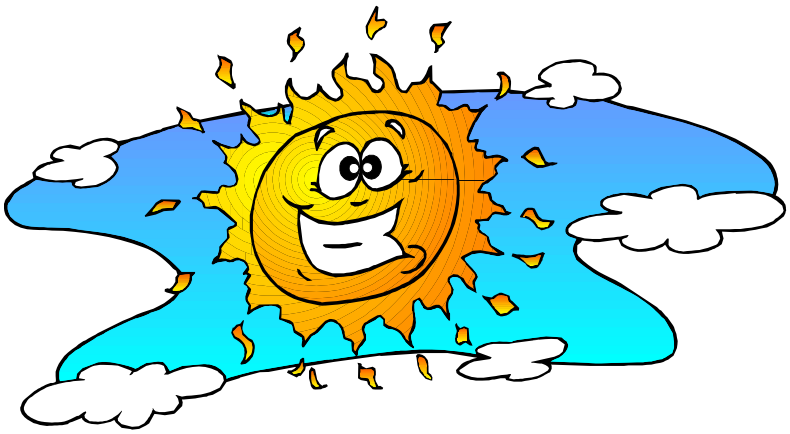
Education About Global Climate Change: From the Media or the Teacher?

As I sit in my basement, hiding from the heat of the 33-degree day and watching the news, I am struck by the inundation of references to climate change that we face daily. The news crew says that the heat wave seems ominously indicative of larger changes, openly wondering if this is climate change. Next is a report on how those living along the Gulf of Mexico are reacting with a mix of paranoia, stubborn resolve and optimism when they hear predictions of increasing hurricanes in the area. People everywhere are talking about climate change, but this talk seems based mostly on misinformation, and it is creating a *climate* of fear and confusion.

Films such as Al Gore's *An Inconvenient Truth* present us with many ominous predictions, but they do so with relatively good science and the desire to create a willingness to change. They aim not to say, "People of the earth, despair and prepare for the worst," but, rather, to inform us about what is causing global climate change and what can be done to help the situation. The message is one of hope and action—with the proviso "before it is too late."

What, then, is causing the misconceptions people have? Why does the average person still believe that the thinning ozone layer is either the cause of climate change or essentially the same issue? In the third assessment report of the Intergovernmental Panel on Climate Change (IPCC 2001), *every* scientist involved confirmed that humans are influencing global climate in definable ways. Yet more than half of the media reports on climate change indicate that its causes are not known, that humans may not be a significant factor and that it may be a naturally occurring phenomenon.

As teachers, do we have a role to play in educating students about global climate change? When a news reporter states that a heat wave is climate change, is it important that students realize that, no, in fact, that is just weather? That they recognize that the SUV they want to drive, or the conspicuous consumption they have had modelled for them by our and previous generations, will in fact have a long-term impact on our environment in ways that are difficult to predict? Certainly, I would rather have my students learn about climate change, its causes and outcomes, from me—their science teacher—than from the sensationalistic media or from political parties or special-interest groups, who may misrepresent the situation for their own purposes.



For high school science teachers here in Alberta, educating students about climate change is not supposed to be a choice. In Science 10, a required subject for most students in Alberta, Unit D: Energy Flow in Global Systems focuses on topics such as climate change and the role of water in our environment. Students should be exposed to some of the science behind global climate change. Unfortunately, Unit D is not valued by all Science 10 teachers, and it is often the first unit sacrificed when it is crunch time and something must be cut from the course. Teachers are pressured in many ways, not the least of which is pressure for good diploma exam results, and many consider Unit D to be expendable because it has little impact on students in their 20- and 30-level science courses, which ultimately determine how they do on the diploma exam. Fortunately, not all teachers follow this inclination.

At a recent Centre for Research in Youth, Science Teaching and Learning (CRYSTAL-Alberta) workshop on using visualizations to teach climate change, led by researchers at the King's University College Centre for Visualization in Science, teachers expressed much concern over the secondary role climate change is being given in high schools. For the most part, they were there to learn more about climate change themselves and to find ways to better present

the material to allow their students to predict, control and see the outcomes of factors influencing climate change. They agreed that education on climate change in Grade 10 has little influence on their students' diploma exam scores but, looking at the bigger picture, they believed that being knowledgeable about climate change—an issue that will have a huge impact on their lives—is crucial for their students.

