

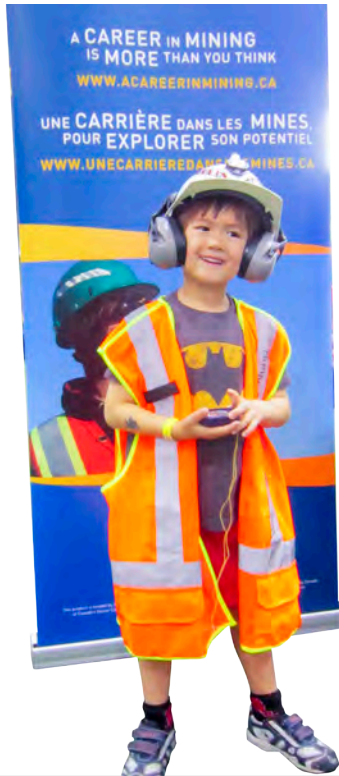


Mining Matters Annual Newsletter

2016



Message from the President and CEO



600,000

teachers, students and members of the public reached since **Mining Matters** inception in 1994

As I write my annual letter, I realize how quickly time has passed. It has been a year with many rewarding moments and “firsts” of which I am proud. This year **Mining Matters** has made solid progress on many fronts. We have formed new partnerships; STEM Camp, Indigenous and Northern Affairs Canada and the Government of Northwest Territories and delivered more Teacher Training and *Mining Rocks* Programs than ever. Our newest publication, *Medicine: From the Ground Up*, highlights the emerging and important role of minerals to health care and wellness, further building awareness of our industry in evolving times.

We have also made changes to our senior leadership team this year, positioning our organization for continued growth and the ability to balance industry challenges with our ongoing need to build awareness of the important role of rocks and minerals in our society. I am excited to announce the appointment of Laura Clinton as Executive Director. Laura brings a depth of experience, knowledge and relationships in education and the minerals industry which will lead us forward in an innovative and creative fashion consistent with our changing environment. I am also pleased that Lesley Hymers joined **Mining Matters** as Manager, Education and Outreach Programs. Lesley is no stranger to **Mining Matters** and has been a significant partner in our education and outreach programs contributing her knowledge and expertise to many key initiatives, including the PDAC Convention programs and WHERE Challenge. Janice Williams, who has been with the organization for six years as Manager of Teacher Training and School Programs, will continue to provide her expertise and strong contribution to our educational initiatives as a consultant.

As a charitable organization, we rely on the support of our donors and sponsors in order to develop and implement our programs. I want to thank our returning donors and sponsors who have loyally supported us during these times of economic challenge in the industry and warmly welcome those who have joined us for the first time. Your unwavering commitment is greatly appreciated and helps support **Mining Matters** mandate to broaden students’ understanding of Earth science and the vital role rocks, minerals, metals and mining play in everyday life and increase awareness of the many career opportunities in the minerals industry.

I hope you enjoy reading about our many accomplishments and interactions across Canada this year, as we build awareness about our great industry and Canada’s natural resource treasures. We encourage you to share this year’s newsletter with others, along with the importance of minerals education.

Patricia Dillon
President and CEO

33 Mining Rocks
Earth Science
Programs
delivered to
2,106
youth participants

697 Educators trained
on **Mining Matters**
curriculum resources

16,940

Total number of individuals who enjoyed Earth science outreach activities at schools, camps, conventions, conferences and public events across Canada igniting interest about the wonders of Canadian geology

RECORD BREAKING WHERE Challenge

17 TEACHERS 460 STUDENTS

284

ENTRIES

inspired to creatively answer
“What on Earth is in their stuff?”
“Where on Earth does it come from?”

Who We Are

Mining Matters is a charitable organization dedicated to bringing knowledge and awareness about Canada's geology and mineral resources to students, educators and the public. The organization provides current information about rocks, minerals, metals, mining and the diverse career opportunities available in the minerals industry. **Mining Matters** offers exceptional educational resources that meet provincial curriculum expectations, created by educators and Earth science experts.

Mining Matters has reached an estimated 600,000 teachers, students and members of the public since inception in 1994.

Our mandate at **Mining Matters** is to broaden students' understanding of Earth science and the vital role rocks, minerals, metals and mining play in everyday life and increase awareness of the many career opportunities in the minerals industry.

Our mandate is delivered through three core educational initiatives:

Teacher Training and School Programs

Bringing Earth science to life for students and teachers in classrooms across Canada

Indigenous Communities Education and Outreach Programs

Opening a world of opportunities to youth in Indigenous communities

Outreach Programs

Developing an awareness of the mining industry and sparking interest in Earth science learning in people of all ages



Board of Directors

Mining Matters is a charitable organization governed by a volunteer Board of Directors.

Carol Burns, Aird & Berlis LLP

Patricia Dillon, Mining Matters

John Heslop, Mining Matters

Lee Hodgkinson, KPMG

Maureen Jensen, Ontario Securities Commission

William Roscoe, RPA Inc.

Edward G. Thompson, E.G. Thompson Mining Consultants Inc.

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Making Change Happen

Recently we had the pleasure of sitting with Dr. James Gill, a passionate advocate for education and a valued supporter of **Mining Matters**. He shared with us his thoughts on the need to support mineral resource education and his philosophy around philanthropic giving. Through his generosity to **Mining Matters** Teacher Training and School Programs, he has made a significant contribution to how **Mining Matters** reaches out to teachers and students. Thanks to Jim and his ongoing support we have expanded our number of Teacher Training workshops, presentations and school programs by 63% in 2016!

Like most leaders in the mining industry Jim has strong views on the role and obligation of the mining industry to support education among Canadian youth, coupled with a strong commitment and personal passion to making it happen. A dedicated supporter of geoscience, he believes education creates a net benefit to society and focusing on the elementary school level is the most effective place to start.

He stated, with a warm smile - *“Look around this room, does mining affect your life? The products of mining impact virtually every aspect of our daily lives and we need to get that message out clearly to people starting at an early age! Mining Matters does just that, educating children in an instructional, fun, hands-on fashion. That is the best way to do it.”*

Jim talked about his personal philanthropic philosophy; a model of focused giving which builds long term value for a cause. His giving principles are simple and effective: give larger amounts and make it material enough in size to accomplish organizational goals. In his opinion, many donors give small amounts to multiple recipients which makes it more difficult to have a significant impact on longer term goals. His preference is to support fewer projects with tangible objectives that can be accomplished within a realistic time frame; providing enough money to take those goals to fruition. He expects to see results from his charitable giving and wants to see the impact during his lifetime. As Jim says *“Why wait to donate until you are dead?”*

He believes the mineral industry in general does a poor job of promoting mining’s benefits to society. Media and industry communications, more often than not, focus on problems instead of emphasizing the positive and improving the understanding of our industry. Too often the conversation is about the negative environmental contributions of mining, not the applications and benefits and the importance to individuals. Mining as an industry is changing; there are more community impacts to be considered than ever before. Today we need more education on and recognition of the substantial benefits of the industry to all communities.

