The goal of the Queen's Community Outreach Centre (QCOC) is to improve the outcomes for children and youth who are “at-risk” in science, technology, engineering, mathematics (STEM) education and literacy. The QCOC is determined to make a positive impact by carefully planning and implementing programs, activities and research which allows for the participation of all families, including those from lower socioeconomic backgrounds, minority groups, and those with at-risk students. We engage parents, teachers, community agencies and volunteer associations who contribute to the education of children both inside and outside of classroom walls. We strive to help all caregivers, who play an important role in one way or other, to learn how to support the development of positive attitudes towards STEM and literacy, and to support formal and informal learning that positively impacts student achievement in these domains.

With these goals in mind, throughout 2012, the QCOC expanded and sought to improve each of its annual, signature programs: (1) Community Research Partnerships; (2) STEM-focused Alternate Practicum Placements; (3) Science Rendezvous Kingston; and, (4) professional learning for parents and teachers.

In an effort to extend its reach and achieve its mission, the QCOC also embarked on some novel collaborations that included projects with Youth Science Canada (YSC), Let’s Talk Science (LTS), FIRST Robotics Canada, The Museum of Science and Technology, The Education, Quality and Accountability Office (EQAO) and The Royal Military College of Canada (RMCC).

In collaboration with LTS and YSC the QCOC was able to support Smarter Science workshops for local teachers and deliver engaging demonstration lessons in Grade 1 to 12 classrooms across the region.

Through our collaboration with FIRST (For Inspiration and Recognition of Science and Technology), a leading not-for-profit organization whose role is to find, inspire, and build the next generation of science and technology leaders, we had the opportunity to establish two community robotics teams (W.A.F.F.L.E.S.) that involved elementary and secondary students, BEd teacher candidates, graduate students from Queen’s, volunteers from St. Lawrence College and experts in the area. On December 9, 2012, The QCOC hosted the first LEGO® League Eastern Ontario Provincial qualifying competition. Twelve teams from across the region participated. On March 9, 2013 our high school team won the ROOKIE ALL STAR AWARD and the privilege to represent Canada at the World Championships for FIRST in St. Louis, Missouri in April.

In July 2012, 60 Sea Cadets (aged 14-16) from across Canada, had the opportunity to participate in three interactive modules: Green Roofs, Frogs and Pollution, and, The Use of Surfactants in Environmental Remediation developed by BEd teacher candidates in collaboration with RMCC Faculty. This pilot project allowed us to develop plans for SCIENCEWORKS! a summer STEM enrichment program.

At teacher professional learning sessions at The Museum of Science and Technology, the Ontario Association for Mathematics Education Annual Conference, and Parent Mathematics Forums across the province (Toronto, Ottawa, Peterborough, Thunder Bay and Windsor) the resources from the QCOC website have been showcased and shared widely.

We are about to embark on a visit to leading STEM Centres in the Greater Boston area to learn how we can improve upon our efforts to raise awareness of STEM subjects, careers and opportunities. A special STEM/Community Outreach edition of The Education Letter will be published in May 2013. Our projects will be featured in paper and poster sessions at national conferences in Victoria, BC and St. John’s, NL. And Science Rendezvous Kingston is bigger than ever! Our exciting line-up includes a pool-playing robot, a laparoscopic surgery simulation station, the police tactical squad repelling to illustrate the use of gears and levers, and solar off-road All-Terrain Vehicles racing up and down The Tragically Hip Way.

On behalf of the Kingston community, Queen’s and the Faculty of Education, I would like to close by expressing my sincere appreciation to the Imperial Oil Foundation for its generous support of our work, and for enabling us to achieve the far-reaching goals of our ambitious endeavours. It is a privilege to be able to coordinate so many engaging programs and by so doing, impact learning and learners of all ages.

Lynda Colgan
# TABLE OF CONTENTS

## SECTION 1: Community Research Partnerships

Introduction

2011-2012 Research Partnership Summary of Findings
- Kingston Literacy and Skills
- Hastings & Prince Edward District School Board
- Let’s Talk Science
- Kingston Literacy and Skills
- Big Brothers, Big Sisters
- H’art School Poster
- H’art School
- Royal Military College of Canada

2012-2013 Community Research Partnerships
- Kingston Youth Arts Cooperative
- H’Art School
- Kingston Literacy & Skills
- Pathways to Education

## SECTION 2: Alternate Practica 2012

Introduction

Mathakazam!

Photo Collage

Let’s Talk Science

Mathematical Melodies

Museums

The Royal Military College of Canada

## SECTION 3: STEM Outreach Activities

*Science Rendezvous Kingston 2012*

Introduction

Proclamation

Participants

Sponsors

Station Coordinators

Volunteers

Sample Page from Take-Home Book

*W.A.F.F.L.E.S. Community Robotics Team*

What is *W.A.F.F.L.E.S.*?

*W.A.F.F.L.E.S.* Activities

*W.A.F.F.L.E.S.* Team

*W.A.F.F.L.E.S.* Photos

## SECTION 4: BUDGET

Financial Statement

## SECTION 5: NEXT STEPS

STEM Ambassador Contest

The Education Letter

Science Rendezvous 2013

FIRST Robotics Partnership

Knowledge Mobilization: Conference Presentations

Knowledge Mobilization: Papers

**SCIENCE RENDEZVOUS PHOTO COLLAGE**
Each year, the QCOC supports a number of local community organizations and agencies whose mandate complements or supplements its own goals and principles.

The Community Research Partnership projects, which are adjudicated annually in August, run from September to April: culminating in a Poster Conference in May which celebrates the studies by sharing the results with local educators, researchers, organizations and agencies.

Because of the overlap in “years” for the QCOC (April 1 – March 31) and the Community Research projects (September 1 – April 30), this Annual Report includes both the summary of findings for the 2011-2012 funded projects and descriptions of the goals and purpose for the 2012-2013 projects. A sample poster from the 2011-2012 Community Research Partnership conference (held May 24, 2012 at The Donald Gordon Centre) is also included.

In this report, the QCOC would like to acknowledge the contributions of the 2012-2013 Adjudication Committee: Dr. Nancy Dalgarno (QCOC), Diane Davies (Office of Research Services, Queen’s), Dr. Sue Fostaty-Young (The Centre for Teaching and Learning, Queen’s), and Dr. Andrea Martin (Faculty of Education, Queen’s).

We believe that the QCOC is unique in its community research partnership program. The community-university relationship has historically been a hierarchical relationship that leads to community groups and university faculty working in parallel toward similar goals, which suggests there is little to no reciprocity of enactment in public education (Warren, 2011). To this end, we have applied to SHHRC for an Insight Grant to study our participatory approach. Our belief is that academic and community partnerships must be viewed and valued as multi-dimensional, authentic collaborative approaches and that universities should be involved in local initiatives by seeking out and supporting research essential to representative stakeholders, and making the results accessible and scalable. Very few universities or community-based organizations have collaboratively utilized community partners and graduate students to assist in researching evidence-based community projects that benefit the public in our area (Nicotera, Cutforth, Fretz & Thompson, 2011; O’Meara & Rice, 2005). The QCOC is unique in its efforts to conduct empirical examinations of our community programs involving community partners, consumer representatives, university faculty, and graduate students: all of whom participate in the research design, implementation, and knowledge mobilization process.
The purpose of this study was to determine if family involvement in a play-based family literacy program influenced the knowledge and perceptions of mathematics in the family unit.

The findings indicated that as a result of the ESSO Family Math program:

- there was an increase in parents and caregivers understanding and comfort with the Ontario mathematics curriculum,
- there was an increase in parents’ and caregivers’ knowledge of available resources. The participants’ belief about what could be used as a mathematical resource was found to expand from store bought books and tools to everyday items found around the home, and
- the parents’ and caregivers’ perceptions of mathematics teaching and learning were positively influenced.