As teachers, we are continually making choices about how and what we teach our students. Many decisions seem out of our hands, because we are expected to follow a curriculum, stick to a timeline, produce good exam results and so on. However, the classroom activities we do, the amount of time we spend on a topic and the emphasis we place on the topic are still, for the most part, within our control.

Students need to learn about climate change—not for the sake of adding another concept to the list of prerequisite exam knowledge but, rather, so that when they are exposed to the news reports, they can *act* with informed insight rather than *react* with emotion and despair.

For more information on the visualizations being developed, attend the workshop by King's University College scientists Peter Mahaffy and Brian Martin, to be held November 17 at the Science Council conference in Kananaskis.

Reference

Intergovernmental Panel on Climate Change (IPCC). 2001. *Third Assessment Report.* Hearing before the Committee on Commerce, Science, and Transportation, United States Senate, One Hundred Seventh Congress, first session, May 1. Washington, DC: US Government Printing Office. Also available at http://purl.access.gpo.gov/GPO/LPS46386 (accessed October 6, 2006).

Mark Hirschkorn

Let's Do Science: A Great Resource for Elementary Science Teachers

Let's Do Science is a guide for elementary school teachers that has been developed by the Science Alberta Foundation as a framework for planning, implementing and evaluating hands-on science programs in the classroom. This invaluable guide provides relevant information by grade and is linked to Alberta's elementary science curriculum. Teachers can incorporate its suggestions in their long-range, short-range and daily planning.

A printed copy or a searchable CD-ROM is available in your school library. You can also view or print a PDF copy by going to www.sciencealberta.org and looking under the Educators menu (at the top of the screen).

Great New Crates from the Science Alberta Foundation

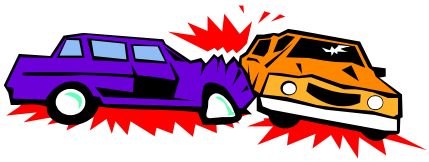
Since 1993, the Science Alberta Foundation has been providing schools, libraries, museums and interpretive centres with amazing ready-made science resources through its signature Science-in-a-Crate program. Each trunk-sized crate is self-contained and includes hands-on and minds-on interactive activities. The activities are innovative and engaging, and they tie directly to Alberta Education's science and mathematics curricula.

The interactive crates encourage skills in scientific inquiry, problem solving, team building and communication. The crate sets the stage—whether it be a crime scene, a dinosaur dig or a chemical spill—and transports students to a place of wonder, where they become medical investigators, toxicologists, biologists, mathematicians, architects or environmental scientists, to name just a few.

Currently, the crates visit one in eight classrooms in Alberta, reaching more than 85,000 students in 3,500 classrooms.

The Science Alberta Foundation is excited to introduce six new crates.

CSI: Collision Scene Investigation

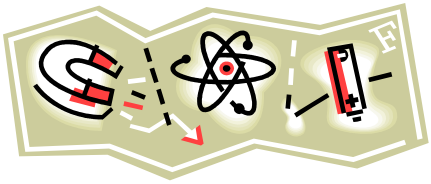


Applied Mathematics 10 (Relations and Functions); Pure Mathematics 10 and Mathematics 14 (with adaptation)

The Collision Scene Investigation crate introduces the techniques involved in collecting and evaluating evidence left at the scene of a collision. Through seven hands-on inquiries, students will assume the role of a collision reconstructionist, employing the science and mathematics used at collision scenes. After evidence has been collected and analyzed, students will answer questions that challenge them to interpret the data they've obtained. This crate was made possible through funding from the Actuarial Foundation of Canada.

E-Factor: Common Energy Conversions

Science 24 (Understanding Common Energy Conversion Systems)



From alternative energy and fuel efficiency to counting calories and comparing chemical reactions, E-Factor examines all aspects of energy in our everyday lives. Using a series of magazine articles, students will tackle activities such as budgeting their energy use, experimenting with the generation of alternative energy, calculating their maximum required daily caloric intake, measuring the fuel efficiency of cars and inventing a unique energy-saving appliance. Each article also showcases two career choices in the field. This crate was made possible through funding from EPCOR Utilities.