Mining Matters recognizes this perception gap and promotes the importance of the industry to all. Jim feels it is very important to fund elementary schools programs if we wish to improve students’ awareness and interest in science before they reach high school and university. Reaching out to younger students is important; they are very open to learning and curious about all aspects of life. Teacher involvement is critical to this learning experience as they will educate new young students each and every year.

The minerals industry is part of Jim’s family heritage. His grandfather, Dr. James Edward Gill, was a renowned geologist, explorer, scientist and teacher and Jim has carried forward that passion for exploration and mine development, with decades of significant accomplishments and experience in exploration, mine development and operations principally as founder and CEO of Aur Resources Inc. for 26 years.

When asked about a life lesson learned during his career, Jim shared a story from his days as part of the Andacolla Mining Project in Chile. Prior to mine development, the small town of Andacollo was very poor, had high unemployment, a shortage of quality medical care and education and very poor levels of social infrastructure. Each year Aur Resources held a big Christmas party in La Serena, a city on the coast about a one hour drive from Andacollo. The party had fine food, live music and dancing for all employees and their spouses. Transportation to La Serena and back was provided for all. For the first year or two attendance was surprisingly low given that this was considered one of the big events of the year. In subsequent years attendance increased to full participation. What Jim came to realize was that the low initial

attendance was not due to lack of interest but due to the lack of financial resources to allow the families to afford to dress in a manner which made them proud of themselves and their community, a situation which corrected itself as their employment at the mine raised their standard of living. The lesson learned was that people at every level in every community need to have pride in their work and in themselves. When a company invests in resource projects the people are its biggest resource. You don’t just put people to work; you also must respect them and their families and support their long-term wellbeing as well as that of their communities. Today Jim is amazed at what was accomplished at Andacollo where second generation people from the town of Andacollo are now part of the operating team. The mine, the employees and the community have all worked together and have benefited greatly from this team effort.

His final message to **Mining Matters** and our readers was simple - *“Keep up the good work. Our industry deserves to be well understood by the public. Engaging everyone’s support for our objectives is the only way to create a positive market understanding of the mineral resource industry amongst the greater part of the population. The best way forward is to engage our school teachers in the process and educate young people about this fine industry.”* He asks that you join him in that journey and vision of long-term investment.



“Our industry deserves to be well understood by the public.”

Events



KPMG's Community Leadership in Action

KPMG is committed to actively partnering with and contributing to their local communities and organizations in order to create positive change. In June, members of KPMG's Mining Practice and clients hit the field for the 8th annual KPMG Mining Soccer Tournament.

More than 100 mining industry professionals along with KPMG employees set forth to battle it out for the coveted KPMG Mining Soccer Cup as well as a year of bragging rights. Although the competition was fierce, Kinross took the cup home for the fifth time.

Teams played in support of **Mining Matters** as well as Second Kicks, with \$10,500 being raised in support of **Mining Matters**.

Mining Matters is grateful to all for their participation and sends special thanks to Lee Hodgkinson, Partner and National Industry Leader, Mining and KPMG for hosting and organizing this wonderful event.

Thank you KPMG for using your collective experience, skills and energy to drive positive change. Mining makes a difference!

Industry Hockey Fans Hit the Ice

Now in its 9th year, the **Mining Matters Hockey Tournament** is an industry favourite for competitive play on the ice and networking, in advance of the PDAC Convention in Toronto. This year twelve teams made up of various industry partners and clients, including the Mighty Miners "misfits" team of individual players, participated. One lucky participant had the chance to win \$10,000 in our signature Shoot for Loot Challenge and tickets to a Toronto Maple Leafs game were a hot raffle item. The competition was heated and the scoreboard was lit up each game! Congratulations to this year's champions, Kirkland Lake Gold!

Mining Matters thanks Irwin Lowy LLP, our Presenting Sponsor, as well as our many other sponsors and donors for making this year's tournament a success. We also thank Caracle Creek, founding tournament sponsor and sponsor of the Cup, for their vision and support of **Mining Matters** since 2007.

Next year we will be celebrating the 10th anniversary of the Hockey Tournament. Prepare to hit the ice on Saturday, March 4, 2017!



Celebrating the 10th Annual Diamond in the Rough Golf Classic

This year we celebrated the 10th anniversary of the **Mining Matters Diamond in the Rough Golf Classic**. To commemorate this milestone, we held the *Classic* at the beautiful Cedar Brae Golf Club, located within the scenic Rouge River Valley. Golfers and guests enjoyed the newly renovated golf course and club house. The weather was warm and the atmosphere was full of competitive energy!

Golfers had a fantastic day of play and networking, with new event features and prizes, exciting course contests,

a delicious post-game dinner and an evening highlighted by a silent auction of unique items. Congratulations to our first-place foursome, once again from Canadian Resources Insurance Solutions!

Mining Matters would like to thank our Diamond Sponsor IBK Capital Corp. for their continued support, as well as our many other sponsors and participants.



Rock Cycle Ride

The 5th Annual *Rock Cycle Ride for Minerals Education* took place on June 16, 2016 at Cedar Brae Golf Club in Scarborough, Ontario, in conjunction with our *Diamond in the Rough Golf Classic*. This event is perfect for those who prefer cycling over golf, but still want to join their colleagues for an evening of networking and a fabulous dinner.

Riders conquered either a 40-km or 80-km tour through the Rouge Valley, returning in the early evening for a cocktail reception, silent auction, dinner and prizes. Thank you to our Presenting Sponsor RPA and all of our riders!



For more information please contact Laura Anonen, Tournament Coordinator, at tournaments@miningmatters.ca.

Sponsors Fuel Enthusiasm for Education and Outreach Programs

At **Mining Matters**, we are enthusiastic about our education and outreach program; *Mining Rocks* Earth Science. We share that enthusiasm in urban, rural and remote communities providing resources and inspiration in mineral resources education.

However, even with all the enthusiasm in the world, we couldn't do it without funding. We are extremely grateful to our generous sponsors for making education happen!

