

### PromoScience Project

Our initiative promotes science to elementary students (P-6) and their teachers through the development of science units. The project focuses on elementary education to instil interest in science at an early age. It is estimated that more than 90% of elementary teachers have their Bachelor's degree in a discipline other than science and have little science background, and we want to provide support.

Our units are collaboratively developed by CBU science and education faculty, and school teachers to provide P-6 teachers with effective tools to enhance their science curriculum. The kits contain indoor and outdoor activities and resources – supported through a website and access to university expertise – that are locally-relevant, grade-appropriate, customizable and easy to use.

### Background

The Nova Scotia curriculum guides are a developed resource for teachers with a primary focus on classroom activities. In this pilot project, we focused on outdoor activities for Grade 5 students that connect to their science curriculum. We hypothesize that students are more focused being outside, helping them to understand the assigned units. In addition, with a pre-prepared and detailed lesson plan, teachers will be more comfortable taking their students outside the classroom to local green spaces (schoolyard or nearby park).

We crafted a unit plan that both honours the Grade 5 science curriculum and provides teachers with the tools they need to bring students out into the world to practice hands-on learning. Our units are developed in an iterative way, i.e. we are field testing the units ensure that we bring tested, workable units to Nova Scotian teachers.

#### Baile Ard Nature Trail

The Baile Ard Nature Trail is a 70 acre forested nature area with 3 km of walking trails, centrally located in Sydney. We connected with a group of active and retired teachers, who are involved with the Baile Ard Recreation Association, and took the opportunity to use the trails for science learning.



Our ambitious first pilot involved approximately 70 Grade 5 students, ten Grade 9 student assistants, three classroom teachers and four members of our team. There were two topics being presented: our weather unit along with physics unit for simple machines (separately developed by retired teacher, David Gabriel). The Grade 5 students were put into groups of 5 or 6 and given about 90 min to complete the 5-station circuit, of which we ran two parallel circuits to deal with the large number of students.

### Field Testing, or How did it go?

Our unit is designed with informative pre-lessons that introduce the topic of weather from a variety of perspectives. We recommend compiling a running vocabulary of important terms that emerge throughout the unit.

We have made use of technology with links to weather songs and scientifically sound "Bill Nye, the Science Guy" and other videos. Questions sheets have also been included to make these resources more meaningful.

Central to the weather unit, are lessons during which students build and use their own weather measuring devices, using simple materials like ping pong balls and milk cartons. These devices could be used in the field test.

Our lessons are intended to reach a variety of learning styles and to honour the principals of multiple intelligence pedagogy. In addition, for each lesson, we have included potential links to language arts, social studies and math outcomes.

The key to a successful field trip is **PREPARATION** of both students and teachers. The required weather lessons must be covered in class prior to outdoor activities; students need to know what they are doing and why in order to get a great learning experience.



**Grade 5 Students' Perspective:** Students loved being outside! We observed both cooperation and engagement at our weather stations.

**Grade 9 Student Assistants' Perspective:** Assistants should be prepared prior to the field. Activities went more smoothly with each successive group, as level of comfort and confidence increased.



**Scientist's Perspective:** The unit is sound, yet more time, a more focused field test, or wider spread test locations should be used to produce more varied results. Quality digging materials are key, as well. These items will be addressed in future improvements.



### Conclusions and Going Forward

#### Conclusions:

Initial testing was a great success! We will do it again in October 2014.

- One of the leading barriers of teachers to taking students outside is the overly exaggerated fear of injury - no children were harmed during the activities
- Ongoing re-evaluation/strengthening of weather-based field activity
- Make space and time for reflection and to bring in the arts
- Simplify; Inter-grade interaction is great, but logistically difficult; have 3 grades spaced apart for spiral learning array; Investigating working with high school PAL students.

#### Future:

- Development of a Grade 4 Life, Earth and Space Sciences kit
- Collaborative work with elementary teachers who are interested in developing Science kits
- Investigating the possibility of creating a science kit focusing on Aboriginal herb lore and medicinal knowledge in the future.

### About the Team

This 3-year PromoScience project is led by a team CBU faculty: **Katherine Jones** (Biology), **Matthias Bierenstiel** (Chemistry), **Coleen Moore-Hayes** (Education) and **Maureen Finlayson** (Education). The project has evolved from similar interests of the applicants and outreach initiatives such as *Project UFO* (Unidentified Foreign Organisms) and the *Research Awareness in Chemistry Education* program.



**Anju Virick** has BACS and BEd degrees from Cape Breton University. Teaching yoga for over 15 years has taught her the importance of integrating body and mind in every learning experience. She sees science literacy necessary for creating responsible global citizens.

**Megan MacLeod** graduated from Cape Breton University with BSc (Biology) and BEd degrees. She has a strong passion for teaching promoting inquiry-based, hands-on science as the best kind of science learning.



### Acknowledgements

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