Extreme Alberta Challenge

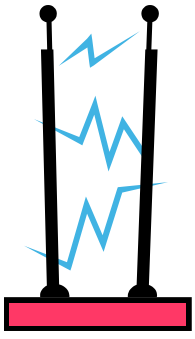
Grade 9 (Biological Diversity); also available in French

Students will discover the variety of life in unique Alberta habitats and analyze how the

Extreme Alberta Challenge, a multi-leg adventure race, may affect the plants and animals en route. Students will help perform the necessary environmental assessments and analyze the outcomes. The activities showcase real-life examples of field-research techniques, species at risk in Alberta, and species- and habitat-management practices. This crate was made possible through funding from Friends of the Science Alberta Foundation.

Information Assurance: Electrical Principles

Grade 9 (Electrical Principles and Technologies); bilingual crate



The Information Assurance Company, specializing in data information security and encryption services, is building seven new secure facilities worldwide, which participants will help design. Students will explore the form and function of many electrical devices, systems and processes that are part of our technological environment. In combination with these technologies, electrical principles will be used to show the transfer of energy, control of mechanisms and transmission of information in different forms. A complementary interactive online

activity called Save the World is available at www.wonderville.ca. This crate was made possible through funding from the Cadmus Foundation and the Cadmus Fund at the Calgary Foundation.

Making Waves: Hearing and Sound

Grade 3 Science (Hearing and Sound)

Follow Crash the Robot as he prepares to make a movie about sound. The activities range from experimenting with instruments and monkeying around at the zoo to soundproofing a studio and learning how sound travels through solids, liquids and gases. Students are encouraged to think about various forms of communication, sounds made by vibrations, the dangers of exposure to loud sounds, and the range of hearing among animals and humans. Although the crate focuses on the Grade 3 science program of studies, it also integrates components of the social studies, language arts, math, information and communication technology (ICT) and music curricula. Be sure to check out the online interactive activity How We Hear at www.wonderville.ca. This crate was made possible through funding from Alberta Innovation and Science and the Allard Foundation.

Team Aquatica: Fresh and Salt Water Systems

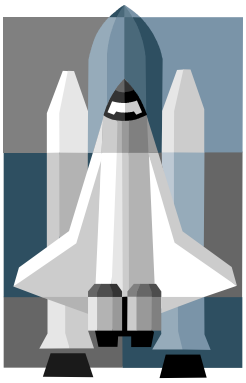
Science 8 (Freshwater and Saltwater Systems); also available in French

Explore all aspects of aquatic ecosystems by diving deep into fresh and salt waters with a wacky group of colourful superheroes! From collecting and interpreting data found in glacial core samples to determining the potability of drinking water, students will use scientific principles to investigate fresh and salt water systems and processes. This crate was made possible through funding from ConocoPhillips Canada.

Also available is a new camp crate, meant for use at science camps.

Camp ISS: Life on the International Space Station

Here's a chance to step aboard a space shuttle and investigate the International Space Station (ISS)—learning how astronauts live, work and play while orbiting Earth. Camp ISS is part of the Science Alberta Foundation's Complete Camp Kit series. Packed in several large trunks, the kits are bursting with science activities tailored to pique the interest of all children, regardless of learning style. Each kit comes with one week's worth of fun-filled activities with an exciting science theme. Camp ISS offers exciting challenges that get kids thinking about Canadarm2 robotics, recycling body waste for drinking water, the effects of microgravity, astronaut training and spacesuit fundamentals. The 60- to 90-minute activities are a great way to work science into any camp program or community event. The cost of this kit is $100. The kit was made possible through funding from NSERC's PromoScience and Merck Frosst Canada.



To book these new resources or to see the Science Alberta Foundation's other crates, go to www.sciencealberta.org and follow the easy instructions for reserving a crate online. The cost for booking a crate is only $25, which includes delivery to your school.

Do You Podcast? You Should!

If you already know what this article is going to be about, I would love to hear from you. Send your favourite podcasts to dcollins@atasc.ab.ca. Better yet, tell me if you make your own podcast and how you find it useful.

If you are confused, don't worry. I will explain what a podcast is and how great podcasts can be in the science classroom.

Like many Internet-related terms, *podcast* is an amalgamation of terms. *Pod* refers to iPods, which (along with other MP3 players) have become prevalent. You most certainly are either allowing your students to listen to them in class or confiscating them. I haven't seen a student with a CD player for at least a year now. *Cast* refers to sending out information. This usually involves voice only; however, videocasts are becoming more prominent. So, essentially, a podcast is a radio broadcast sent over the Internet.