This is how we do it:

- **Involve youth** in Earth science and the mining and mineral exploration industries through meaningful learning activities and innovative education programs.
- **Provide engaging** hands-on mineral resources programming and practical mining educational opportunities for youth living in Indigenous communities.
- **Equip teachers** with curriculum-linked classroom resources and offer professional development training to effectively teach curricula related to mineral resources, exploration, mining and Earth science.
- **Inform youth** about career opportunities in mining and mineral exploration industries.



Baffinland Iron Mines Corporation sponsored six two-day programs, including teacher workshops, across Baffin Island. In addition to core activities, we added customized activities, including a Mary River Topographic Map exercise.

Confederation College and Lakehead University sponsored two four-day programs in partnership with Outland Camps to deliver *Mining Rocks* Earth Science Programs to youth attending the First Nations Natural Resources Youth Employment Program. The topics covered included a focus on careers.

Goldcorp sponsored programs, including community nights and teacher training in the Cree Nation of Wemindji, North Caribou Lake First Nation, Red Lake and Chapleau. In all locations, career mentors from Goldcorp shared first-hand mining experiences. During National Aboriginal Day, we partnered with

Goldcorp Porcupine Gold Mines in Timmins to deliver hands-on activities during celebrations.

New Gold sponsored successful programs in three communities: Whitefish Bay First Nation, Barwick and Fort Frances. Representatives from New Gold were present as mentors for the youth at each program.

Stornoway Diamond Corporation sponsored four half-day programs in the Cree Nation of Mistissini to reach 68 participants in grades 7 and 8. Stornoway representatives delivered presentations about career paths, experiences with the Renard Project and career possibilities for youth.

Thank you sponsors, for fueling our enthusiasm and that of our program recipients. Everyone benefits when mining matters!

Grant from Indigenous and Northern Affairs Canada

This past year, **Indigenous and Northern Affairs Canada (INAC)** gave **Mining Matters** \$75,000 to deliver educational programming. We exceeded the project deliverables, with 17 *Mining Rocks* Earth Science Programs, five teacher workshops and 10 community engagement events. In all, we reached 1,130 participants.

This funding allowed us to engage new audiences, including four Southern Ontario First Nation communities: Mississaugas of the New Credit First Nation, Hiawatha First Nation, Curve Lake First Nation and Nipissing First Nation. Participants, ages six and up, enjoyed a fun-filled day of Earth science learning. We are delighted to have been invited back to all four communities.

INAC recently announced that funding for our *Mining Rocks* Earth Science Programs will double in 2016-2017. This tremendous support will allow us to exceed last year's deliverables and develop six new hands-on activities related to environmental actions through the mineral resource development cycle.

We are grateful for the significant commitment of INAC and the confidence they have placed in our ability to raise young people's awareness of the Canadian mining industry and the role it plays in everyday lives.



Summer Jobs Pave the Way

Each summer, **Mining Matters** hires university students to assist in the delivery of Earth science programs to communities across Canada and work with industry partners to produce our Resource Kits for teachers. They act as ambassadors for Earth science education and provide role models for the young people they encounter. For many, this is their first job in the minerals industry, providing valuable work experience as well as real life lessons that leave lasting impressions. We are proud to be able to encourage and inspire our next generation of geoscience professionals. Here are just a few of their thoughts:

2001 – 2003 I feel lucky to have worked with Mining Matters, an organization passionate about supporting and developing youth. I am grateful to have learned about the fundamentals of project management during those undergraduate summers.

Kathryn Lee, MLIS, Media Asset Management Coordinator, CBC

2004 My position at Mining Matters allowed me to gain valuable experience working alongside industry professionals whose advice and teachings proved instrumental in getting me my start in mining.

Pierre Landry, P.Geo, Corporate Geologist – Evaluations and Development, Centerra Gold

2008 Mining Matters kicked off my career, gave me valuable work experience and introduced me to some of the most influential individuals in the minerals industry. Patricia Dillon was a tremendous mentor—she inspired me to aim for success in my career as a Geologist.

Ramona Verma, Geologist, Vale

2014 Working with community engagement workers within the mining sector opened my mind to the possibilities within the mining field outside of exploration and extraction, as well as the importance of relationship building.

Sarah Connolly, Program Officer and Risk Management Specialist for the PLAY West Program, Right To Play

2015 – 2016 Working with communities and mining operations helped me gain valuable skills and allowed me to work with a variety of people connected to the industry. It was an opportunity not only to mentor youth, but to also be mentored myself by industry professionals.

Kimberley Taylor, BSc Candidate, Earth Science and Aquatic Resources, St. Francis Xavier University

2016 Not only did I learn valuable lessons that will carry-over into my career, I was able to combine my experience with children and my passion for geology which made for a thrilling summer.

Alexandra Squires, MSc Candidate, Geology, Acadia University



Mining makes a difference in many ways!

Warm Welcome in Ring of Fire

Mining Matters staff and the communities in the Ring of Fire, a mineral resource-rich area covering about 1,606 km² in Northern Ontario, are truly getting to know each other. In 2015 and 2016, **Mining Matters** visited 14 Ring of Fire communities, presenting nine summer camp programs and five school programs reaching 826 youth, thanks to the generosity of the Ontario Ministry of Northern Development and Mines (MNDM) Ring of Fire Secretariat, Ontario Geological Survey and Aboriginal Relations Branch. Community events showcased the programs and involved families with activities including Soapstone Carving and Amethyst Jewellery Making.

Mining Matters programs, designed to feature local geology and mineral exploration, introduce youth and their families to Earth science and the mining industry. The programs encourage and enhance youth education and highlight the many career opportunities in the minerals industry. As written by Lori Churchill, Director Ring of Fire Secretariat, Ministry Northern Development and Mines, August 2016 "*Mining Matters has regularly exceeded expectations in the delivery of their programming and have received positive responses from communities to whom they delivered the Mining Rocks Program.*"



MNDM works with government, industry and Indigenous peoples to encourage responsible, sustainable economic development in the region, one that promises significant mineral development opportunities, including production of chromite, nickel, copper and platinum.

Mining Rocks Earth Science Programs were featured as a case study in [Stepping Up: A Strategic Framework to Help Ontario's Youth Succeed](#), a 2015 Ministry of Children and Youth Services report. **Mining Matters** was identified as an organization that is taking innovative and collaborative action to support improved outcomes for youth.

We look forward to visiting 14 Ring of Fire communities in 2016-2017, thanks to continued funding from MNDM. It's wonderful to be welcomed back.

Thank you MNDM for your strong support and continued commitment to Ontario's Indigenous youth.

