



groundWORK

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- Poster** From Northern Lights to Urban Trails
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Please share this newsletter with other teachers and librarians.

Thank You!

First of All

Welcome to the world of *Mining Matters*. Known for its solid support of Earth science learning at the Junior and Intermediate levels, *Mining Matters* now offers new resources to meet the needs of the high school curriculum. We invite those teaching Earth science to take advantage of these resources and to browse the various ideas and connections highlighted in this newsletter. Please use them, share them, and let us know what you think. If you have questions or suggestions, please get in touch. You'll find contact information on the back page of this publication.

Mining Matters Resources for YOU

Web Site

The *Mining Matters* Web site provides an in-depth look at the various resources we offer to those teaching Earth science. It also lists a number of links to useful Earth science Web sites.

Go to www.pdac.ca/miningmatters and click on *Teacher Info* or *Student Info*.

From Northern Lights to Urban Trails

Poster

Included with this newsletter, you'll find the very latest *Mining Matters* publication. Educators and designers from across the country came together with *Mining Matters* to illustrate anew how "mining makes it happen." *From Northern Lights to Urban Trails* highlights the exciting world of the snowmobile and the metals and minerals that go into it. The colourful two-sided poster puts information at your students' fingertips and teaches the crucial role of mined materials in everyday life. In hand or displayed on the wall, this resource will certainly attract students' attention!



silica COPPER GOLD diamonds titanium TIN MOLYBDENUM
 indium IRON IRIIDIUM zirconium ZINC lead YTTRIUM vanadium
 ALUMINUM boron chromium nickel TUNGSTEN oil & gas

NickelQuest: Virtual Mine Tour

DVD

Next on the list is *NickelQuest*, the Ontario Mining Association's virtual mine tour project for Grades 7 to 9. The video brings to the classroom the experience of touring an underground nickel mine in Sudbury. Created with attention to technical accuracy, this resource is the product of consultations with educators and advisors sharing a history of involvement in natural resources, Earth science, and mining education. Enjoy the film—popcorn not included!



In-Service Workshops

Mining Matters offers resource kits to Ontario teachers through a two-hour workshop that may be hosted by a school board or teacher organization. Workshops are structured to accommodate up to 30 teachers and can be scheduled anywhere in Ontario with a minimum of four weeks' notice, subject to availability. The board's curriculum coordinator, its designate, or the teacher organization must handle all organizational details for the workshop. These include

- Confirming the date and location of the workshop
- Determining the number of teachers to attend
- Handling all payments

Mining New Opportunities

The Ontario Mining Association (OMA) produced *Mining New Opportunities*, a 14-minute video/DVD intended to help First Nations residents better understand the mineral industry, and its employment and entrepreneurial opportunities. Created by Big Soul, an Aboriginal TV production house, the video/DVD is produced in five languages: Cree, Oji-Cree, Ojibwa, English, and French. The *Teacher's Resource and Speaker's Guide* contains 13 learning activities designed to build on the themes in the video/DVD.

The learning activities assist educators teaching youth in senior, intermediate, and junior grade levels. Explore the mining process, discover careers in the mining industry, create a venture plan for a new business, investigate how sustainable development applies to mining and unearth the importance of rocks, minerals, metals and mining in everyday life.

These resources are available to download from the following Web sites:

www.oma.on.ca/education/miningvideo.asp

www.oma.on.ca/education/teachersguide.asp

Diamonds: A Teacher's Best Friend

In 2006, *Mining Matters* unveiled **Discovering Diamonds**, a comprehensive secondary Earth science lesson kit—our first teaching resource dedicated particularly to the high school curriculum.

Discovering Diamonds is a one-of-a-kind resource designed to bring the rich knowledge of Canadian diamonds into high school classrooms across Canada. The goal of this resource is to use diamonds as an integrating theme through which to study the concepts expected in senior level Earth science and geography courses. Learning activities have been designed to illustrate real-world experience with diamonds—not just theories and concepts.

The 21 activities in **Discovering Diamonds** bring in elements from every area of Earth science—from earthquakes to environment, cratons to chemicals. Activities are presented in sequence in five topics, starting with the large-scale structure of the Earth, moving into tectonic and surficial processes, and finishing with a look at the mining industry, including exploration, mining, processing, and its importance to Canadians. This sequence also represents a general progression in time: from the formation of the Earth, through the creation of our present-day landscape, to the modern industry and its impact on humans.