There are countless podcasts available. Most of them are created by people using the Internet to carry their opinions out to the masses. The great thing for us science teachers is that radio stations and some dedicated people are putting out top-quality material. This allows us and our students to listen to news, interviews and entertaining how-tos in the classroom. Teachers can build up a library of podcasts that can enhance their lessons.

As an example, my favourite radio show is *Quirks & Quarks* on CBC Radio One (http://cbc.ca/quirks/). I have been listening to this show for at least two decades. Unfortunately, though, I'm rarely near a radio on Saturday at noon, and I've missed many great shows. Another teacher gave me a cassette tape on which he had recorded a *Quirks* special on Isaac Newton. My Physics 20 students listen to that show in the unit on forces, and they quickly realize the genius and oddity of this scientific giant. Now, as a podcast, *Quirks* can be downloaded automatically by my computer. I use iTunes (www.apple.com/itunes/), but there are other programs out there. Now I have a library of past shows that I can use in class. On December 3, 2005, the show featured a series of stories related to global warming. This has become a great addition to my Science 20 and 30 classes when we discuss environmental issues. It is another source of reliable and current information for students. And I no longer have to interrupt my Saturday chores to wait by the radio and hit the record button!

Another favourite podcast of mine is *Slackerpedia Galactica* (http://slackerastronomy.org). This is an example of nonprofessionals adding their voice to the airwaves. Element List (www.elementlist.com), which provides links to the best science resources, describes this podcast as follows:

> A weekly news event in the world of astronomy as told by professional astronomer slackers. Bad humor, sci-fi jokes and clips are the norm. And since this is their day job, they often cover stories not picked up in the mainstream press and also respect the intelligence of the audience. Think Dr. Who combined with Carl Sagan and Car Talk. Hosted by Pamela Gay and Travis Searle. Also check out the Slacker Astronomy Extra Feed for bonus interviews and chit chat shows.

Each podcast is short (5–15 minutes). I don't let my class listen to every one, but I select the podcasts related to topics we are studying (such as black holes or comets) or just interesting stories.

Podcasting has given us the freedom to listen to familiar shows, such as *Quirks & Quarks*, at our convenience, but it has also made great shows like *Slackerpedia Galactica* possible. Before podcasting, probably only ham radio operators had the freedom to add their voice to the airwaves. I see a great future in education for this technology. Perhaps students will soon be downloading podcasts selected by their teachers and listening to them at home. Maybe teachers will podcast their lessons and lectures so that students can carry them along with their music. Podcasting is a movement away from the portable written word to the portable spoken word. I hope to let you know about other useful podcasts in future issues.

Did I mention that it's all free?

Derek Collins

AMEC Scholarships for Women in Engineering

Note: The deadline for application for this year's scholarships has passed. This information has been included here to make you aware of the opportunities that exist for your female students who intend to pursue studies in engineering.

Women from across Canada are invited to apply now for two new annual scholarships from AMEC.

AMEC has partnered with the Canadian Engineering Memorial Foundation (CEMF) to provide the two scholarships for women in engineering beginning this fall.

AMEC is funding a new $10,000 scholarship for women pursuing their studies in engineering at the master's level, and a new $5,000 scholarship for Aboriginal women pursuing undergraduate studies in engineering. As well, AMEC is ensuring that graduate women will have the opportunity to gain valuable work experience by offering summer employment to the master's scholarship recipients.

Criteria and guidelines are now posted at www.cemf.ca. The deadline for application is **October 20.**

"The AMEC scholarships create opportunities for women in engineering. It's about investing in their future and helping them fulfill their aspirations to become leaders in their field," says Michael Jolliffe, vice-president, Government Relations and Communications, AMEC. "We want to attract high-calibre women engineering students to apply and use this financial support and summer job opportunity to pursue a career in engineering. Everything is set up and ready to go—we are now ready to move to the next stage of the scholarship process, which is reviewing applications."

The scholarships will be awarded based on the applicants' leadership, extracurricular activities and dedication to encouraging more women to enter engineering rather than on academic performance.

"We encourage all universities, WISE [Women in Science and Engineering] clubs, provincial associations and others who are in contact with female engineering students to promote these scholarships to the young women," says Suzelle Barrington, CEMF president. "Our scholarship winners are recognized as leaders across Canada and are provided with great networking opportunities, job experience and financial support."

CEMF now offers 10 scholarships at the graduate and undergraduate levels for women in engineering. Criteria, guidelines and deadlines for application are posted at www.cemf.ca.