This research project clearly found that family involvement in a play-based literacy program influences the knowledge and perception of mathematics in the family unit. Future studies may wish to focus on how family involvement in a play-based literacy program impacts the knowledge and perception of the children who participate.
Partners
Randy Votary, Hastings and Prince Edward District School Board

Research Assistant
Terry Bridges, PhD Candidate, Queen’s

Lesson Study and Middle School Science Teaching

The two research questions this study addressed were:

1) How does participation in a science-based lesson study project influence middle-school teachers’ science subject matter knowledge, science pedagogical-content knowledge, and self-efficacy in teaching science, and

2) What are the perspectives of Grade 7-9 teachers, their principal and Board coordinators on science-based lesson study, and what benefits and challenges do they associate with lesson study?

Patterns emerged in teacher self-efficacy and pedagogical-content knowledge. The findings suggest that (a) the teacher with the lowest initial self-efficacy had the largest gain in overall self-efficacy while the teacher with the highest initial self-efficacy had the largest drop in self-efficacy, (b) the teacher showing the most leadership and commitment to the study had the highest final overall self-efficacy, (c) the two teachers with the largest gains in self-efficacy were the ones who taught the lesson, and (d) the two teachers with the least teaching experience had the largest drop in self-efficacy. In terms of pedagogical-content knowledge, the findings suggest that lesson study improved the participant’s ability to identify scientific concepts and to assess student thinking about scientific concepts.

Partners
Audrey Hagar, Queen’s LTS Coordinator

Research Assistant
Sean Beaudette, MEd Candidate, Queen’s

Pre-service Teacher Attitudes towards Science

The purpose of this research was to assess the attitudes of pre-service teachers towards science teaching before and after teaching a series of hands-on, innovative science outreach activities. This research involved pre-service teachers being paired with experiences LTS instructors to conduct science and technology workshops in schools. The findings indicate that most pre-service teachers lacked confidence about teaching science in their future classrooms due to a lack of experience and science knowledge. By participating in the LTS partnership, the teacher candidates gained self-confidence in both scientific knowledge and pedagogy. The data analysis also suggested that teacher candidates gained experience in collaboration, team teaching, hands-on instruction and differentiated learning. The primary recommendation for future iterations of this project was to pair pre-service teachers with science experts from other faculties to combine science knowledge, classroom management, and teaching strategies in order to make the LTS program even more successful.
Partners
Deb Nesbitt-Munroe, Early Literacy Specialist
Jenna Willoughby, Early Literacy Specialist

Research Assistant
Jessica Chan, MEd Candidate, Queen’s

Literacy Training Needs of Early Learning Professionals

The purpose of this study was to investigate the types of literacy training needed by early learning professionals in Kingston and the Islands and how the needs could be met effectively. The findings from the research indicate that (a) there are higher levels of engagement, participation, questions and discussion in smaller group and sessions that are conducted on weekend mornings and (b) participants sought specific tools, skills, and examples that could be used within their early learners’ environments. Participants also found the workshops provided by KL&S to be productive, engaging and informative experiences that promoted networking opportunities. Many participants were interested in attending additional workshops if offered.

Recommendations for future workshops included longer sessions, sharing ideas/experiences, and continued introduction of new material and resources. The findings also indicate a need for future workshops that include mathematical development and meeting literacy training needs for early second language speakers.

Big Brothers Big Sisters

Partners
Tracy Holland, Executive Director
Vajmeh Tabibi, In-School Mentoring/Group Coordinator

Research Assistant
Jenn deLugt, PhD Candidate, Queen’s

The Big Brothers Big Sisters In-School Mentoring Program Revisited: Can Match Longevity and Quality be improved to Enhance Program Efficacy?

The purpose of this research was to evaluate a local Big Brothers Big Sisters in-school mentoring program to determine how longevity and quality can be enhanced in order to improve the efficacy of the program. The findings indicated that the mentees (students) were very positive about the relationship they had with their mentors as 91% described the match as “awesome” and they also described feeling special because their mentor seemed to enjoy their company, was involved in their life for the long-term and comforted them when problems occurred. When asked to recommend improvements to the program the mentors suggested meeting their mentees outside of the scheduled in-school meetings, increase the connection between the school and mentoring program and ensure the match is diligently made to ensure a good fit between the mentor and mentee. Recommendations also included providing ongoing training/support for the mentors, and shared-decision making between the mentor and mentee in terms of activity engagement.
ACKNOWLEDGEMENTS

BACKGROUND

Assistive technology, specifically computer technology, addresses and benefits educational needs for students with intellectual disabilities (Blackhurst & Edyburn, 2000). These technologies have the potential to enhance student’s educational achievement and self-image (Sivin-Kachala & Bialo, 1993). In addition to the use of technology for traditional instructional purposes, students with intellectual disabilities can benefit from technology to support learning in a wide array of life skills areas (Wehmeyer, Smith, Palmer, & Davies, 2004).

Unfortunately, students with intellectual disabilities cannot always easily obtain and use traditional assistive technological devices (Wehmeyer et al., 2004). Touch screen devices such as the iPod Touch, iPhone and iPad offer promising enhancements for those with an intellectual disability. In terms of functionality, the iPad tablet has recently been considered to be a new platform for classroom computing (Walter & Baum, 2011).

PURPOSE

The purpose of this study was to explore whether the use of iPad technology could assist students with an intellectual disability as they deal with barriers created by their disability in post-secondary education.

The research provides a set of actionable recommendations for embedding the use of iPad technology into future H’art School students’ academic lives.

The H’art School is a registered charitable, non-profit organization in Kingston, Ontario committed to helping adults with intellectual disabilities reach their highest potential through arts and education.

METHOD

Participants: 5 H’art students with an intellectual disability were invited to participate in the study. The invitations were based on recommendations from the H’art School teachers.

Data Collection and Analysis: Qualitative data was collected using observations and interviews. The 5 H’art students were observed with their iPad during their classes both at H’art and Queen’s University. At the end of the term, open-ended interviews took place at H’art School. The interviews were audio recorded, transcribed and analyzed for emergent themes.

FINDINGS

Without exception, all H’art school participants found that the iPad assisted them in their participation in the Inclusive Post-Secondary Education (IPSE) program at Queen’s. Some participants said that they found their semester was more successful at Queen’s than in the past, due to the iPad.

Although organization was not referred to directly, many participants spoke about how they used the calendar application to manage class times, responsibilities and everyday activities. All of the main applications (apps) were used, however, most reported that the use of the Calendar, Safari and Notes apps were most helpful.

The H’art students began to advocate for applications that would meet the demands of the Queen’s Classes as notes by these quotes:

• “I need something that can be used as a separate alarm”
• “opens readings from the teacher.”

Most importantly, the H’art students used the iPads with ease at both H’art school and Queen’s University. For some students, this translated into both an entertainment and academic support tool.

DISCUSSION

A preliminary analysis of the data indicates three emergent themes:

1. The iPad enhances and supports post secondary education for those with an intellectual disability.
2. Basic applications such as the calendar, notes and safari are most effective.
3. H’art students are more engaged and focused with an iPad.

The data shows that all participant’s benefited from the iPad as an assistive technology device. Many commented on how the iPad positively affected their every day life and one participant felt that, “through the iPad I was able to manage my school life.”

REFERENCES


ACKNOWLEDGEMENTS
Partners
Katherine Porter, Executive Director, H’art

Research Assistant
Alyssa Willoughby, MEd Candidate, Queen’s

Studying the iPad as an Assistive Technology Device for Students with Intellectual Disabilities

The purpose of this research study was to explore whether the use of iPad technology could assist students with an intellectual disability as they dealt with barriers created by their disability in post-secondary education. The findings concluded that the students found that (1) the iPad enhanced and supported their organizational and advocacy skills in post-secondary education, (2) the basic applications such as the calendar, Notes, and Safari were the most useful and (3) they were more engaged and focused in class when they had access to an iPad. The research also revealed that students believed they were able to manage their life, time and studies more effectively as a result of the iPad used as assistive technology.