Students will learn about Canada's world-class diamond-bearing deposits, diamond formation, and the modern technology being applied to the discovery, extraction, and processing of diamonds.



The diamond industry uses cutting-edge technology; current information about it makes a valuable addition to the school Earth science curriculum.

As much as possible, authentic data and materials, generously provided by members of the diamond industry, have been used to create the activities. Maps, images, data, fact sheets and presentation required for the resource are provided on two CD-ROMs. Additional resources include a specimen of kimberlite, the book *Canada's Northern Diamonds: from rocks to riches*, posters, and the *Diavik: Constructing the Legacy* DVD.

Discovering Diamonds provides a unique and relevant resource to communicate Earth science concepts, and offers students opportunities for experiential learning and scientific investigation.

2010 Connection: The Inuksuk

Once simply an Inuit tool to mark a significant event or place in the North, the Inuksuk has become a symbol of leadership, cooperation, and the human spirit.

A contemporary rendition of the Inuksuk is now the emblem of the Vancouver 2010 Olympic Winter Games.

The Inuksuk, meaning "to act in the capacity of a human" in the Inuit language Inuktitut, is built to resemble the shape of a person with arms stretching out. Each Inuksuk is unique, its shape determined by the stones at hand.

The Inuksuk is a form of Inusugait, the term used for all forms of piled stones. Inuksuit (plural of Inuksuk) mark where a significant event happened and also help in the hunt of caribou herds. Other kinds of Inusugait show travellers and hunters the way home, warn of dangerous places, and indicate where food is stored.

Just as the Inuksuk acts in the capacity of a human in the Inuit world, this friendly rock structure extends open arms to the world in Canada's name.



From the time she was in kindergarten, Eira Thomas often accompanied her father, a mining engineer, into the field. So, it was no surprise when, in 1991, with her B.Sc. in Geology in hand, she went to work for her father at Aber Resources in Vancouver, B.C. Just three years later, Eira led the team that discovered a 2.5 carat diamond in the Lac de Gras region of the Northwest Territories, marking the beginning of today's successful Diavik Diamond Mine. She worked as a geologist with Aber Resources Ltd. (now Aber Diamond Corporation) for five years, took on the role of Vice-President Exploration in 1997, then served as director from 1998 to 2006. Today, Eira Thomas is President and CEO of Stornoway Diamonds Corporation, a company she founded with Catherine McLeod-Seltzer in 2003.

Catherine McLeod-Seltzer had family background in mining, but leaned toward the financial side of the industry. She studied for a business degree, then worked for Yorkton Securities, concentrating on Latin American mining opportunities. She went on to co-found gold-focused Arequipa Resources, which was bought out by Barrick Gold Corporation in 1996 for \$1.1 billion. Catherine then took on co-management of the Pacific Rim Mining Corporation, focusing on exploration for precious metal deposits in Central and South America. In 2003, Catherine brought her financial expertise and enthusiasm for mining to the formation of Stornoway Diamonds, a company aiming to position itself as Canada's premier, growth-oriented diamond exploration and development company.

Pamela Strand is another firm believer in Canada's potential as a major diamond producer. With a B.Sc. in Geology from the University of Toronto and an M.Sc. from the University of Western Ontario, she headed to Yellowknife to work as a district geologist for the federal government. She was there when diamond frenzy hit the region in 1991 and got her first taste for diamond exploration. Later, when Pamela moved to Edmonton, she formed Shear Minerals Ltd.; since then the company has acquired mineral rights to extensive properties in the Northwest Territories, Nunavut, and Alberta. The company's Churchill Diamond Project in Nunavut attracted the attention of Stornoway Diamonds and BHP Billiton and, with their backing, is in the race to become yet another lucrative diamond mine in Canada.

While women do not figure prominently among today's crop of mining executives, Eira Thomas, Catherine McLeod-Seltzer, and Pamela Strand do their best to lead the way. And with increasing numbers of women graduating from Earth science studies these days, there may well be many following in their footsteps.