CEMF was founded in 1990 to develop scholarship and award programs encouraging women to choose a career in engineering and to honour the memory of the 14 women at École Polytechnique whose contributions were abruptly ended on December 6, 1989.

AMEC is an international project management and services company that designs, delivers and supports client assets for customers across the public and private sectors. AMEC employs more than 20,000 people working from a network of offices throughout the UK, the US and Canada, as well as regional offices and projects worldwide. AMEC shares are traded on the London Stock Exchange, where the company is listed in the Support Services Sector (LSE: AMEC: L). AMEC has approximately 4,000 employees operating from 74 offices across Canada. The magazine *Engineering News-Record* has ranked AMEC as the leading international design firm in Canada.

For more information, contact Meghan Howard, assistant executive director, CEMF, at 1-866-883-2363; or Michael Jolliffe, vice-president, Government Relations and Communications, AMEC, at (905) 829-5400.

Science Exhibition 2009

The Musée de la Civilisation in Quebec City, jointly with MITACS (Mathematics of Information Technology and Complex Systems) and Université Laval, is proposing Science Exhibition 2009, to showcase cutting-edge science.

The theme will be "Science and the Future," and the intention is to give patrons an interactive, hands-on experience. Topics will cover a broad spectrum of disciplines, including (but not limited to) the life sciences, physical sciences, mathematical and computational sciences, engineering, health sciences and social sciences. Although the target audience will be high school students and teachers, the exhibition will likely be of interest to members of the general public, also. The goals are to show connections between science and its applications, to stimulate young explorers to discover the beauty of science, and to inspire students to pursue scientific education and careers.

The museum is proposing to host the exhibition for approximately 12 months, after which it may move to other venues.

Earlier this year, a call for ideas for specific aspects of cutting-edge science to be presented at the exhibition was sent out, and the submissions were received at the end of May. The main criteria for selection will be the novelty of the science, the relevance of its possible applications, the possibility for interactive experiences, and the potential to reach out to and excite young people.

For more information, contact Olga Stachova, Science Exhibition 2009 coordinator, MITACS, East Academic Annex, Room 120, Simon Fraser University, Burnaby, BC V5A 1S6; phone (604) 291-5477; e-mail ostachova@mitacs.ca.

ATASC Teachers Resource Sharing Database: Featured Resource

A trip to the Protected Members Area of the ATASC website (www.atasc.ab.ca/protected.htm) gives you the opportunity to explore our new Teachers Resource Sharing Database—an easy-to-use but powerful tool that allows science teachers to share resources with each other. And it is only available to members of the Science Council!

One interesting resource I've found through the database is Lareina Dibben's complete unit plan for the electricity topic in Grade 5. It notes curriculum connections and the number of classes required, and it includes a list of materials and lesson plans and day plans, complete with evaluation plans and guidelines. There are also masters for flash cards. This unit plan is a great tool that will save many teachers a lot of time in planning.

I hope you find it useful.

Wyland Ocean Challenge

The Wyland Ocean Challenge: "Clean Water for the 21st Century . . . and Beyond" is an art and science program that was introduced to science teachers at the annual conference of the US-based National Science Teachers Association in Anaheim, California, in April. The program has received excellent feedback from excited teachers of all grades and academic settings. The teacher involvement and the support of partners—including the Scripps Institution of Oceanography at the University of California, San Diego; the Birch Aquarium at Scripps; and the National Oceanic and Atmospheric Administration (NOAA)—have made the Wyland Ocean Challenge the most comprehensive art and science program to date.

For more information about the Wyland Ocean Challenge, visit www.wylandoceanchallenge.org.

Wyland Ocean Challenge
CLEAN WATER FOR THE 21ST CENTURY...AND BEYOND

Inside Education's Classroom Presentations: Electrifying and Wasteful?

A silver conical hat. A tin can. Slides showing a tire that's bigger than a house. A deck of cards. These are just some of the things Inside Education staff might arrive with if you book a no-cost energy or waste classroom presentation, available anywhere in Alberta.

A variety of activities are used throughout the 75-minute presentations to help students understand the science behind and the issues related to these topic areas.