Partners
Dr. Bernadette Dececechi, RMCC
Dr. Tom Dececechi, RMCC

Research Assistant
Michela Ferguson, MEd Candidate, Queen’s

The Learning Styles of Aboriginal Students in the Aboriginal Opportunity Leadership Year (ALOY)

The purpose of this research was to identify learning styles of Aboriginal students and suggest adaptations in the classroom to improve their educational experiences. The study was based on the ALOY students and a control group (non-ALOY students). The results demonstrated that only 41% of the ALOY students were aware of their learning style, whereas 53% of the control group students understood how they learned best. The research also indicated that they ALOY students preferred an auditory learning style in a structured learning environment. Overall, however, there was little significant difference between the two groups. Both groups preferred working alone rather than in groups. The groups described themselves as somewhat reflective and moderately analytical. There remains an academic difference between the two groups—the control group has greater academic success. Future study may include analyzing ALOY students’ study skills and collecting additional data on the way Aboriginal students learn.
Partners
Mary Greenspan, KYAC
Dr. Michael Greenspan, Queen’s
(Electrical and Computing Engineering)

Kingston Youth Arts Cooperative
Margaret Bilow
Heather Zoutman

St. Patrick Catholic School, Kingston
Christian Webster

St. Peter Catholic School, Kingston
Adam Geris

KYAC Instructors
Salar Awan
Caitlin Barton
Michael Gifford
Liam Hunt
Kyle McNeil
Imran Mouna

Queen’s University Work Study
Sheila Hutchinson
Carla Place

SPECIAL THANKS
Carpenter
Wayne Brown

Crossroads United Church
Debbie McCutcheon

Queen’s Con-Ed Students
Alisha Puigmarti
Vivi Shi

Research Assistant
Shireen VanBuskirk, PhD Candidate Queen’s
(Education)

The Kingston Youth Arts Cooperative (KYAC) is a local not for profit grass roots volunteer organization. KYAC’s goal is to create and deliver free arts and science programming to children from ages 6 to 18. This research project explores an outreach program’s use of LEGO® Robotics as a teaching aid to enhance the engagement of elementary school aged children in learning concepts of science, technology, engineering, and mathematics (STEM). The project draws from KYAC’s previous experience over six years of delivering LEGO® Robotics educational modules to elementary schools classes in Kingston, in an outreach format. The goal of the project is to demonstrate that students’ interest in and understanding of STEM concepts can increase through hands-on exposure to LEGO® Robotics. This outreach project will examine how this is true for at-risk youth in underprivileged communities who may not otherwise have exposure to such tools and methods, and who may not have previously demonstrated an interest in STEM subjects. The study will explore how students’ interest, understanding, application, and confidence are influenced by their participation in the hands-on robotics activities. The delivery of this project is a collaborative effort being led by the community organization (KYAC), with support from the Community Outreach Centre at the Faculty of Education, the Faculty of Applied Science, undergraduate Queen’s students, B.Ed. students and one RA Graduate Student. The research question is, Does a LEGO® Robotics activity enhance the engagement of students in learning concepts of science, technology, engineering and mathematics (STEM)?
H’art School is a registered charitable, non-profit organization committed to helping adults with intellectual disabilities (ID) reach their highest potential through arts and education. The research project focused on three teachers and two students with an ID and an impairment in speech production, using high tech, speech-generating devices in the H’art School classroom and community while participating in the 2012-2013 arts-based educational program. Under the supervision of H’art staff and with appropriate support from speech-language pathologists, an RA from the Faculty of Education at Queen’s University will support two H’art students and three teachers in implementing, using and researching the augmentative and alternative communication (AAC) system. They will introduce a program designed to improve communication and interactions with each other and build literacy skills with the use of the AAC technology. Data collection will focus on the effect of training on two student’s communication and literacy skills. The title of the research is, How do teachers and students with intellectual disabilities, who are trained in using an Augmentative and Alternative Communication (AAC) device, communicate in the classroom.

As for the project(s) and Imperial Oil...I am so thankful and would be happy to write them a personal letter. I was moved to tears when Mike (39yrs) responded to my question “How are you?” All these years we would communicate with gestures and very little clarity. Mike used the ipad and swiped by a few pages and entered some directions and told me he was happy......OMG. Katherine Porter, H’art
Kingston Literacy & Skills (KL&S) furthers the development and growth of adult and family language and literacy in Kingston and neighbouring communities. KL&S offers family literacy programs to help and support the development of reading in families, especially in high-risk areas. One of KL&S’ most popular family literacy programs is the Reading and Parents Program (RAPP). The RAPP program loans high-quality children’s books and gives age-appropriate early language and literacy development suggestions (based on the book), related rhymes, poems, crafts and activities. Parents sign up to borrow RAPP packs at specific playgroups. The RAPP facilitator visits these weekly playgroups to loan RAPP packs that are tailor-made for individual families according to the number and ages of children in the household. Since 2000, over 1000 RAPP packs were delivered to families in Kingston, Frontenac and Lennox & Addington counties. KL&S has received many compliments from parents about RAPP: community agencies ask year after year to provide RAPP at their playgroups. This research study will allow KL&S to determine if RAPP encourages parents to provide richer literacy/learning environments in the home and builds confidence in their abilities to help their children learn. Information from this project will be used by KL&S to guide revisions to RAPP if necessary, to help RAPP facilitators understand the issues parents may face when trying to help their children learn and to provide supporting evidence for RAPP program provision when writing grant proposals.

The title of the research is, *Family Literacy Examined: A Case Study Exploring the Outcomes of the Reading and Parents Program (RAPP) offered by Kingston Literacy & Skills (KLS) to Parents and Pre-School Children.*

**Partners**

Deb Nesbitt-Munroe, KL&S  
Anne Jackson, KL&S

Molly Wright, *Ontario Early Years Centre, Kingston*  
Sherry Aylesworth, *Ontario Early Years Centre, Kingston*

Michelle Cole, *Better Beginnings for Kingston Children*

Andrea Lillis, *BEd Teacher Candidate, Queen’s*

**Research Assistant**

Connie Taylor, *PhD Candidate, Queen’s*
Pathways to Education provides four intensive pillars of support to Rideau Heights and Inner Harbour neighbourhoods of Kingston’s north end: academic tutoring; group mentoring which includes career exploration; one-on-one educational coaching and advocacy; and financial support in the form of lunch vouchers, bus tickets and scholarships to post-secondary education. This research study seeks to describe and understand the perceptions and knowledge of post-secondary destinations that are held by students enrolled in the Pathways to Education program. In particular, this study seeks to establish whether the students’ knowledge and perceptions change during the period when they are exposed to activities in the Pathways to Education program that are designed to increase students awareness of post-secondary choices and destinations. We have adopted a mixed method research approach to this study and will undertake quantitative data from questionnaires, and qualitative data from focus groups and in-depth interviews with students in grades 10 and 11 enrolled in the Pathways to Education program during the academic year 2012/13. A T-Test quasi-experimental pre-post design will be used to the questionnaire data, and linear regression using SPSS software will be used to analyze the data. A qualitative method adopting an inductive approach to coding the data will allow for themes to emerge. NVIVO will be employed to assist with the analysis of the interview and focus group data. Findings will be used to determine and create a curriculum of post-secondary exploration that will be congruent with the abilities and interests of the participating Pathways to Education students.

By assessing student’s knowledge and perceptions of post-secondary education, Pathways to Education will be able to customize their programming to help the students achieve the pre-requisites (both academically and socially) that are needed for successful school to post-secondary transition. The research question is, What is the perception of Pathways to Education students of post-secondary educational and other opportunities available to them?

Partners
Wendy Wuyk, Pathways Program Director
Ellyn Clost, Researcher, Pathways
Catherine Lee, Program Facilitator, Pathways

Kingston Community Health Centre

Research Assistant
Lorraine Godden, PhD Candidate, Queen’s
A hallmark of the BEd program at the Faculty of Education, Queen’s University is the Alternate Practicum.