Coast-to-Coast

"I consider myself very fortunate to have been involved with **Mining Matters** pretty much from its inception. I have maintained my involvement because I believe that the Canadian Mining Industry is a tremendous contributor to the health, well-being and standard of living for all Canadians. **Mining Matters** plays a major role in providing the awareness, knowledge and importance of Canada's mining industry to students, educators and the public. The sooner we can educate students as to where things come from that they take for granted in their everyday lives the better off all Canadians will be."

John Heslop, Chair, Mining Matters, Toronto, ON, September 2016

"New Gold is proud and honoured to work with the **Mining Matters** program and its great team. **Mining Matters** happens right in our communities and makes a real difference. It brings the mining industry, environmental knowledge, technologies and opportunities right into the classroom and makes it meaningful. Being a part of this program helps students, teachers and the public understand the mineral industry and our commitment to a great future."

Grant Goddard, General Manager, New Gold Rainy River Project, Rainy River, ON, September 2016

"Indigenous and Northern Affairs Canada places its confidence in **Mining Matters** ability to raise young people's awareness of the Canadian mining industry and the role it plays in everyday lives."

Ms. Cadieux, Program Officer, Indigenous and Northern Affairs Canada, Gatineau, QC, August 2016

"The collection of teaching models are invaluable. The opportunity to attend the trade show is also an amazing opportunity."

"Outstanding day. A great team share their passion and expertise freely. This is the best type of PD. Many thanks!"

Teachers, PDAC Convention Teachers' Day Workshop, Toronto, ON, March 2016

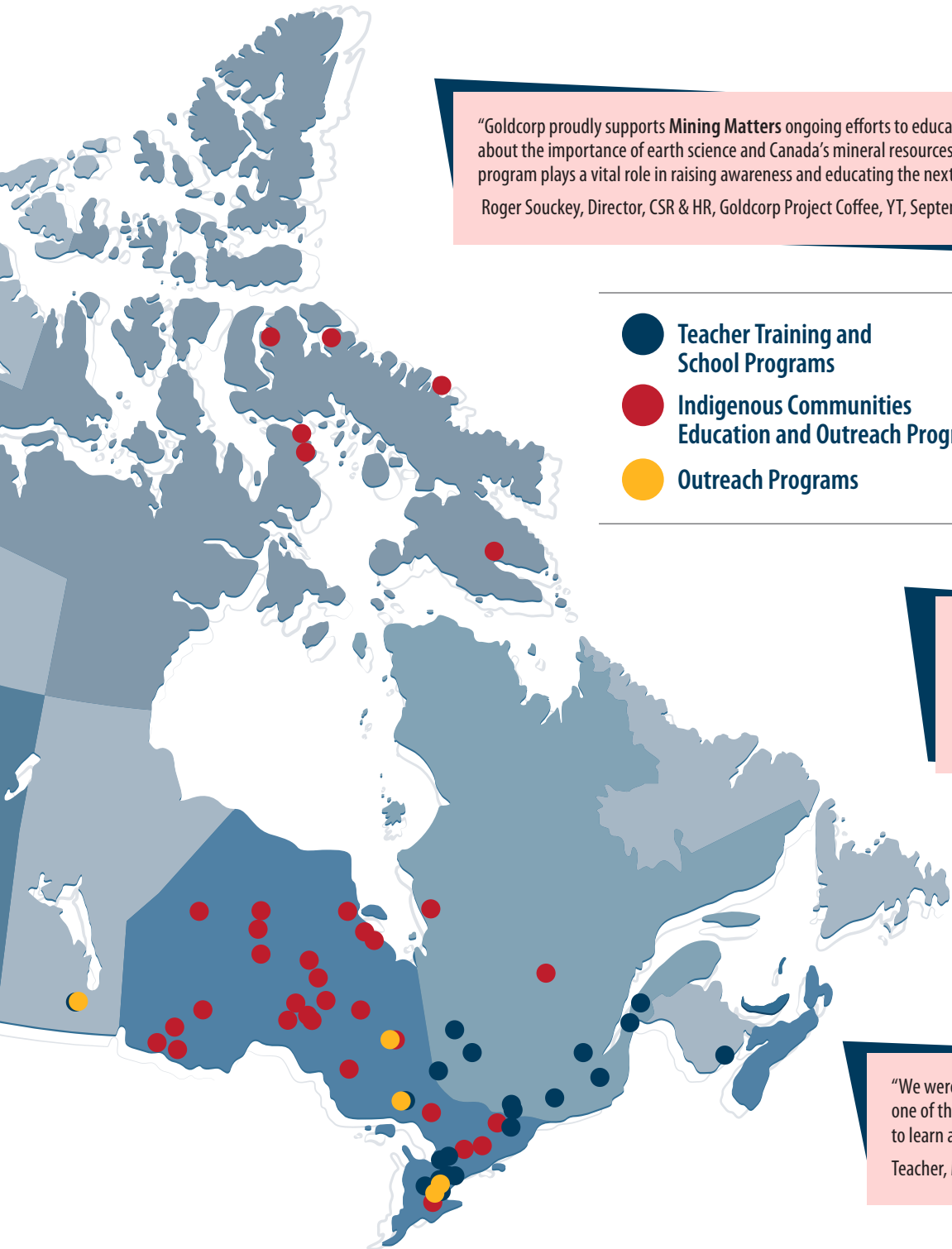
"I learned that rocks, minerals and the mining industry are inspiring. Being a geologist is very interesting as well as the research. It is also challenging."

Elementary Student, PDAC Convention Students' Days Workshop, Toronto, ON, March 2016

"Mining industry is composed of many other professions in Canada and it is a global business."

Secondary Student, PDAC Convention Students' Days Workshop, Toronto, ON, March 2016





“Goldcorp proudly supports **Mining Matters** ongoing efforts to educate youth and the public about the importance of earth science and Canada’s mineral resources. The **Mining Matters** program plays a vital role in raising awareness and educating the next generation.”

Roger Souckey, Director, CSR & HR, Goldcorp Project Coffee, YT, September 2016

“My favourite activity was product matching, because I learned minerals (and rocks were actually used in daily life items.”

Participant, *Mining Rocks* Earth Science Program, Stornoway – Cree Nation of Mistissini, QC, June 2016

- Teacher Training and School Programs
- Indigenous Communities Education and Outreach Programs
- Outreach Programs

“It was a fun morning and it’s a good program to help us and get interested and learn many new things.”

Participant, *Mining Rocks* Earth Science Program, Goldcorp - Cree Nation of Wemindji, QC, October 2015

“They have provided excellent and unique learning opportunities to my students that have opened their eyes and minds to new and interesting content ... They have offered students and their community opportunities they could not have found anywhere else.”

