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**Dedicated to Improving  
Mathematics, Science and  
Technology  
Education through:**

- Teacher support
- Enhanced employability
- Curriculum development
- Applied R&D
- Assessment
- Partnerships

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## **Our New Identity Reflects Our Commitment to Mathematics!**

It has been a while since our last issue of “News” and we are pleased to report that we have new projects and opportunities underway. You’ll note our new name and identity: the York Seneca Institute for Mathematics, Science and Technology Education. The inclusion of mathematics in our name and logo is a reflection of the commitment we have to supporting the teaching profession in all aspects of science and technology.

We’ll be undertaking projects specifically around issues of importance to educators from elementary to postsecondary, including student achievement, the impact of the new curriculum and recent media coverage of student preparedness for post secondary programs.

YSIMSTE has recruited a number of experienced faculty from both York University and Seneca College to support these initiatives. Please contact us if you are interested in participating.

## **We’ve Moved!**

It was a busy summer for the YSIMSTE team, as we moved our office from the Stephen E. Quinlan building at Seneca @ York to the new TEL (Technology Enhanced Learning) building, located just next door. We are located on the third floor, in room 3150.

We are now settled in our new digs and the official opening for the building is planned for January 20, 2004.

## **Summer Science and Technology Project**

The 2003 York/Seneca Summer Science and Technology Project was an unqualified success in providing students with opportunities to improve their confidence and competency in workplace and interpersonal skills. Students learned about employment and opportunities in the fields of science and technology and gained an understanding of the realities of workplace responsibilities. Ultimately, the message embedded in this year's program was of the importance of initiative and communication skills in developing positive work ethics and interpersonal relationships, which are necessary in whatever discipline the students choose to pursue. Positive and constructive comments made by supervisors, of the students who were placed with them and of the Project itself, reinforce the importance of continuing to provide young people with opportunities to learn, to grow, and to expand their expectations of themselves. The York/Seneca Summer Science and Technology Project aims to do just that, and it is heartening to note the success of student participants and the continued involvement of many placement supervisors in the program.

The York/Seneca Summer Science and Technology Project is projected to expand its outreach to include an annual target of 36 students, and to initiate partnerships with private sector institutions, such as hospital laboratories and corporate facilities, to create additional placements. The Project will strengthen and expand student access to resources at York University and Seneca College, such as recreation centres, career and resource centres, liaison offices, libraries, and computer labs. In addition, the Project will create additional contacts with community organizations to provide guest speakers, workshops, and resources to enhance the co-operative education credit requirements.

The 2003 Summer Science and Technology Project was supported by the Ministry of Economic Development, Trade and Technology and the following foundations: Donner Foundation, S.M. Blair Family Foundation, Acapella Foundation, Lloyd Carr-Harris Foundation and Suncor Energy Foundation.

## **Promoting Integrated Learning (PIL): Literacy and Numeracy through Science and Technology**

Over the last 6 months, YSIMSTE launched this project with 14 partner district school boards and one professional association\* to support teachers in addressing emerging classroom needs and Ministry initiatives (i.e., Ministry of Education Early Math Strategy, Early Reading Strategy).

The purpose of this program was to support the design, development and delivery of an integrated curriculum in Grades 1-8, based on science and technology as a vehicle for achieving literacy and numeracy, through professional development for teachers and classroom resources for students.

Phase 1 of the project promoted integrated learning through developing in-service programs for teachers to help them see the connections and relationships among ideas, people and issues in the real world. The ability to see the links among areas of learning will enable students to use the knowledge and skills developed in one subject area to learn in another, and to relate their learning to real-life situations.

PIL is structured as three series, each comprising 3 x 5-hour mini-courses, tailored to each division (Primary, Junior, and Intermediate):

1. Literacy through Integrated Learning (P, J, I)
2. Numeracy through Integrated Learning (P, J, I)
3. Planning for Program Integration (P, J, I)

As of September, 2003 a master CD-ROM with these 9 teacher in-service modules was sent to each partner group.

Phase 2, consisting of the delivery of the teacher in-service sessions to partner boards, began this Fall and will continue throughout the school year.

**\*Partner School Boards:** Rainbow DSB, Simcoe County DSB, Toronto DSB, Toronto Catholic DSB, DSB of Niagara, Durham DSB, Waterloo DSB, York Catholic DSB, Peterborough/Victoria/Northumberland/Clarington DSB, Limestone DSB, Halton DSB, Dufferin-Peel CDSB.

**Partner Association:** Ontario Association of Certified Technicians and Technologists

## **Biotechnology Stem Cells Resource for Teachers**

YSIMSTE has been involved with the Canadian Biotechnology Education Resource Centre over the last year, having recently completed Canada wide field testing of a new biotechnology teaching resource. YSIMSTE staff produced a teacher's guide, complete with curriculum correlation, so that teachers from St. John's to Victoria can make use of this resource.

The ENGAGE: Stem Cells package is offered free to teachers across Canada by the University of Toronto Joint Centre for Bioethics and Genome Canada. Targeted for Grades 9-12 (depending on provincial curriculum documents), the classroom-ready resource consists of 3-5 class sessions that explore the ethical implications of stem cell research as an example of a controversial new technology. The resource is complete with all necessary teaching materials and is available in electronic and paper copy through <http://www.stemcellnetwork.ca>.

YSIMSTE has launched this resource package to groups of teachers in Halifax, Winnipeg, and Toronto. Comments to date from students are as follows:

"There was no winner or loser in the discussions."