Energy/Electricity

Curriculum Connections

- Grade 5 Science—Electricity and Magnetism, and Mechanisms Using Electricity
- Grade 9 Science—Electrical Principles and Technologies
- Grade 4 Social Studies—Alberta: A Sense of the Land
- Grade 5 Social Studies—Canada: Its Geography and People

Students will identify the various renewable and nonrenewable energy sources, determine how they use them in their lives, participate in mapping activities and generate ideas about how they can reduce their own energy consumption. Depending on the grade level and the learning styles of the students, the presentation may include a cross-Canada energy slideshow, a petroleum or electricity play, the game show *Petroleum Squares* or a readers' theatre–style Electro Report.

Waste

Curriculum Connections

- Grade 4 Science—Waste and Our World

The presentation will help students answer the following questions:

- How do I produce waste?
- Where does plant and animal waste go?
- What's the point of packaging?
- What do the 3 Rs mean for me?
- Why is some waste bad for me and the environment?
- What can I do to make less waste?

For more information, contact Inside Education at (780) 421-1497 (Edmonton) or (403) 263-7720 (Calgary), or visit www.insideeducation.ca/html/classroompres.html.

Book Reviews

As Nature Made Him: The Boy Who Was Raised as a Girl
by John Colapinto
HarperCollins Canada, 2000

For my Biology 30 course, I am always looking for interesting ways to introduce the endocrine and reproductive systems and to link curricular concepts to real life. I have found that a great way to pique the interest of students in this area is to review *As Nature Made Him: The Boy Who Was Raised as a Girl*, by John Colapinto, with them.

The book tells the fascinating true story of an identical twin boy born in 1965 in Winnipeg. After an unfortunate circumcision accident, which the author describes in gruesome detail, the boy was left without a penis. The book relates the difficult decision made by the boy's parents and doctors to raise baby Bruce Reimer as Brenda Reimer.

The author describes in detail the physical changes that Brenda/Bruce endured as a result of years of estrogen hormone therapy. The book includes a number of pictures that show the progression of Brenda/Bruce and the identical twin brother, Brian (who serves as the ideal control subject).

The book also addresses the emotional and mental anguish Brenda/Bruce experienced and highlights the controversial issue of gender identity.

At the age of 15, after being informed of her gender at birth, Brenda/Bruce altered the hormone therapy to testosterone, had a mastectomy and started living as David Reimer.

Following two phalloplasty surgeries, David eventually went on to get married. The book ends at that point. Sadly, David committed suicide in 2004 at the age of 38.

Rachel Toews

Canadian Women Invent!
by Annie Wood, with Fani Evagelou and Catherine Farquharson
Inventive Women Inc, 2001

When we are quizzed on famous inventors, our brains are programmed to rattle off names such as Alexander Graham Bell, Benjamin Franklin and Thomas Edison. But if the category turns to prominent women inventors—or, better yet, Canadian women inventors—how many of us can confidently buzz in before time is up?

That could soon change. *Canadian Women Invent!* is inspiring a new generation of school kids by exposing them to the marvellous achievements of little-known greats such as Alberta innovators Terry Allen and Indira Samarasekera.

On each page, classic inventions and new innovations are featured side by side, helping to emphasize that Canadian women have not only created products and systems that enrich our quality of life but also that there are still modern-day pioneers striving to make great breakthroughs. Through personal stories and photos depicting the faces of real women like our moms, sisters, teachers and neighbours, the inventors are portrayed as creative and passionate people who recognized a need and set out to develop a product to fulfill it.

Rounding out the book's content is a tip of the hat to American women inventors and the Canadian men who gave us important contributions such as the odometer, basketball and time zones.

Students using this book for research projects will be glad to discover that the chapters are indexed by province for easy reference. Each unique profile is presented in a conversational voice and peppered with useful facts. Add to this an attractive design, lively illustrations, and margins bursting with additional trivia and motivational quotations, and this book is sure to be a hit with tweens (8- to 12-year-olds).

The authors don't leave eager readers hanging, either. For students who find themselves revved up with ideas for inventions of their own, the chapter "Let's Invent!" spells out the process of product development, patenting and, finally, marketing.

Undoubtedly this book accomplishes what its authors intended: to reach today's young women, who may believe that being an inventor is an old-fashioned profession or that everything we need has already been invented. *Canadian Women Invent!* successfully demonstrates that we are only limited by our imaginations and that each one of us has the potential to become a mother of invention.