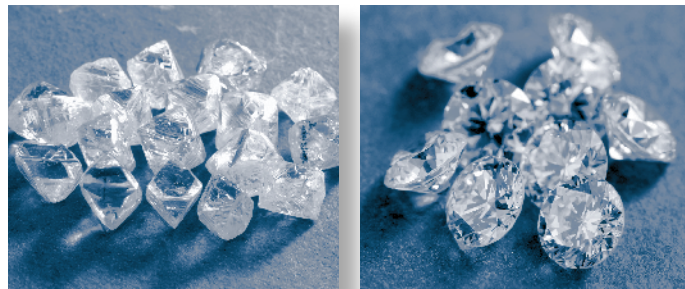


Photo Credit: BHP Billiton Diamonds Inc.

Diamond Girls

Most women have a fondness for diamonds, and these days, they don't necessarily wait around for their partners to give them these sparklers. A trip to a jeweller will usually do the trick, but three Canadian women took their love of this mineral straight to the source. By following their hearts into geological realms, Eira Thomas, Catherine McLeod-Seltzer, and Pamela Strand have emerged as driving forces behind Canada's growing diamond mining industry.

Science for the Gaming Generation

Give your students the opportunity to rediscover science in a 3D setting with the EXTREME VR Science Project. An EXTREME team will help students develop a scientific or engineering-related question in a subject they want to better understand. It will seek out both scientific and technological mentors to help students develop their questions into an interactive presentation.

Students will have fun learning new open-source 3D software as they explore scientific problems. The goal is to introduce students to, and support their understanding of, new and exciting technological programs that will impact the future of research. Students can also explore careers in engineering, science, and information technology.

Led by MIRARCO—a not-for-profit research and development company owned by Laurentian University, specializing in the natural resources industry, energy, and the environment—this initiative is supported by the Ontario government and Youth Science and Technology Outreach Program (YSTOP), with partners including Science Timmins, Laurentian University, and *Mining Matters*.

This year, Alexandre Harvey, a 16-year-old student from New Liskeard, won the EXTREME VR Science Fair. He used 3D modelling software to show how wood-waste can be treated using wetlands instead of expensive and inefficient water treatment centres. A 3D environment helped him to better visualize a design for a wood-waste treatment plant. As the first-prize winner, Alexandre received a cash prize from Science Timmins and the opportunity to travel to Toronto to present his research at the Ontario Research and Education Summit, a gathering attended by some of the top researchers in Canada.

The EXTREME VR project will expand beyond Northeastern Ontario to include Sudbury in fall 2007. The Sudbury project is open to participants from all four school boards. Final presentations will be hosted at Laurentian University's state-of-the-art 3D laboratory. Students will be eligible for prizes, work experiences, and more!

For more information, contact David Kurt, EXTREME VR Assistant Coordinator at 705-675-1151 ext. 5099 or dkurt@mirarco.org, or go to <http://extremevr.mirarco.org>

Careers in Mining

According to a 2005 Mining Industry Training and Adjustment Council (MITAC) report, the mining industry in Canada needs 81,000 new, skilled employees to enter the field over the next decade.

With that in mind, take a look at some of the resources available to students interested in pursuing post-secondary learning in the array of fields related to the mineral resources industry.

Explore for More

Explore for More, a collection of career information products developed by the Mining Industry Human Resource (MiHR) council, showcases careers in the mining industry.



One product is a bilingual Web site full of information on the mining industry and related careers. This attractive, easy-to-navigate Web site dispels outdated perceptions about mining and highlights Canada's relationship with the industry. Students can search for Canadian training and educational programs and find links to employer Web sites and job banks. Testimonials and profiles of people in a variety of mining-related jobs serve to put a face on the industry. *The Explore for More* Web site is a comprehensive resource well worth the visit.

Go to www.acareerinmining.ca.

Rock ON

The Northern Ontario Business/Sudbury Mining Solutions' has produced a new magazine that highlights careers in mining. Intended as a resource for Grade 10 career courses, *Rock ON: Career opportunities in Ontario's mining industry* allows mining industry employees to share their passion for their chosen field of work. Twenty ambassadors of the industry—prospectors, geologists, miners, mechanics, and engineers—recount first-hand impressions and personal experiences to students.

Rock ON will also be offering three \$1,000 scholarships to students interested in pursuing a career in the mining sector. Copies of the magazine are being distributed to high schools in Northern Ontario and are available to guidance counsellors elsewhere in Ontario. The content of the publication—in English and French—along with scholarship application forms are available at the *Rock ON* Web site.