"Our teacher encouraged us to respond to the ideas of others. We didn't want to stop!"

"We learned that real science is not black and white."

"I was able to share my perspective on the issue and respected other students who did not agree."

"I learned why politicians sometimes have difficulty making a decision. It's not easy when many perspectives can influence a science-related decision in society."

### **Rock-it-Science Bus**

The York/Seneca Institute for Mathematics, Science and Technology Education (YSIMSTE) has been contracted by the Canadian Biotechnology Education Research Centre (CBERC) to develop biotechnology-based program materials for Ontario's new Rock-it Science Bus that will bring cutting-edge science and technology to budding young scientists across Ontario.

The self-contained specially built bus will provide grades 7 to 9 students with the opportunity to use scientific equipment not typically found in school labs.

YSIMSTE faculty members Graham Orpwood and Ray Bowers will manage the development project which will be carried out by a team of four teachers from Grades 7, 8 and 9 and three faculty members from Seneca's School of Biological Sciences and Applied Chemistry. The materials will be based on the Ontario Curriculum in Science and Technology and build on the YSIMSTE experience in the Assessment of Science and Technology Achievement project (ASAP).

For more information about the Rock-it Science Bus project, visit [www.ontsciencebus.org](http://www.ontsciencebus.org).

### **Biotechnology Laboratory Course for Teachers**

Seneca's School of Biological Sciences and Applied Chemistry, in conjunction with the Canadian Biotechnology Educational Centre (CBERC) hosted a three day workshop for secondary school teachers at the end of August at the Seneca@York Campus.

The workshop was designed and run by Seneca faculty Drs. Michael Gadsden and Alison Symington to fit the grade 12 biotechnology curriculum. This workshop allowed the teachers the opportunity to become familiar with and practice

biotechnology laboratory techniques. The intent is to ensure that the teachers will feel comfortable with the laboratory techniques within their own classroom.

The teachers had the opportunity to isolate and manipulate DNA. They also became proficient in the areas of electrophoresis and PCR as well as participated in discussions concerning biotechnology, bioethics and the grade 12 biotechnology curriculum.

## **Secondary School Technology Teachers participate in Seneca's Applied Research Project!**

Phase 4 of the CFI/OIT funded project titled, "The development and evaluation of the effectiveness of interactive Internet-based teacher in-service education for teaching broad based technology curricula in Ontario Secondary Schools Grades 10-12" is almost complete and is a huge success! The curriculum and learning processes for this phase were revised significantly based on the input of the teachers who participated in the earlier phases of the project.

We currently have 10 secondary school teachers from across the province working through the on-line curriculum and engaging in ongoing lively asynchronous and synchronous discussions related to their curricula and their students and facilitated by Seneca's Valerie Lopes. The participating teachers share innovative ways of facilitating student learning in the broad based technologies within Ministry guidelines. The online environment has proven to be an effective means to encourage collaboration. Invited guest experts add to the value of these discussions.

Feedback from the participants has been very positive and they have requested to continue their discussions when this phase of the project ends in December. Their evaluative feedback is providing some interesting data for our research on the use of interactive internet-based in-service teacher education.

## **STAO Conference 2003**

Once again, YSIMSTE participated at the annual conference of the Science Teachers' Association of Ontario. We were delighted to see some many familiar and not so familiar faces stop by our booth and those of our sponsoring institutions. Despite the weather, organizers reported a good turnout.

Dr. Graham Orpwood presented a session entitled "Assessment in Science: Ontario in an International Context", which provided an opportunity for participants to dialogue about assessment models at home and abroad.

Ray Bowers presented sessions on the ASAP project, the Stem Cells Resource package and Promoting Integrated Learning (PIL). The ASAP (Assessment of Science

Achievement Project) session, introduced the audience to sixteen sets of exemplars for science and technology for Grades 1 - 8 in a multimedia, web based format. The session on the ENGAGE: Stem Cells package introduced teachers to this free resource, which has been developed for Grades 9-12. The Promoting Integrated Learning (PIL) session introduced teachers to the design, development, and delivery of an integrated program in Grades 1 through 8, with a focus on science and technology as a vehicle for achieving literacy and numeracy.

Drs. Michael Gadsden, James Humphreys and Alison Symington of Seneca's School of Biological Sciences and Applied Chemistry presented a hands on biotechnology workshop, aimed at supporting the molecular biology related topics in the Grade 11 and 12 biology curriculum. The session allowed participants to explore technical and societal biotechnology issues and learn a multi-faceted experimental approach to teaching biotechniques.

Dr. Gillian Wu, Dean, Faculty of Pure and Applied Science at York University presented a keynote address entitled "Perspectives on Science: The Genomic Years – are we immune yet?" at the conference.

### **York Region Science Fair**

The Seneca team at YSIMSTE was pleased to assist two very resourceful and enthusiastic young men to re-launch the York Region Science Fair after a 8 year hiatus. The fair, held in April 2003, was the culmination of several months of planning on the part of the organizing team. Students from the York Catholic District School Board, York Region District School Board, and the Association of Independent Schools in York Region submitted projects ranging from technology to pure science. Four students were selected to represent the region at the Canada Wide Science Fair, held in Calgary last May.

The York Region Science Fair 2004 has been renamed as the York Region Sci-Tech 2004 and will be held April 3, 2004 at the Stephen Quinlan Building, Seneca@York Campus. Please visit <http://yrstf.senecac.on.ca/> for more information on the fair, including registration and contacts.