Barbara Chabai

Hi. My name is Diana, and I'm 11. I sat down and read *Canadian Women Invent!* because it looked very interesting. I never knew that women invented so many things that we use in everyday life! For example, the Jolly Jumper. That's right—a Canadian woman invented it. The board game Balderdash is also 100 per cent Canadian! This book not only shows you what the women of past and present invented but also leaves you with a lot of great information.

CWI! left me thinking that these women not only help themselves but also help other people, practically the entire planet. They made an impact, they changed the way things worked and they changed the world. Wow! And it's not just women on their own. There are some mother–daughter teams and some girls under 21 who won science fairs and are ready to use their ideas to change the world. In the back of the book, it shows *you* how to invent things and how *you* could change the world. So pick up this book and see how these women made history, or perhaps I should say *her*-story!

Diana Chabai

The Annotated Flatland: A Romance of Many Dimensions

by Edwin A Abbott, with an introduction and notes by Ian Stewart

HarperCollins Canada, 2001

I first read Edwin Abbott's *Flatland* when I was in high school. I don't recall how I came across the story, but its simplicity in covering a difficult topic captured me immediately. I've found myself returning to it several times over the years. I even quote it frequently in my classes.

I purchased this recent edition because of the notes added to it by Ian Stewart, who wrote a related book, *Flatterland: Like Flatland, Only More So* (Perseus, 2001). It is these notes that make this edition worthy of a place in any teacher's personal library.

The original book was first published in 1884. In it, the main character, aptly called A Square, describes his world. He lives in a two-dimensional world that he believes is the entirety of creation. He is a common man, as is signified by his four even sides. In this society, the more sides you have, the higher your standing. Women are simple lines and therefore have simple roles. Readers will quickly realize that Abbott is pointing out the faults of the Victorian society in which he lived.

However, the story is more than a satire; it also illustrates the meaning of dimension and provides a strong analogy to help us understand the fourth dimension. Mr Square encounters A Sphere from our universe, and through the experience we learn some interesting things.

This annotated version provides the reader with more background and information about the book. Stewart points out the connections to Victorian times. He also notes how Abbott uses precise mathematics in his descriptions of the characters and the worlds. Stewart also shows us where Abbott has made a few "mistakes."

Jumping from the story to the notes in the margins makes for difficult reading. I recommend that new readers simply read the story a few times to become familiar with it before tackling the notes. Then take the time to digest the wonderful tidbits found in the notes. I really enjoyed how the annotation filled out the universe of A Square.

Flatland is definitely a book I would like every math and physics student to read.

Derek Collins

Trails to Sustainability: An Environmental Education Conference

Delta Lodge at Kananaskis, Kananaskis

May 24–27, 2007

Registration is now open for this exciting conference, which is designed for all educators, whether teachers in a school or elsewhere. Come join us in the spectacular setting of the Kananaskis Valley. Picture yourself learning about and celebrating environmental education . . . in May . . . in the Rockies—it doesn't get any better!

This is a joint conference hosted by three organizations: the Canadian Network for Environmental Education and Communication (EECOM), the Alberta Council for Environmental Education (ACEE) and the Global Environmental and Outdoor Education Council (GEOEC) of the Alberta Teachers' Association.

This event will help you learn more about the many trails to environmental stewardship and a vibrant society and economy. Our keynote speakers reflect these three pillars of sustainability.

- *Environment.* Ecology professor David Schindler will help us examine our environmental impact and responsibilities through a lens of water, and wildlife biologist Karsten Heuer will demonstrate our connections to wildlife and wilderness.

- *Society.* Stephen Lewis, the UN secretary-general's special envoy for HIV/AIDS in Africa, will remind us what we can do to improve the human condition, in Canada and abroad.
- *Economy.* Hunter Lovins, president and founder of Natural Capitalism Solutions, will show us how schools, business and people profit and thrive when we "green" our practice.

The first 150 registrants will pay just $99, plus a mandatory fee of $35, which gives you a one-year membership in each of the three host organizations.

The first full day of the conference (Friday, May 25) has already been planned. You can register online for one of 19 trails—thematic full-day sessions designed to help you explore a topic close to your heart. We are currently accepting proposals for Saturday workshops. Please note that the deadline has been extended to **October 25.**

For more information, visit www.trailstosustainability.ca. From there you can register for the conference, choose a trail for Friday, arrange for accommodations and meals, and download the request for proposals.

Gareth Thomson,
Conference Cochair
and ACEE Executive Director

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