The Alternate Practicum is a three-week opportunity through which teacher candidates can learn about the abundance of opportunities for learning beyond the schoolhouse door.

The Alternate Practicum provides practice teaching placements in informal learning institutions, community organizations, museums, and recreational settings. The goal of the Alternate Practicum is to illuminate the potential of non-school settings for teaching and learning.

The Community Outreach Centre sponsored Alternate Practicum placements for BEd teacher candidates through:

1. Designed Spaces
   Museums and Research Laboratories that are rich in real-world phenomena and provide spaces and resources in which learners can pursue and develop science interests; engage in scientific inquiry; and engage with scientists.

2. Programs for Science Learning
   These programs take place in schools and community-based and science-rich organizations. The goal of such programs is to feed or stimulate the STEM-interests of adults and children and expand participants’ awareness of science career options.

3. STEM through the ARTS
   When STEM meets the ARTs there are opportunities for learners to engage in STEM concepts and confront societal myths and attitudes.

The QCOC supports experiences in informal environments for STEM learning because we believe that such experiences can lead to further inquiry, enjoyment and a sense that STEM learning can be personally relevant and rewarding. We are deeply committed to include learners of all ages, cultural and socioeconomic backgrounds and abilities.

Through collaborations with STEM-focused organizations, local museums, performing artists and musicians, the QCOC has been able to provide opportunities for BEd teacher candidates to develop and deliver curriculum to students and the public; perform a puppet play for over 2000 students; and, entertain at the qualifying round for the provincial Mathematics Olympics.
Mathakazam!

Math is commonly seen as the “bad guy.” When many people hear words like “geometry,” “algebra,” or “stellated dodecahedron,” they swoon and say out loud for all the world to hear: I don’t have the math gene...make it go away!

Through Mathakazam we see math in a different light: in fact, math saves the day!

In Mathakazam we meet Mathew and Mathilda: two children who are a little embarrassed by their mother’s love of all things mathematical. In fact, the other children at school often tease and taunt them about being mathy.

Mathew and Mathilda really, really, really want to be in the school talent show...but the other kids don’t think that math is a talent!

During the planning stages for the talent show, BIG PROBLEMS happen. But Mathew and Mathilda come to the rescue and save the day. It’s a great day for math. Mathakazam!

During the 2012 Alternate Practicum, this team of puppeteers and musicians invoked the powers of Superheroes and Justin Beiber to show that mathematics is all around us, everyday, in useful and beautiful ways.

The QCOC provided free busing to the Upper Canada Academy of the Performing Arts so that some 1381 children (Grades 1 to 3) from the following schools could attend the production of Mathakazam, meet and interact with the puppeteers and learn about unique mathematicians including Snowflake Bentley, DaVinci, Jonathan Swift and (ice dancers) Virtue and Moir.

Schools
Bath P.S.
Centennial P.S.
Elginburg P.S.
Enterprise P.S.
First Avenue P.S.
Glenburnie P.S.
H.H. Langford P.S.
Hinchinbrooke P.S.
Holy Family Catholic School
Holy Name Catholic School
John XXIII Catholic School
Lord Strathcona P.S.
Our Lady of Mount Carmel Catholic School
Perth Road P.S.
Polson Park P.S.
Rideau Heights P.S.
Sharbot Lake P.S.
St. Patrick Catholic School (Harrowsmith)
St. Patrick Catholic School (Kingston)
St. Paul Catholic School
St. Peter Catholic School
Selby P.S.
Storrington P.S.
Sydenham P.S.
The Prince Charles School
Yarker Family School

Community Partners
Annie Milne
Doug Reansbury
Upper Canada Academy of the Performing Arts

BEd Teacher Candidates
Alina Daya
Tasha Latimer
Justine Ma
Natalie Monastero
Jennifer Petey
Jeff Skelhorne-Gross
Gregory Winson
Tank Zawtun
The Community Outreach Centre, Faculty of Education, Queen’s University would like to express appreciation to the following businesses and organizations for supporting the 2nd Annual SCIENCE RENDEZVOUS KINGSTON held on Saturday May 12, 2012 at Grant Hall, Queen’s University. Without their generous support, this important public education event would not have been possible.

SPONSORS

The Imperial Oil Foundation
The Mathematics, Science, Technology Education Group, Queen’s Faculty of Education

CONTRIBUTORS

Campus Book Store, Queen’s University
Delta Printing
Green Centre Canada
LaFarge Cement
Office of the Dean, Faculty of Education, Queen’s University
Society of Graduate & Professional Students, Queen’s University
The Toronto Dominion Bank

DOOR PRIZE

CONTRIBUTORS

Ayva Educational Solutions
Canadian Tire, Kingston Centre
Fort Henry National Historic Site
Kelsey’s Metro, Barrie Street
Marine Museum of the Great Lakes
Novel Idea
Rona
The Keg
2012 Science Rendezvous Kingston Participants

Cataraqui Region Conservation Authority Educators

Dr. Henk Wevers (Professor Emeritus, Queen’s Mechanical Engineering)

Frontenac, Lennox, and Addington Science Fair GreenCentre Canada Kingston Field Naturalists

Let’s Talk Science Little Ray’s Reptile Zoo: Endangered Ontario Matt Ellerbeck (Turtle Conservationist)

Miller Museum of Geology Ontario Provincial Police Prince Edward Point Bird Observatory

Queen’s Centre for Neuroscience Studies

Queen’s Graduate Chemistry Society

Queen’s Solar Design Team

Queen’s Geological Sciences and Engineering Jolliffe Club

Queen’s Child and Adolescent Development Group

Queen’s Department of Chemistry

Queen’s Human Mobility Research Centre

Queen’s Pathology Graduate Students

Queen’s Pharmacology and Toxicology Graduate Students

Queen’s School of Computing

Queen’s Ultrafast Group (Dept. of Physics, Engineering Physics, and Astronomy)

Royal Military College (Departments of Chemistry and Chemical Engineering, & Physics)

Science Quest The Cataraqui Archaeological Research Foundation

The Maclachlan Woodworking Museum

The Pump House Steam Museum in collaboration with Queen’s University Faculty of Engineering and Applied Science
Let’s Talk Science!

Let’s Talk Science (LTS) is an award-winning, national, charitable organization that delivers science learning programs and services that turn children and youth on to science, keep them engaged in learning and develop their potential to become 21st century citizens, innovators and stewards.

The QCOC hired a Let’s Talk Science coordinator to support the planning and delivery of eight elementary science workshops and four intermediate/senior division demonstration lessons to classrooms across the region.

The LTS Coordinators and volunteers worked with four teacher candidates (two Primary/Junior and two Intermediate/Senior) to develop classroom demonstration lessons that spanned the grades and the strands of the Ontario Science curriculum from the study of electricity and living organisms to local ecosystems and fruit forensics.

The in-class workshops and the complementary resource packages available to teachers for follow-up and extensions were made available at no cost to teachers who registered their classes for the program.

This unique Let’s Talk Science/Community Outreach Centre collaboration provided a unique opportunity for local teachers to invite both a science specialist and an early-career teacher into their classroom to conduct curriculum-aligned, hands-on science activities with students.

The QCOC’s trained volunteers were positive role models who used real world examples of science and technology and hands-on/minds-on science activities to bring science to life for students in Grades 2 through to Grade 12.