Aaron Hobbs, Principal, Migizi Miigwanan Secondary School, *Mining Rocks* Earth Science Program, Long Lake 58 First Nation, ON, July 2015

“Before I came to this program I thought about going in the army and not going to school but now I would like to be a geologist and go to college and university.”

Participant, First Nation Natural Resources Youth Employment Program, *Mining Rocks* Earth Science Program, Mink Lake, ON, August 2016

“We were able to examine a wide variety of rocks ... also learned that the mineral graphite is present in one of the lakes in Rockwood Park and that graphite is used in making pencils... a wonderful opportunity to learn about rocks and minerals in a natural setting. Thank you again for a fantastic trip.”

Teacher, Macdonald Consolidated School, Rockwood Conservation Area Field Trip, Eramosa, ON, June 2016

A Record Year for the

WHERE challenge

In 2016, **Mining Matters** WHERE Challenge saw the number of submissions more than double from the previous year! We are thrilled with a record breaking 284 entries that inspired 462 students and 17 teachers to answer “What on Earth is in their stuff?” and “Where on Earth does it come from?” in many creative ways. For the first time, we offered WHERE Presentations in classrooms, which built interest and renewed excitement about the contest.

The WHERE Challenge is a national contest endorsed by the Canadian Earth sciences community that motivates students ages 9 to 14 to explore the fields in which geoscientists work: **Water, Hazards, Energy, Resources** and the **Environment**. Students discover and creatively tell a story through different mediums about why non-renewable resources are so important in everyday life. The contest ignites students’ curiosity about the origins of everyday items and encourages them to explore the mining, energy and environmental sectors for possible career opportunities. The contest is a great way for students to combine classroom learning with

real world relevance, curiosity with practical research and creative ideas with production technology.

Entries are received from across Canada and a volunteer judging panel made up of industry and Earth science partners selects winners in each of the three categories of projects; Multimedia, Graphic Art or Literary, awarding over \$7,500 in cash prizes.

Launching in September, the 2017 WHERE Challenge will accept entries online in English and French, until March 9. Winners will be announced May 15, 2017.

As in previous years, the contest relies on the enthusiastic and continuous support of the industry. **Mining Matters** invites industry members to join our judging panel. Please visit our new WHERE Challenge Judges Registration online form at MiningMatters.ca to register.

Get involved with the WHERE Challenge:

- ✓ Share information about the contest with colleagues, family, friends and your social media network
- ✓ Help a local educator or youth leader with the Challenge in their classroom or club
- ✓ Encourage youth to participate

For more information about the contest and view some of the past winning entries, visit www.earthsciencescanada.com/where.



Juges francophones : nous faisons appel à votre sens de l'engagement!

L'année dernière, 462 élèves ont participé au Défi, parmi ceux-ci, 7 projets ont gagné au niveau national, dont 4 étaient en Français! Ce concours pancanadien bilingue continu d'être un succès grâce au soutien de l'industrie; c'est pourquoi le Défi de la Terre demande aux membres du secteur minier de se mobiliser et rejoindre le jury francophone. Pour vous inscrire, visitez le miningmatters.ca ou communiquez avec **Une mine de renseignements** au (416) 863-6463 poste 332.

Water • Hazards • Energy • Resources • Environment



When Teacher Support Transitions to Active Collaboration

Mining Matters delivers teacher workshops and sessions at various educational events throughout the year, providing opportunities to engage closely with teachers and share **Mining Matters** resources. Among the great teachers encountered yearly, many stand out for their enthusiasm and willingness to enhance their students' learning experiences with cross-curricular activities and real-world teachings. Teacher Judy Tutchener and her colleagues from the Geography Department at Dr. Norman Bethune Collegiate Institute in Scarborough are excellent examples. They have been collaborating actively with the **Mining Matters** team over the past two years. This ongoing relationship has led to successful engagement opportunities with their students as well as continuous teacher support to approach Earth science concepts through new lenses and help with the implementation of relevant hands-on activities in their classrooms.

Joining forces during this past school year, we delivered seven WHERE Challenge presentations at Bethune resulting in 148 students creating successful WHERE projects. As communicated in the school's newsletter to parents and students, "...we were

thrilled with our results in this national contest! Bethune won one of three national school prizes for our combined effort." In addition, Ms. Tutchener's students had the opportunity to participate at our 9th annual Education Program at the PDAC Convention. These events provided opportunities to enhance the students' understanding of mineral exploration, mining and the importance of mineral resources in everyday life.

Next year's support for Ms. Tutchener and her team is already underway, with students using **Mining Matters** Scientific Testing of Minerals Equipment to examine everyday materials ranging from make-up to Lego in order to discover what is in their stuff, where does it come from and why should we care.

Mining Matters was pleased to be featured twice in the school's 2016 newsletters, spreading the good news about our programs. Developing strong enduring partnerships with passionate teachers like these, broadens **Mining Matters** outreach and ignites Earth science interest within students.

When the Classroom and the World of Work Meet

Each year during the PDAC Convention **Mining Matters** offers an education program for teachers on Sunday, elementary students on Monday and secondary students on Tuesday. This year Teachers' Day was attended by 32 teachers and pre-service teachers; a further 151 students and 14 adults attended the Students' Days.

The theme of the education program changes every year. In 2016 the theme was 'Mining our Business', which focused on making connections between the world of school and the world of work; bridging the curriculum with the world outside the classroom. Teachers' Day focused on drill core and core techniques that included a stop at the Core Shack

to demonstrate the day's learnings. The afternoon consisted of guest speakers, breakout sessions and a *Deeper and Deeper Workshop* for those teachers interested in exploring the **Mining Matters** Resource Kit. Feedback was positive, one teacher said "Thank you for a very informative day. The hands-on activities this morning were interesting, fun and a great precursor for visiting the core shack. Great keynote speakers."

During the Students' Days each school had the opportunity to visit the Trade Show on a guided tour, participate in curriculum-based, hands-on Earth science activities and hear the experiences of our keynote speakers. One of the elementary

students said "I learned that rocks, minerals and the mining industry are inspiring. Being a geologist is very interesting as well as the research. It is also challenging." Highlights for the secondary students included learning about the optical properties of minerals, examining core samples and creating a keepsake using copper and amethyst.

Thank you to IBK Capital Corp., who made the program possible through their sponsorship. A thank you also goes to PDAC and our guest speakers; Nicole Januszczak, Targeting and Review Manager for De Beers Group of Companies in Canada and Peter Larson, Director EHS Americas.