Go to www.rock-on.ca

Improved University Facilities

Many of Canada's post-secondary institutions offer courses related to mining, metallurgy, engineering, and Earth and Environmental sciences. Some are upgrading their faculties to meet the demand for graduates in these fields. Here are two examples:

- In May 2007, the B.C. government contributed \$7.5 million to the University of B.C. to expand its Norman B. Keevil Institute of Mining Engineering, matching a donation by mining firm Teck Cominco Ltd. The money will be dedicated to improving infrastructure and creating spaces for more students.
- In September 2007, Kinross Gold Corporation committed \$500,000 over the next five years to Queen's University in Ontario, to establish the Kinross Professorship in Mining and Sustainability, a teaching and research program.

Field Trip Subsidies

Mining Matters offers a Field Trip Subsidy Program to enrich Earth science learning. Teachers who have completed an in-service workshop and use a *Mining Matters* resource kit are eligible to apply for the field trip subsidy. The program currently has a \$2,500 budget for high school applications. *Mining Matters* will provide five \$500 subsidies to help offset field trip travel costs to stone, sand and gravel, mining, and geoscience venues. Applications will be considered on a first-come, first-served basis. Teachers and students are asked to submit a summary of their experiences. Please go to the *Mining Matters* Web site for application forms.

ROM Renaissance

If you're able to go to the Royal Ontario Museum (ROM) in Toronto, it's definitely worth the visit. The revitalized ROM promises to help convey the excitement of studying Earth science.

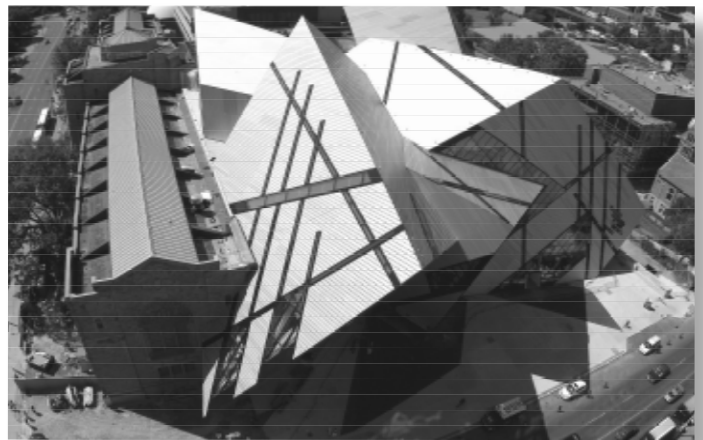
Officially opened in June 2007, the new Michael Lee-Chin Crystal, named after Portland Holdings Inc. Chairman Michael Lee-Chin in appreciation of his \$30 million gift, presents a dynamic building design inspired by the museum's renowned gem and mineral collection. The five interlocking, self-supporting prismatic structures pierce the space around the older structure, challenging conventional ideas of architecture. Noted for its engineering complexity and innovative methods, the addition also underlines the use of mined building materials: roughly 3,500 tonnes of steel and 9,000 cubic metres of concrete went into the construction.

On the inside, a \$10 million donation from Teck Cominco Limited is transforming the presentation of the ROM's extensive Earth science collection. This generous gift will establish the Teck Cominco Suite of Earth Sciences Galleries, the Teck Cominco Endowed Chair in Mineralogy and the Teck Cominco Digital Education Module in Earth Sciences, as well as create a new home for the Canadian Mining Hall of Fame at the museum.

"We will build three unique galleries within the Teck Cominco Suite, doubling the volume of ROM minerals and gems on display and opening up virtually limitless avenues for education," explained William Thorsell, the ROM's Director and CEO, in a press release earlier this year. "Our collections will be beautifully displayed in a restored space, showcasing everything from precious gems to meteorites to spectacular crystalline gold. With this donation, we not only meet our objectives for Earth sciences but also expand our scope, establishing a great future for education and research through a new endowed chair, by digitizing our collection, and by bringing the history of Canadian mining to the museum." The galleries are due to open in 2008.



*View from the northwest of the Michael Lee-Chin Crystal.
Image courtesy of the Royal Ontario Museum © 2007*



*Aerial view of the Michael Lee-Chin Crystal.
Image courtesy of the Royal Ontario Museum © 2007*

In the meantime, teachers can take advantage of the ROM field trip, described below, designed to fit the Ontario Earth science curriculum.