Let’s Talk Science Coordinators
Audrey Hagar, PhD Candidate
Kathleen Duncan, BEd Candidate

BEd Teacher Candidates
Ian Garrison
Laura Faulds
Adam Gaffney
Jess McAuley

Budding Biologists Workshop
Winston Churchill, P.S. (Grades 1/2)
The Prince Charles School (Grades 2/3 and 3/4)
Ecole Lundy’s Lane (Grades 1/2)

Substances and Mixtures Workshop
Odessa Public School (Grades 7, 7/8)
Loughborough P.S. (Grades 7/8)

Forensic Detective Workshop
North Addington Education Centre (Grade 12)

Forest and Lake Ecosystems in Ontario Workshop
Westdale Park P.S. (Grades 7/8)
J.G. Simcoe P.S. (Grades 5/6)

Understanding Structures & Mechanisms: Pulleys and Gears Workshop
Land O’Lakes P.S. (Grades 4/5, 6/7)

The Classic Egg Drop Competition
Land O’Lakes P.S. (Grades 6/7)
The Prince Charles School (Grades 5/6)
**Mathematical Melodies**

For the second year, a group of teacher candidates had the opportunity to work with local musician Gary Rasberry to compose a suite of children’s songs to complement and supplement the elementary mathematics curriculum.

Over three weeks, the musicians were able to compose 23 songs with titles that include *Skip Counting, Nate the Fraction, The Shapes I Spy, Triangle Point and Time is Telling.*

The songs (in MP3 format), lyrics and teaching notes have been added to the QCOC website resource collection for free download by teachers, parents and community volunteers who work with children.

This particular Alternate Practicum culminated in a performance by the musicians at the Eastern Regional Qualifying Rounds for the Ontario Mathematics Olympics, hosted by the MSTE Group at the Faculty of Education. The audience was captivated by the songs and enthusiastically joined in along with the singers and background musicians.

**Mathematical Melodies Coordinator**
Gary Rasberry, PhD

**BEd Teacher Candidates**
Anna Smol
Melanie Paton
Morgan Evraire
Sara Da Silva
Steven Meece

---

**Triangle Point**
Lyrics by Steven Meece
Sung by Sara Da Silva, Steven Meece & Anna Smol

Triangles they have always three corners
You can measure each one of the three
The corners you see
They have a degree...
The numbers will tell you its name

**Equilateral** triangles
Each corner is sixty
This is it
That’s the end of the calc.
One eighty degrees all triangles are that and sixty’s one eighty cut three equal ways.

Triangle point
Measure it
Triangle point
Measure it

When all of the points all go different ways and the angles just don’t match up
We call that **scalene** and isn’t it strange to see.
The one who insists in matching two corners that triangle it has two the same.
A typical triangle
Like a wedge
Or a pizza
Or a pie
**Isosceles’** the name.
Kingston has 24 museums and historic sites and three art galleries. The QCOC is a regular attendee at meetings of the Kingston Association of Museums, Art Galleries and Historic sites and promotes STEM - and literacy-focused activities at these locations through its website and regular school board e-mail “blasts.”

The Coordinator, Dr. Colgan is a member of The City of Kingston Pump House Steam Museum Advisory Committee and a Consultant for the development of the new Gordon Leitch Discovery Centre.

These collaborations have resulted in rich opportunities for BEd teacher candidates to complete their Alternate Practicum placements with local museum educators. The BEd students have has the opportunity to develop “hands-on, heads-in” activities for Science Rendezvous Kingston to showcase the STEM curriculum illuminated by the museum resources and to develop instructional materials to supplement and complement school visits to the museums, historic sites and art galleries. The BEd students have been involved in teaching March Break camps at these locations and, in some cases, have become docents or instructors for the summer hours during which the museums, historic sites and art galleries are open to the public.

These opportunities are rich learning experiences for the BEd candidates in that they not only have authentic, informal teaching experiences through which they may hone their practice, but learn to reframe STEM ideas and situate STEM concepts in ways that are accessible, inspire positive emotional reactions and communicate the social and personal value of STEM, STEM professionals and STEM careers.
The Royal Military College Outreach Team (RMCOT), is a recently-formed, general Science & Engineering outreach group comprised of Drs. Neda Bavarian, Emily Corcoran, Valerie Langlois and Jennifer Scott, and is led by Dr. Kela Weber. Though not externally funded, RMCOT has the support of the Royal Military College of Canada (RMCC) Dean of Science, and the Department Head of Chemistry and Chemical Engineering.

The RMCOT has collaborated extensively with the QCOC to develop the programs for Science Rendezvous Kingston 2011, 2012 and 2013.

The QCOC has collaborated with RMCOT to develop two NSERC PromoScience grant proposals and the two organizations have worked together to organize placements for Intermediate/Senior Biology, Physics and Chemistry BEd teacher candidates during the Alternate Practica.

Under the supervision of RMCC faculty, BEd teacher candidates have been involved in the development of interactive displays for Science Rendezvous Kingston, posters for peer-reviewed conference presentations as well as curriculum units for enrichment activities for the STEM teaching component of the Royal Canadian Summer Sea Cadet camp at HMCS Ontario.
In 2011, The Community Outreach Centre brought *Science Rendezvous* to Kingston. Researchers from Queen’s, The Royal Military College of Canada, and local museums attracted about 600 people to Duncan MacArthur Hall to learn about everything from Monarch Butterfly migration to oobleck (a non-Newtonian fluid). The day was an enormous success and visitors made it clear that they were hungry for more events that inspired interest in STEM subjects, celebrated the work of scientists, and raised awareness of the myriad possibilities for pursuing STEM-based hobbies and careers within the local community.

By 2012, *Science Rendezvous* had outgrown MacArthur and moved to Grant Hall on Queen’s Main Campus. The Mayor declared Saturday May 12, 2012, *Science Rendezvous Day* in Kingston and the Town Crier, Chris Whyman, read the proclamation during Opening Ceremonies that included greetings from local MP for Kingston and The Islands, Ted Hsu, and local MPP, John Gerretson.

With twice as many presenters, and nearly 200 volunteers, the 1200 visitors to the event had many more opportunities to explore all branches of science and its applications. Visitors, old and young, spent the day meeting some of Ontario’s rare endangered snakes and Snapping Turtles; attending a Chemistry Magic Show; extracting their DNA and dusting for fingerprints; eating ice cream made with liquid nitrogen; and, preparing “silly putty” to take home.

Since *Science Rendezvous* had increased sponsorship for the 2012 event, each family received a tote bag and a *Take Home* book. Each group participating in *Science Rendezvous* contributed a one-page handout so that families could extend the experience of the activity featured at *Science Rendezvous*. By providing families with a simple, yet engaging and safe activity that they can do at home to further explore the concepts that are implicit or explicit in your station, it was intended to make it possible for families to recognize that we are surrounded by science on a daily basis, and that there are resources and activities available to turn the kitchen sink, backyard garden or local pond into a research laboratory. The *Take Home* book was sponsored by the Queen’s Campus Bookstore, established in 1909 by two engineering students who were attempting to offer their peers more reasonably priced supplies than could be found in downtown Kingston. Today, the Bookstore is still owned and operated by students under the auspices of the Queen’s University Engineering Society Services Incorporated (QUESSI).

On the following pages are the official proclamation; lists of sponsors, station coordinators and volunteers; a sample page from the take-home book; and, a photo collage that captures the spirit of the day.
Science Rendezvous Day in Kingston
May 12, 2012

The City of Kingston

PROCLAMATION

Science Rendezvous Day

WHEREAS there is an international decline in the number of students who are pursuing careers in Science, Technology, Engineering and Mathematics (STEM); and

WHEREAS there is a need to encourage children to be curious and aware of STEM related careers, and

WHEREAS there is a need to support teachers, community leaders, parents, and other adult role models to encourage children’s interest in and pursuit of science and engineering-based professions; and

WHEREAS research findings suggest that “particularly in fields like science and technology—the best scenario for learning is one in which, outside the classroom, students remain immersed in curiosity, discovery, and experimentation;” and

WHEREAS Kingston has three post-secondary institutions that have active research programs in science; a number of businesses and industries that are committed to the implementation of scientific research; many local museums dedicated to science; a large number of community organizations dedicated to conservation and ecology; and

WHEREAS the City of Kingston is widely recognized for its efforts in sustainability; and

WHEREAS across Canada the second Saturday in May is dedicated to Science Rendezvous—a day to celebrate and honour science, research, scientists and careers in science;

THEREFORE, I, Mark Gerretsen, do hereby proclaim May 12, 2012, as “Science Rendezvous Day” in the City of Kingston. I encourage all citizens open their eyes and minds to the wonderful world of possibilities that exists by pursuing science studies and considering scientific careers.