Three Cheers for Field Trips

Students usually cheer when they hear about a field trip. A change from the classroom, field trips are fun, but more than that, they connect classroom material to reality, the environment and the everyday world. Earth science related trips bring new experiences to students: perhaps donning hard hats, clambering over rocks, hunting for geological clues, discovering treasures or meeting interesting experts.

Since 2006, the **Mining Matters** Field Trip Subsidy Program has helped make Earth science related field trips happen. Last year 493 students and 58 adults went on **Mining Matters** subsidized field trips. Students in Kingston, New Brunswick went geocaching and learned about rocks and minerals in Stonehammer Geopark. Other classes have gone to Québec's Cite de l'Or historical museum and underground mine, the Lafleche cave system, Ontario and Manitoba quarries, and Earth science venues such as Toronto's Royal Ontario Museum (ROM), Sudbury's Science North and Dynamic Earth and the Earth Science Museum at the University of Waterloo.

Teacher Marjorie Siertsema writes enthusiastically about her grade 4's trip to Waterloo's Earth Science Museum, *"At the University, the students were able to view a slide show presentation on rocks and minerals, observe and handle fantastic rock and mineral specimens, imagine life as a miner while in a replica mine tunnel, explore the rocks and minerals on display while completing a scavenger hunt and pretend to be paleontologists while digging away at fish fossils!"*

Regarding a recent field trip to the ROM, Montessori Elementary Director Nicole Tal writes, *"It was quite an experience and outing for us. . . the Mining Matters subsidy allowed our students the*

opportunity to touch and see meteors, minerals from deep inside the Earth and larger rocks that they have been studying in class."

The 2016 - 2017 school year brings exciting changes to our Field Trip Subsidy program which will allow even more students to benefit as we expand approved field trip destinations and invite applications from a larger group of teachers.

The subsidies, meant to offset transportation costs and entrance fees to geoscience venues and stone, sand and gravel operations, have been expanded to include trips involving Earth materials, processing and manufacturing. **Mining Matters** encourages active outdoor field exploration such as rock walks and visits to quarries and rehabilitated mine sites, plus indoor excursions to museums and science centres, to experience and reinforce geosciences concepts.

Previously, funding requests were accepted only from teachers who have completed an in-service workshop and use a **Mining Matters** resource kit in the classroom. Under our new model, these teachers are assigned Tier 1 status and can apply for up to \$500 per year. New Tier 2 funding will allow any Canadian teacher to apply for up to \$250 for an approved school excursion.

Mining Matters would like to thank Canadian Securities Exchange, our 2016 Field Trip Subsidy Sponsor, for their generous support in making these educational experiences available. We invite other industry members to follow their example and invest in opportunities for more students to learn about Earth science both inside and outside the classroom.

Breaking New Ground: Sahtu Schools Mineral Introduction Tour

Students in the Sahtu Region, Northwest Territories, experienced a unique educational program for young Canadians about mining and its importance to maintaining quality of life. In April, **Mining Matters** delivered our signature interactive *Mining Rocks* programming to 134 students in grades 6 to 12 and 17 teachers at schools in Fort Good Hope, Déline, Norman Wells and Tulita. An exciting first for both **Mining Matters** and the region, the pilot program was planned and delivered in partnership with the Government of Northwest Territories, Department of Industry, Tourism and Investment (GNWT ITI).

Chief T'Selehye, Ehtseo Ayha, Mackenzie Mountain, and Chief Albert Wright schools welcomed **Mining Matters** staff along with Frank Pope, GNWT ITI Regional Petroleum Advisor and Valerie Gordon, Client Services and Community Relations Division of the GNWT ITI, frequent visitors to the communities, to share information about the potential for mineral

exploration in the Northwest Territories and for students to contribute to the future growth and development of their communities by staying in school and considering a career in the minerals industry.

The four days of engaging, sharing and caring interactions between students, school staff and the Sahtu Schools Minerals Introduction Tour Education team was a resounding success. *"It was very hands-on. Everyone was very engaged and had thoughts to share,"* recalls Pope. *"The recess bell would go and nobody would move. They were enthralled with what they were learning."* To learn more visit www.iti.gov.nt.ca/en/newsroom/mining-education-comes-sahtu.

Mining Matters looks forward to building on this successful program, further partnering with the GNWT ITI to deliver minerals education and career programming in the near future.



groundWORK

Laying the groundWORK

To support and motivate educators teaching Earth science, **Mining Matters** publishes *groundWORK*, an annual, bilingual educator newsletter, designed to help nurture students' natural curiosity about Earth science and mineral resources. Filled with informative articles, news about our available resources, hands-on activities, field trip suggestions, links to teaching resources, contests, Earth science tidbits and more; *groundWORK* provides a wealth of supplemental minerals education resources. *groundWORK* contains key articles and input from accredited classroom teachers, ensuring integrity of information and content that is current, appropriate and usable in the classroom.

Mining Matters invites you to explore the 2016 edition of *groundWORK*. Current articles examine: the role that stone, sand and gravel play in our daily lives, innovative site rehabilitation practices, drone use in industry, Indigenous peoples and Canada's mineral resources, clay minerals and their uses, and a student mine remediation science project. We introduce our latest installment of the *Mining Makes It Happen* poster series, *Medicine: From the Ground Up*, as well as our updated Field Trip Subsidy Program. We promote the WHERE Challenge, Earth science workshops and interesting publications and websites.

One of our featured activities uses a Smart Device microscope and polarized film to view thin sections, allowing students to explore rocks at a microscopic level and capture photos of their crystalline structure. To read *groundWORK* 2016 or previous issues, go to tinyurl.com/mm-grndwrk.



The Wonders of Clay

They goooey clay—a precious mineral? Well, perhaps not precious in the typical sense. Like gold, silver, or sparkling gems, but this stiff, sticky fine-grained earth, made up of tiny particles of many minerals, is precious as a workhorse of civilization, past and present.

Clay has the marvellous property of being plastic when wet, allowing it to be shaped into an endless variety of objects. Once dry, it retains its shape unless soaked in length. Once dry and fired at high heat, it cannot be returned to its plastic state. From prehistoric times, clay has been indispensable in architecture, industry, agriculture, food preparation, and art.

As a building material, it goes into bricks (sun-dried (adobe) or fired), wall and floor tiles, and drainage and sewage pipes. The major use of clay, after brick manufacture, is in the manufacture of cement.