Earth Materials Grades 9 to 12

By seeing and handling a large variety of specimens, students learn to describe how the three major types of rock are formed, to distinguish between rocks and minerals, and to conduct tests to examine their properties. Students review the use of rocks and minerals in our everyday lives.

ROM Club

Do you have students with a passion for rock, coin, or fossil collecting? They might want to look at the Collector's Circle, for ages 11 to 14. Participants join in gallery investigations that will have them prospecting for additions to the ROM's precious gem collections, appraising an ancient coin collection, or identifying some bizarre fossil finds.

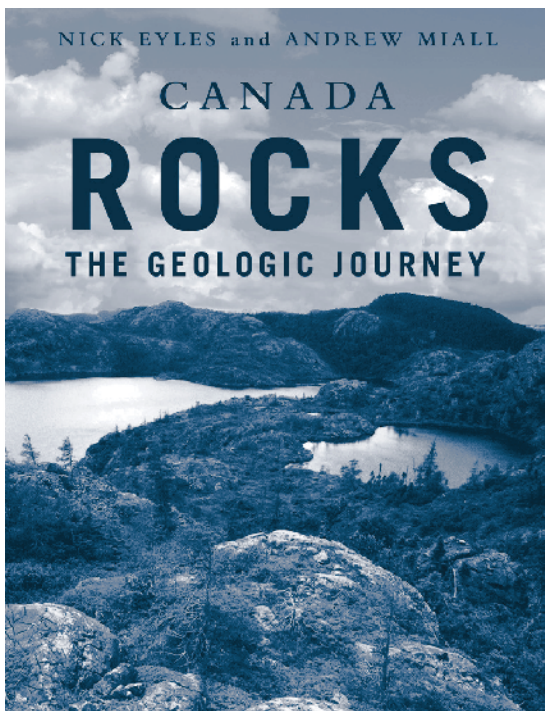
For details, go to www.rom.on.ca/schools/index.php

Hot off the Press

Canada Rocks: The Geologic Journey

Anyone teaching Earth science will appreciate the marvellous Canadian geological portrait painted in *Canada Rocks: The Geologic Journey*, a new book by Nick Eyles and Andrew Miall, Professors of Geology at the University of Toronto. Photographs, charts, maps, graphs, and sketches complement the authors' chronicle of the eons that gave shape to continents, mountains, and oceans and created the world's second largest country—Canada. The book explores our country's expanse, examining its history through modern-day sites and ancient land shapes, including

- Rocks in Point Pleasant Park in Halifax that once were part of Morocco
- Canada's Arctic regions that formerly joined what today is Siberia
- Greenland as a former part of Labrador
- Fossils in British Columbia's interior that lived in a sea covering China



An excellent reference for anyone fascinated with the geological forces that created our country, this resource also includes site locations to visit for close-up study.

Nick Eyles' previous books include *Ontario Rocks: Three Billion Years of Environmental Change* and *Toronto Rocks: the Geological Legacy of the Toronto Region*. Both Nick Eyles and Andrew Miall have written many leading scientific papers.

CBC Documentary: Geologic Journey

Once upon a time, North America and Africa belonged to one super-continent, mountains rose above the Great Lakes region, and ice that was several kilometres thick once blanketed much of the country. Hard to imagine? CBC now offers us *Geologic Journey*, a series that reveals the amazing geologic processes that occurred over 4.5 billion years to create Canada's modern-day landmass.

Inspired by hikes around the Niagara Escarpment, Michael Allder, executive producer of the Canadian documentary series *The Nature of Things with David Suzuki*, launched the four-year project that resulted in *Geologic Journey*. The five episodes travel through time as they explore the Great Lakes, the Rockies, the Canadian Shield, the Appalachians, and the Atlantic Coast. Shot in high definition, the series blends state-of-the-art science and visual techniques with personal stories from people fascinated by geology. Nick Eyles, Professor of Geology at the University of Toronto, served as principal scientific advisor to the series.

The complete series is available in a two-disc collector's edition on DVD, including French language versions and special features not seen on television.

A special learning edition, accompanied by a 60-page Teacher Resource Guide written by practicing Canadian educators, complements high school curriculum. The guide provides classroom-ready, reproducible activities that link to curriculum in science, environmental science, and geography courses at the Grade 10 to 12 levels. Each of the five sections provides an introduction, teacher background information, curriculum objectives, student activities, suggestions for assessment, and extension activities. Curriculum connections include such key concepts as plate tectonics, mountain building, erosion, and the relationships between the physical and human environments.