DATED at Kingston this 18th day of April, 2012

Mark Gerretsen
Mayor
Cataract Region Conservation Authority Educators
Dr. Henk Wevers (Professor Emeritus, Queen’s Mechanical Engineering)
Frontenac, Lennox, and Addington Science Fair
GreenCentre Canada
Kingston Field Naturalists
Let’s Talk Science
Little Ray’s Reptile Zoo: Endangered Ontario
Matt Ellerbeck (Turtle Conservationist)
Miller Museum of Geology
Ontario Provincial Police
Prince Edward Point Bird Observatory
Queen’s Centre for Neuroscience Studies
Queen’s Graduate Chemistry Society
Queen’s Solar Design Team
Queen’s Geological Sciences and Engineering Jolliffe Club
Queen’s Child and Adolescent Development Group
Queen’s Department of Chemistry
Queen’s Human Mobility Research Centre
Queen’s Pathology Graduate Students
Queen’s Pharmacology and Toxicology Graduate Students
Queen’s School of Computing
Queen’s Ultrafast Group (Dept. of Physics, Engineering Physics, and Astronomy)
Royal Military College (Departments of Chemistry and Chemical Engineering, & Physics)
Science Quest
The Cataract Archaeological Research Foundation
The MacLachlan Woodworking Museum
The Pump House Steam Museum in collaboration with Queen’s University Faculty of Engineering and Applied Science
The Community Outreach Centre, Faculty of Education, Queen’s University would like to express appreciation to the following businesses and organizations for supporting the 2nd Annual SCIENCE RENDEZVOUS KINGSTON held on Saturday May 12, 2012 at Grant Hall, Queen’s University. Without their generous support, this important public education event would not have been possible.

**SPONSORS**
The Imperial Oil Foundation
The Mathematics, Science, Technology Education Group, Queen’s Faculty of Education

**CONTRIBUTORS**
Campus Book Store, Queen’s University
Delta Printing
GreenCentre Canada
LaFarge Cement
Office of the Dean, Faculty of Education, Queen’s University
Society of Graduate & Professional Students, Queen’s University
The Toronto Dominion Bank

**DOOR PRIZE CONTRIBUTORS**
Ayva Educational Solutions
Canadian Tire, Kingston Centre
Fort Henry National Historic Site
Kelsey’s
Metro, Barrie Street
Marine Museum of the Great Lakes
Novel Idea
Rona
The Keg
The Royal Military College of Canada
Neda Bavarian
Brian Campbell
Mackenzie Denyes
Andrea Ellis
Diana Flood
Sharilyn Hoobin
Karen Lee-Waddell
Daniela Loock
Dean Morrow
Michele Parisien
Benjamin Pollack
Susie Rance
Jennifer Scott
Almira Siew
Bob Whitehead
Barbara Zeeb

Ontario Provincial Police
Christine Quenneville

Prince Edward Point Bird Observatory
Peter Fuller

Pump House Steam Museum
Gordon Robinson

Queen’s University
Mark Badham
Mackenzie Bowman
Corrine Hoas
Kasey Hemington
Robin Johannsen
Alison Laidlow
Valerie Kuhlmeier
Jeanne Mulder
Adele Pontone
Joan Willison
Tamas Ungi

Cataraqui Region Conservation Authority
Stana Luxford-Oddie
Matt Ellerbeck

Cataraqui Archaeological Research Foundation
Ashley Mendes

Frontenac, Lennox & Addington Science Fair
David Mitchell

Green Centre Canada
Lisa Doulas

Kingston Field Naturalists
Shirley French

MacLachlan Woodworking Museum
Tom Riddolls
Science Rendezvous Kingston 2012
Volunteers

GREEN CENTRE CANADA
Lyndsey Darling

CATARAQUI REGION CONSERVATION AUTHORITY
Jesse Pelow

CATARAQUI ARCHAEOLOGICAL RESEARCH FOUNDATION
Nadine Kopp

CATARAQUI REGION CONSERVATION AUTHORITY
Jesse Pelow

FRONTENAC LENNOX & ADDINGTON SCIENCE FAIR
Emma Black Berg Ellemers Mitzi Ellemers
Chase Graham Scott Heidi Kristen Hirschfield
Bilal Islam Daniel Levin Jael Moore
Lucy Morrow Abby Serruya Courtney Tulloch

KINGSTON COLLEGIATE & VOCATIONAL INSTITUTE
Adam Copland Jay Jeong John McCrae

KINGSTON FIELD NATURALISTS
Chris Hargreaves Ashley Rudy

NAPANEE DISTRICT HIGH SCHOOL
Jamie Abrams Chelsea Black Madison Henry-Black
John McRae Lindsay Obress Erin Telford

PRINCE EDWARD POINT BIRD OBSERVATORY
Carolyn Barnes Vicki Clowater Rosemary Kent

SPECIAL MENTION
Terry Bridges, Sponsorship & Donations, Facebook/Web Page
Emily LaBine, Developer of the Floorplan & Guide to Science Rendezvous Kingston 2012
Cui (Jessica) Wei, Developer of Science Rendezvous Volunteer Facebook Page
Extract your own DNA!!

You can’t normally see your own DNA but with a few items from around the house you can see those tiny molecules that hold all of the important information that make you so unique!!

What you will need:
** make sure you have the help of an adult!

- 500 millilitres of drinking-water
- 1 tablespoon of cooking salt or table salt
- 1 clear cup or glass
- 125 ml of chilled rubbing alcohol (Isopropyl alcohol USP 70%)
- A few drops of blue food colouring
- 1 eyedropper or 1 spoon
- 1 drop of clear dishwashing detergent
- 1 stir-stick
- Safety Glasses
- 1 pair of rubber gloves

Step 1: Add the salt to the water and stir until the grains of salt have disappeared. Pour 3 tbsp of the salty water into a cup.
Step 2: Gargle and swish all the salty water from the cup around your mouth. Do not swallow the water. Spit it back into the cup.
Step 3: Dip the stir-stick in the drop of dishwashing detergent and gently stir it in the cup 2 to 3 times.
Step 4: Add 2 or 3 drops of food colouring to the rubbing alcohol if you want, and stir well. The blue food colouring will help you distinguish the alcohol from the water.
Step 5: Use the eyedropper to dribble the rubbing alcohol down along the inside wall of the cup. Try to add the alcohol very gently, so that the water and the alcohol do not mix. You want the alcohol to form a separate layer on top of the water.
Pour enough rubbing alcohol to create a 2 cm-high layer on top of the water.
Step 6: Watch the thin strands of DNA collect together in the alcohol. The strands link together and form nets or webs of DNA. If the alcohol is cloudy, try the experiment again and add the alcohol more slowly.
Step 7: Discard the contents of the cup and clean up.

How did this work?
The skin cells inside your mouth were removed by gargling and swishing the water in your mouth. Salty water was used because it acts like the salty fluids inside our bodies.

Our cells are protected by “walls” that are really a fatty layer called a membrane. When you added the drop of dish soap you broke open the cell membrane and the DNA was released into the water.

When the alcohol layer was added, the DNA strands gradually moved into it and joined to other DNA strands. As more and more strands stuck together, the DNA became visible.

W.A.F.F.L.E.S. Community Robotics began in Kingston, Ontario in 2006 with a FIRST LEGO League (FLL) team for 9-14 year olds. Since then W.A.F.F.L.E.S. has grown to include a second FLL team, a Jr. FIRST LEGO League (Jr. FLL) team for 6-9 year olds and a VEX team for high school aged students.