In agriculture, clay contributes essential water retention and mineral richness to soils to make them ideal for growing. For food preparation and serving, people have long depended upon ceramics such as clay cooking pots and porcelain, china, and earthenware dishes. Ceramics grew into an art form, demonstrating human creativity and chronicling local needs, beliefs, and traditions: from the oldest known work of terracotta sculpture in the world, the Dolni Vestonice, through fine Greek vases, Italian Renaissance masterpieces, Chinese terracotta soldiers, and Inca ceremonial pottery, the list goes on.

Clay is found in medicine as well. Indigenous cultures have long used the healing powers of mud rich with clay minerals. In Australia, the Andes, and Central Africa, people ingested clays to cure diarrhea and stomach upsets or prevent poisoning from toxins. In Canada, the Heiltsuk First Nation has used mineral-rich clays for centuries for both external and internal medicine. Natural medicine today suggests bentonite clay, made up of weathered volcanic ash, for many internal and external uses.

In religions around the world, clay is cited as the medium from which humans were made by a supreme being. Egyptian, Sumerian, Chinese, Greek, and other mythologies, along with the Bible and the Qur'an all include statements that man was fashioned from clay. Whether or not true, the beliefs demonstrate the value given to clay in history.

But What is Clay?

Found in a variety of colours—grey, white, brown, red—clay is made up of mineral particles smaller than 0.004 mm. Its composition depends on the rocks it was created from. Chemically, clays are hydrated aluminum silicates, usually containing impurities such as potassium, sodium, calcium, magnesium, or iron. Depending on which mineral particles they contain, clays fall into three main groups, each with its own particular properties: kaolinite, illite, and montmorillonite.

Kaolinite
Named after the Kaoling mountains in Jiangxi Province in China.

Illite
Named by the locality where it was first found, Illinois, USA.

Montmorillonite
Named after Montmorillon, France, where it was first reported.

Clay occurs around the world as residual or sedimentary deposits. Residual clay has formed in place, a product of surface weathering, which causes chemical decomposition of rocks, such as granite, containing silica and aluminum silicates, which, being insoluble, are deposited as clay, or disintegration and solution of shale. Sedimentary clay has been removed from the rock sources by erosion and deposited in a new and possibly distant position.

Kaolinite, the most abundant clay mineral, has been used in China since early times for pottery and ceramics. It is also used in the production of paper and in pharmaceuticals as an ingredient in some medicines. Kaolinite is also used as an ingredient in some cosmetics, soaps, paints, and toothpastes.

Illite is a widespread component of sediments from minerals in the mica family. It is one of the main clays used to make traditional ceramics.

Montmorillonite comprises extremely small particles produced by volcanic and hydrothermal activity. It is the principal constituent of bentonite and fuller's earth. Bentonite is used in laundry work, refining petroleum, and in drilling mud used to protect cutting bits. Other uses are in the water in purifying sewage in the paper, ceramics, plastics, and rubber industries and in natural health practices. Fuller's earth is used to absorb impurities or colouring bodies from fats, grease, or oils.

Aggregates: Foundation of Society

Sand, stone, and gravel are not glamorous. Plain and simple, they attract little attention from the general population, yet they make up the foundations of our society. Used for roads, buildings, bridges, sewers, sidewalks, railways, even paint and paper, and more, they are extracted from pits and quarries near cities and towns across Canada. From pits and quarries near cities and towns across Canada, between 10 and 18 million tonnes of aggregate are used in the construction of a typical single-family home. Building a school or hospital requires approximately 1,000 tonnes and constructing one kilometre of four-lane highway takes about 15,000 tonnes. Before aggregates can come out of the ground, years of planning must go in. In Ontario, the aggregates industry is among the most highly regulated industries. No activity at risk permits, hydrogeological assessment, impact assessments, environmental monitoring, engineering, and rehabilitation plans must all be completed, and the land must be left safe, environmentally sound, and ready for use.

Correcting the Past

With the establishment of Ontario's Aggregate Resources Act (ARA) in 1990, aggregate resource companies were given a new set of rules. Before that time, pits and quarries were allowed to operate differently. The new rules strengthened requirements for progressive and final rehabilitation and made licensing more controlled. Operators who wouldn't conform to their sites were no longer legally allowed to operate, and their sites were abandoned. Those sites that are now unrecognizable as their own. As many as one third are now unrecognizable as their own. As many as one third are now unrecognizable as their own. As many as one third are now unrecognizable as their own.

New and Looking Ahead

Mining Matters Partners with STEM Camp

In the summer of 2016 **Mining Matters** partnered with STEM Camp to inspire youth through hands-on activities in the areas of **Science, Technology, Engineering and Mathematics (STEM)**. The organization engages subject matter experts to describe how STEM and camp activities relate to their lives, opening campers' eyes and inspiring them!

During the first weeks of July and August, **Mining Matters** contributed geology and mining expertise to the Minecraft theme week, travelling in teams of two to cover 40 camps in 27 locations in southern Ontario and Ottawa, delivering 90-minute workshops to campers. A lot of ground was covered in two weeks!

Many participants knew the Minecraft game and understood something of rocks and minerals; some even recognized our obsidian, andesite and diorite samples. Others asked questions about Earth processes, smelting, diamond

stability zone, chemistry and more. By the end of our workshop, campers understood more about Earth science, rocks and minerals and how diamonds are formed. Participants were pleased to receive rock and mineral samples and a **Mining Matters** Activity Book.

The workshops reached an impressive number of campers, 1,260 in all, with boys outnumbering girls at the camps, by nearly 3:1. The **Mining Matters** team, all women, sent a very positive and encouraging message about women in the industry. We encourage industry members to spread a similar message, encouraging young girls to pursue STEM studies.

Mining Matters initial partnership with STEM Camp was a tremendous success. We look forward to future collaboration.

Medicine: From the Ground Up

Mining Matters has released the fourth poster, *Medicine: From the Ground Up*, in our series of *Mining Makes It Happen* resources. From head to toe, skin to bone, brain to heart, the human body is made up of complex systems. Learning about these systems, looking after them and enhancing them, challenges the medical world daily. Ancient healing practices, modern medicine and tomorrow's discoveries rely on our world's natural resources. Essential dietary elements, care regimes, surgical instruments, medical devices, diagnostic aids and life-saving treatments all use the metals and minerals of the Earth.



MEDICINE
FROM THE GROUND UP

 **From head to toe, skin to bone, brain to heart, the human body is made up of complex systems.**

Learning about them, looking after them, and enhancing them has challenged the health community since the dawn of medicine. Ancient healing practices, modern medicine, and tomorrow's discoveries rely on our world's natural resources. The Earth supplies us with the metals and minerals that contain the necessary components for dietary essentials, care regimes, surgical instruments, medical devices, diagnostic aids, and life-saving treatments. Canada, as one of the world's largest mining nations, produces more than 60 minerals and metals, many of them necessary to the world of medicine.