*Additional visual materials are available via links to the CBC Web site at www.cbc.ca/geologic
To order, call 1-866-999-3072 or
e-mail cbclearning@cbc.ca*

Rock Fun!

Different cultures have been balancing rocks for thousands of years. In 1998, Canadian entrepreneur Malcolm Bisiker decided to take the activity into the realm of entertainment after watching friends endlessly occupied with balancing sugar cubes. He developed *ruk•shuk: The Game of Rock Balancing*, a game in which players race against the clock to build rock formations modelled after natural rock phenomena from around the planet. In November 2006, Canadian Living magazine recommended *ruk•shuk: The Game of Rock Balancing* as its number one holiday gift suggestion for teenagers, and the Neighborhood Toy Stores of Canada named the game to its "2006 Latest & Greatest Toys" list. For more information, visit www.rukshuk.com.



The Canadian National Committee's IYPE theme will be *WHERE on Earth? WHERE in Canada?* The acronym WHERE stands for Water, Hazards, Energy, Resources, and the Environment. Projects will feature these five key Earth science themes, directed towards three main goals.

- **Outreach:** Increase public awareness of the broad scope of Earth science, with special emphasis directed towards youth, encouraging them to consider pursuing a career in Earth science.
- **Industry Image:** Demonstrate that Canada's resource extraction industry follows clean, environmentally responsible practices.
- **Geoscience Research:** Identify mechanisms for funding programs of research excellence in Earth science.

Further information about the International Year of Planet Earth can be found at these Web sites:

www.iypecanada.org/index.php

www.esfs.org/index.htm

www.iugs.org

International Year of Planet Earth

In 2005, the General Assembly of the United Nations proclaimed 2008 as the International Year of Planet Earth (IYPE).



IYPE celebrants will demonstrate ways in which Earth sciences can help future generations meet the challenges involved in ensuring a safer and more prosperous world.

Canada will be a major participant in the IYPE, in conjunction with the International Union of Geological Sciences (IUGS), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and more than 60 countries worldwide.

Canada's resource extraction of major petroleum, coal, metal, mineral, and water resources accounts for the largest component of the national Gross Domestic Product (GDP). This ratio represents one of the highest among the industrialized nations. At the same time, Canada's Earth scientists demonstrate environmental stewardship, exploring and developing responsibly, and conducting leading edge research on geohazards, climate change, palaeontology, and other important Earth issues.

Earth Learning Ideas

Take advantage of Earth-related teaching ideas offered every week during the International Year of Planet Earth, 2008. Using minimal resources, these ideas should help develop scientific understanding and thinking skills. Each one will encourage discussion through a blog to develop a global network of those interested in Earth science education. Two activities related to volcanoes and earthquakes have already been posted: Tiltmeter and Quake Shake.

To access this resource, go to:

www.earthlearningidea.com

Provide feedback on:

<http://earthlearningidea.blogspot.com>

To sign up or learn more, e-mail:

info@earthlearningidea.com

Beautiful Geology

Ottawa area residents and visitors can get a close-up view of some of Canada's stunning natural art. Until January 6, 2008, Ottawa's Canadian Museum of Nature presents *On the Labrador*, a display of 30 spectacular large-format geology-based photographs of Labrador, shot by northern Quebec photographer Arnold Zageris. The photograph subjects ranges from the grandeur of Lake Tasisuak down to the detail of the minerals in the ancient mountain rock.

To take a look at some sample photos, go to http://nature.ca/exhibits/exs/labrador/index_e.cfm



Photo Credit: Arnold Zageris

Reflections of a Monolith

On an unusual windless day in Labrador this fractured rock brought out the clarity and colour of the water in Lake Tasisuak, a lake close to Nain, Labrador. This boulder fell from a high cliff not too long ago (geologically speaking). The remaining scar from where it came from high above on the cliff wall was still bright and fresh.

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Mining Matters creates exceptional educational resources to meet provincial Earth science curriculum expectations. Since 1994, this charitable organization has reached more than 400,000 teachers and students through resources that promote awareness of the importance of rocks, minerals, metals, mining, and Canada's geology. *Mining Matters* prides itself on building long-term partnerships with teachers by providing relevant, accurate, and authentic Earth science resources for the classroom, designed by teachers for teachers.

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