In collaboration with the QCOC, beginning in September 2012, W.A.F.F.L.E.S. undertook its biggest project to date by initiating a community-based FIRST Robotics Competition (FRC) team with students from across the city and the surrounding area. This team is being run as a pilot project for FIRST Robotics Canada as this marks the first time a team in Canada has been established without direct ties to a specific high school.

Over the fall, the secondary school VEX team met at the QCOC and worked with BEd teacher candidates, faculty and staff from the Faculty of Education.

On December 9, 2012, W.A.F.F.L.E.S., in collaboration with the QCOC, hosted the First Lego League Eastern Ontario Provincial Qualifying Competition at Duncan MacArthur Hall, the home of the Queen’s Faculty of Education.

Twelve teams from across the region worked together to create robots that could have real-life application. The theme of the competition was Super Seniors. Students competing had to build a robot that could carry out tasks that the average senior often needs help with: moving large objects and completing reaching and strength tasks.

The W.A.F.F.L.E.S. team won the award for Robot Design.
On March 9, 2013, the W.A.F.F.L.E.S. secondary school team competed at The Greater Toronto East Regionals held at UoIT.

After spending the Fall at the QCOC and the Technological Education Centre at the Faculty of Education, and the Winter at the Community Centre in Amherstview, the W.A.F.F.L.E.S. team successfully completed construction of their robot, Aunt Jemima.

One of 35 teams participating in this qualifying round, the W.A.F.F.L.E.S. robot performed consistently well and encountered only a few glitches, and made it all the way to the semi-finals.

By the end of the competition the W.A.F.F.L.E.S. ended up with three impressive awards: The Highest Seeded Rookie Team, The Rookie All Star Award (which qualifies them for the International Competition in St. Louis, Missouri, April 24-27, 2013) and one individual honour. Kaley Bibic, the student who founded W.A.F.F.L.E.S. was nominated for the Dean’s List for her outstanding commitment and demonstration of FIRST values.

A few days after the W.A.F.F.L.E.S. competed at The Greater Toronto East Regionals, the team made a presentation to the Kingston chapter of the Awesome Foundation. They had 90 seconds to pitch the team to the trustees in a fashion similar to the TV shows “Shark Tank” or “Dragons’ Den,” and then answered questions about the W.A.F.F.L.E.S. project for 7 minutes. The team was awarded a $1,000 cash grant to help pay for event registration fees and some much needed tools. The W.A.F.F.L.E.S. also made some awesome connections—including one that led to a new computer programming mentor for the team!
W.A.F.F.L.E.S. Community Team Members

Bayridge Secondary School
Dean Thompson

Holy Cross Secondary School
Michael Allen
Blake Bentley
Ben Grady
Cole Kennedy
Matt McGlashan
Tara McGlashan

Homeschool
Eden Bibic

Kingston Collegiate and Vocational Institute
Brennan Bibic
Kaley Bibic
Caetlynn de Oliviera

Loyalist Collegiate and Vocational Institute
Philip Brule

Napanee District Secondary School
Rebecca Sweet

Mentors
Greg Allen  Oleg Barnov  Christine Bibic
Goran Bibic  Tim Brown  Margaret Burns
Laurie Gray  Kevin McGlashan  Dan Sweet

B.Ed. Candidates
Brent Dietrich
Jamie Fraser
Serge St. Louis
John Vanvliet
Brian Woodman

Faculty of Education
Ken Ball
Cal Bowry
Nancy Dalgarno

Team Support
Tom Osstrum
Ryan Paquette
The purpose of this study was to explore whether the use of the iPad enhances and supports post secondary education for students with disabilities. In terms of functionality, the iPod Touch, iPhone and iPad offer promising enhancements for students with an intellectual disability. In terms of organization, the Calendar, Safari and Notes apps were most helpful. Although organization was not referred to directly, many participants spoke about how they used the calendar application to manage class times, responsibilities and everyday activities. All of the participants spoke about their experience using the Calendar application to keep track of their daily activities. The data shows that all participants benefited from the use of the Calendar app and Safari browser as well. The use of the Calendar app helped participants to manage their time and plan for the day. The Safari browser provided easy access to information and resources. In terms of accessibility, the participants noted that the iPad offered a new platform for classroom computing (Walter & Baum, 2011). The use of the Calendar app helped participants to plan for the day and manage their responsibilities. The Safari browser allowed participants to access the internet and use online resources. The use of the iPad could assist students with an intellectual disability with their organization and time management. The data shows that all participants benefited from the use of the Calendar app and Safari browser as well. The use of the Calendar app helped participants to plan for the day and manage their responsibilities. The Safari browser allowed participants to access the internet and use online resources. The use of the iPad could assist students with an intellectual disability with their organization and time management.
This budget was based on information provided by Financial Services on Friday March 22, 2013 to reflect expenses and income to March 31, 2013; however, accounts to March 31, 2013 will not be closed until April 15, 2013. This may result in some discrepancies in amounts reported.

<table>
<thead>
<tr>
<th>April 2012-March 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REVENUE</strong></td>
</tr>
<tr>
<td>The Imperial Oil Foundation</td>
</tr>
<tr>
<td>MSTE Contributions (Outreach)</td>
</tr>
<tr>
<td>MSTE Contributions (Science Rendezvous 2012)</td>
</tr>
<tr>
<td>Donations</td>
</tr>
<tr>
<td><strong>TOTAL REVENUE</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>EXPENSES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Rendezvous</td>
</tr>
<tr>
<td>• Event Expenditures</td>
</tr>
<tr>
<td>• Student Assistants</td>
</tr>
<tr>
<td>Community Research Partnerships</td>
</tr>
<tr>
<td>• 7 Funded Projects (2011-2012)</td>
</tr>
<tr>
<td>• 4 Funded Projects (2012-2013)</td>
</tr>
<tr>
<td>• Printing Posters for Conference</td>
</tr>
<tr>
<td>• Poster Conference</td>
</tr>
<tr>
<td>Alternate Practicum Placements</td>
</tr>
<tr>
<td>• Mathakazam (Instructor, Busing, Materials)</td>
</tr>
<tr>
<td>• Mathematical Melodies (Instructor, Materials)</td>
</tr>
<tr>
<td>• <em>Let’s Talk Science</em></td>
</tr>
<tr>
<td>Office Expenses</td>
</tr>
<tr>
<td>Salaries</td>
</tr>
<tr>
<td>• Acting Coordinator (Nancy Dalgarno)</td>
</tr>
<tr>
<td>• Educational Researcher (Nancy Dalgarno)</td>
</tr>
<tr>
<td>• Coordinator (Lynda Colgan)</td>
</tr>
<tr>
<td>• Office Assistant</td>
</tr>
<tr>
<td>• Financial Assistants</td>
</tr>
<tr>
<td>• RAs</td>
</tr>
<tr>
<td><strong>TOTAL EXPENSES</strong></td>
</tr>
</tbody>
</table>
Much of the work of the Community Outreach Centre at the Faculty of Education involves opportunities for local children to learn in formal and informal settings. Our goal is to inspire, support and celebrate children’s interest in science, technology, engineering and mathematics (S.T.E.M.) education.

A primary goal of the QCOC is to convince children that S.T.E.M. subjects are fun, engaging and accessible to everyone. We are particularly concerned about the fact that 50% of girls in grade three report that they do not like S.T.E.M subjects and they are not good at them (in spite of achievement levels to the contrary!)

In light of this statistic, the Community Outreach Centre is sponsoring a design contest to create a positive female role model and S.T.E.M ambassador to display at workshops, seminars, public education events, and courses. We have the blank plywood figure and we invite designs which will give this ambassador a welcoming and encouraging appearance. We hope her presence at the entrance to our various community offerings will help set young participants at ease.

The submissions will be judged by Lynda Colgan, Alison Macaulay (Ministry of Education), Margaret Fler (EQAO), Emma Pavlovic (Grade 3 student, John McCrae P.S., Markham) and Emily Haberer (Grade 1 student, Winston Churchill P.S., Kingston).