Mining Makes It Happen!

Order your poster today!
Send your request to
info@miningmatters.ca

Mining Makes Good Health Happen



Rocks + Kids = Opportunities

Not every school can offer exciting learning resources to its students. Budgets are stretched and teachers do the best with what they have. **Mining Matters** can offer resources that make a difference. We are excited to announce the launch of our *Rocks + Kids = Opportunities* Earth Science Project.

This fall, we will partner with school boards to deliver a series of Earth science and mineral resources workshops in schools located in underserved communities in the Greater Toronto Area. The program is designed to broaden perspectives and knowledge and to create new opportunities for youth.

Rocks + Kids workshops will spark interest in geoscience, create awareness of career opportunities in the minerals industry and provide support to teachers

delivering the Earth sciences curriculum. Fifteen workshop topics will be available, including *Mystery Minerals*, *What's Yours is Mined*, *Rocks and Fossils of Ontario* and *Career Bingo*. Participating teachers will receive teaching resources to help them continue to actively engage their students in Earth science year after year. A minimum of 20 classroom programs are projected in the first year of the project, reaching approximately 400 students and their teachers.

Mining Matters wishes to thank the Canadian Geological Foundation for their generous support of this important initiative. The Foundation is dedicated to the furtherance of geoscience in Canada and plays a key role in sustaining geoscience education, outreach and awareness across the country.



On-line Tutorials for Teachers

At **Mining Matters**, we are excited about a new project. In 2017, we will produce a series of on-line tutorials for teachers to replicate fundamental aspects of the in-person professional development experience we provide to teachers wanting to implement our Earth science curriculum resources in the classroom.

A review of the statistics published in the 2015 Ontario College of Teachers Annual Report show that of the over 47,000 teachers with Basic Qualifications in Science, less than 4% report having geoscience or environmental science qualifications. **Mining Matters** can help bridge this gap. **Mining Matters** teacher workshops and curriculum resources inspire and motivate teachers while enhancing their understanding of mineral resources and Earth science. Our curriculum units are designed to meet the educational goals of individual provinces or territories. They have been written by accredited classroom teachers, and the integrity of the content has been verified by technical experts, making them current, appropriate and usable in the classroom.

Prior to obtaining a **Mining Matters** Resource Kit, teachers participate in a workshop to learn how to effectively implement the resource in their instructional practice, an integral part of our program.

We currently deliver teacher workshops during PD days, at annual teacher conferences and at industry conferences. We work in collaboration with school boards, teacher federations and provincial ministries. However, teachers don't always have the time to go to one more workshop, take one more course or attend one more conference. Using our new series of on-line tutorials, those teachers will be able to complete the training requirements for the resources, previously trained teachers will be able to utilize the tutorials for ongoing support and teachers inheriting a resource from a previously trained teacher can learn about the material.

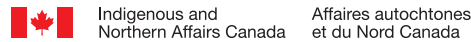
Our new on-line tutorials will showcase our excellent resources and make them accessible to an even larger audience of teachers, something to be excited about!

Thanks to our Contributors!

As a charitable organization, **Mining Matters** greatly appreciates contributions from the minerals and aggregates industries, individuals, foundations, corporations and government. These generous donations make possible all aspects of our program development and implementation.

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Invest in Mineral Resources Education

Mining Matters delivers exceptional Earth science education and brings knowledge and awareness about Canada's geology, mineral resources and the mining industry to students, educators and the public. We are grateful for the contributions of many loyal supporters that have made our goals a reality.

Your donation does make a difference! It provides the foundation for our important work and is critical to our ongoing vision of bringing Earth science to life.

As a charitable organization, **Mining Matters** program development and delivery are made possible only through the financial sponsorship, donations and in-kind contributions of the mineral and aggregate industries, individuals, foundations, corporations and government.

We are asking for your support, so that we may continue to provide current information to students, educators and the public about the importance of rocks, minerals, metals and mining in everyday life and the diverse career opportunities available in the minerals industry.

An official charitable receipt will be issued for contributions \$25 and greater. For more information or to donate, please contact frasergrand@miningmatters.ca or call 416-863-6463 ext. 334.

Donating Shares

Donating shares to **Mining Matters** may be of interest due to the considerable tax benefits that can be realized. The elimination of capital gains on stocks, bonds and mutual funds means that a contribution results in a tax receipt equal to the fair market value of your gift. Rather than being subject to tax on 50% of the gains for shares sold during your lifetime, accrued capital gains on donated shares are exempt from taxes. In effect, the tax benefit arising from your gift is superior to making cash donations. The donation of flow through shares can produce even greater benefit, as a deduction is offered at the time of purchase and a tax credit is generated when the shares are gifted. However, rules apply to the amount of the exemption for capital gains.

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For individuals who have not donated previously to charities, there is the First Time Donor's Super Credit (FDSC). This applies to cash donations and not contributing shares. The FDSC supplements the charitable Donation Tax Credit (CDTC) with an additional 25% tax credit for a first-time donor on up to \$1,000 of cash donations. Accordingly, a first-time donor is entitled to a 40% federal credit for donations of \$200 or less and a 54% federal credit for the portion of donations over \$200 but not exceeding \$1,000. There are also provincial tax credits, which vary across provinces. For example, in Ontario, combined tax credits give a \$611 tax credit for every \$1,000 donated and in Québec, \$744. Individuals will be considered a "first time" donor if neither the

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To learn more, contact Edward Thompson at 416-366-6083 or egt@interlog.com, or Durham Sims, **Mining Matters** Investment Advisor at RBC Dominion Securities at 416-842-3086, 800-561-4468 or durham.sims@rbc.com. Both Mr. Thompson and Mr. Sims serve in a volunteer capacity.

Making Connections with Mining Matters

Each year mining industry professionals come together to make and renew acquaintances, network and have fun, all for charity, at **Mining Matters** fundraising events. Why not get involved in 2017?

To mark the start of the PDAC Convention, step on the ice at the **Mining Matters Hockey Tournament**, March 4, 2017 for a full day of competitive hockey. If hockey is not your sport; then tee off June 15, 2017 at the **Mining Matters Diamond in the Rough Golf Classic** or participate in the **Rock Cycle Ride**. While each event requires different skills and abilities, all provide an opportunity for participants to support a great cause, while enjoying a day with friends and associates in the mining industry.

Save the dates and plan to be part of the fun!

Why not get involved?



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