The Dean of the Faculty of Education, Dr. Stephen Elliott has requested that Dr. Lynda Colgan (QCOC Coordinator) and Dr. Nancy Dalgarno (QCOC Education Researcher) be guest editors for the May 2013 edition of The Education Letter.

This issue will have articles that focus on informal science, technology, engineering and mathematics (STEM) education; community outreach; public education; parents as partners in teaching and learning STEM curriculum; Arts/STEM connections and possibilities; university-community partnerships; and, shaping the future through STEM.

The list of authors for this issue are: Dr. Steve Abbott, Middlebury College; Dr. Nancy Boyer, Evaluation Manager, For Inspiration And Recognition Of Science And Technology, (FIRST); Dr. Lynda Colgan, Queen’s University; Dr. Nancy Dalgarno, Queen’s University; Dr. Lucie Dumais, Université du Montréal à Québec; Marilyn Fenichel, co-author of Surrounded by Science: Learning Science in Informal Environments (National Academies Press); The Honorable Gary Goodyear, Minister of State (Science and Technology); Alexandra Penn, Durham College; Susan Ramsay, Early Literacy Specialist, Kingston Literacy and Skills; αvδ, Dr. Joe Schwarcz, Director, Office for Science and Society, McGill University.
Science Rendezvous Kingston 2013 will be held at the K-ROCK Centre in the heart of downtown Kingston on Saturday May 11, 2013. The K-ROCK CENTRE will be transformed into a giant Science Discovery Centre! Where families and members of the public can meet and talk to scientists, engage in scientific experiments and learn about the excitement and possibilities of science, technology, engineering and mathematics.

With over 50 Departments, Centres, Organizations participating, there is something for everyone: robots, cockroaches, surgical simulations, salamanders, fingerprinting stations, accident reconstructions, birds, solar cars, face painting, balloon sculpting, and ice cream!

The QCOC is part of a nation-wide group that together is the Science Rendezvous team. The Science Rendezvous initiative is a public platform to promote science awareness and increase science literacy in Canada. Science Rendezvous informs. It works to engage and transform the general public from passive supporters of science and engineering to active, passionate champions with an understanding of the important role science plays in our rapidly changing world.

Science Rendezvous is designed to bring science, and world-leading scientists, face-to-face with the public! Science Rendezvous demonstrates how science affects our daily lives, standard of living, and global competitiveness. By opening the doors of over $5 billion in science infrastructure to allow unprecedented public access to state of the art laboratories and research facilities, Science Rendezvous offers a behind the scenes look into the every day world of Canadian scientists, and encourages youth to consider a science-related career or study path.

Most importantly, Science Rendezvous makes science fun again! We believe that science and scientific research should be an ends in and of itself, rather than a filter function for unrelated careers.


FIRST Robotics Canada (FRC) has been seeking a University partner in Ontario to support and advance its work in Science, Technology, Engineering and Mathematics education.

FRC has been impressed by the work of the Queen’s Faculty of Education Community Outreach Centre (QCOC) to support the very first community robotics team in Canada (WA.F.F.L.E.S) and The First Lego League (FLL, ages 9 to 14) at two local schools (SmARTs). The teams have been mentored by BEd teacher candidates and supported by Faculty and Staff in Technology Education.

FRC has funding from both federal and provincial sources, and would cover all expenses for the start-up of teams in the local area.

FRC is interested in partnering with the QCOC to achieve the following goals:

1. Start new FLL teams with mentorship from BEd students.
2. Assist with research and help to plant FLL teams in At Risk areas of Kingston.
3. Host the FLL tournament (as we did in December 2012).
4. Provide expertise and resources in the area of data tracking of FIRST students.
5. Coordinate all of FIRST’s efforts at Queens through the Outreach Centre.
6. Combine grant writing efforts to highlight the FIRST and the Outreach Centre.

The meeting will feature three 10 minute presentations: (1) Lynda Colgan, Coordinator, Community Outreach Centre, Why STEM Education Matters; Mark Breadner, Executive Director, FIRST Canada, Engaging children in playful and meaningful learning while helping them discover the fun in science and technology; and, Kaley Bibic, Team Member, Learning Science, Technology and Math in Informal Environments: The W.A.F.F.L.E.S Pilot Project.
Next Steps

Knowledge Mobilization

In 2012-2013, the QCOC completed three, 2-year studies that examined our flagship initiatives: STEM Outreach, Alternate Practica and Community Research Partnerships.

In May and June, 2013, Dr. Lynda Colgan and Dr. Nancy Dalgarno and one of the QCOC Research Assistants, Connie Taylor (PhD candidate) will be presenting the following paper and poster sessions at CSSE (The Canadian Society for Studies in Education) and CU (Community University) Expo.


Next Steps

Knowledge Mobilization

To further turn our research about the QCOC’s activities into action, the following papers are in preparation for publication:

Colgan, L. E. C. (Editor). (May 2013). The Education Letter, Faculty of Education, Queen’s University.


These academic publications will supplement and complement the distribution of QCOC resources at professional learning conferences for parents and educators supported by The Education, Quality and Accountability Office, The Hastings Prince Edward Board of Education, The Algonquin and Lakeshore Catholic District School Board, The Western Ontario Association of Mathematics Education and The Museum of Science and Technology.
TABLE OF CONTENTS

SECTION 1: Community Research Partnerships

Introduction 4
2011-2012 Research Partnership Summary of Findings

Kingston Literacy and Skills 5
Hastings & Prince Edward District School Board 6
Let's Talk Science 6
Kingston Literacy and Skills 7
Big Brothers, Big Sisters 7
H'art School Poster 8
H'art School 9
Royal Military College of Canada 9

2012-2013 Community Research Partnerships

Kingston Youth Arts Cooperative 10
H'art School 11
Kingston Literacy & Skills 12
Pathways to Education 13

SECTION 2: Alternate Practica

Introduction 14
Mathakazam! 15
Photo Collage 16
Let's Talk Science 18
Mathematical Melodies 19
Museums 20
The Royal Military College of Canada 21

SECTION 3: STEM Outreach Activities

Science Rendezvous Kingston 2012
Introduction 22
Proclamation 23
Participants 24
Sponsors 25
Station Coordinators 26
Volunteers 27

Sample Page from Take-Home Book 29
W.A.F.F.L.E.S. Community Robotics Team 30
What is W.A.F.F.L.E.S.? 30
W.A.F.F.L.E.S. Activities 31
W.A.F.F.L.E.S. Team 32
W.A.F.F.L.E.S. Photos 33

SECTION 4: BUDGET

Financial Statement 34

SECTION 5: NEXT STEPS

STEM Ambassador Contest 35
The Education Letter 35
Science Rendezvous 2013 36
FIRST Robotics Partnership 36
Knowledge Mobilization: Conference Presentations 37
Knowledge Mobilization: Papers 37
SCIENCE RENDEZVOUS PHOTO COLLAGE 38-39
The goal of the Queen's Community Outreach Centre (QCOC) is to improve the outcomes for children and youth who are "at risk" and by so doing, impact learning and learners of all ages. Through partnerships; divisions; and collaborations, QCOC will expand the YSC’s educational offerings for students and families. With support from the RMCC (RCTC), the Queen’s University College of Engineering (QCOC) and other like-minded organizations, QCOC will lead the way in expanding the YSC’s educational offerings for students and families. Through partnerships; divisions; and collaborations, QCOC will expand the YSC’s educational offerings for students and families. With support from the RMCC (RCTC), the Queen’s University College of Engineering (QCOC) and other like-minded organizations, QCOC will lead the way in expanding the YSC’s educational offerings for students and families.
For more information or to request additional copies of this report, contact

The Community Outreach Centre
Queen’s University
Faculty of Education
Duncan McArthur Hall A363
511 Union Street
Kingston, Ontario K7M 5R7
community.outreach@queensu.ca
613-533-6000 X 75775