McGill Physics Space Explorers Program: Final report

The McGill Space Explorers program (formerly *Adopt an Astronomer*) has become an established program in the community. We have a steady partnership with several local primary schools, with a focus on under-resourced schools. Pairs of volunteers from the physics department visit classrooms (grades 4-6, ages 9-12) on average 5 times over the course of the school year. During these visits, the students are treated as astronauts in training, and learn the fundamental physics concepts necessary to complete their mission. To end the year, we co-host a workshop on inquiry-based science education, the *Inquiry Institute*, in partnership with the Lester B. Pearson school board. This workshop allows a greater number of teachers to participate, learning the importance of inquiry-based learning for their students, and getting a chance to do science activities presented by our volunteers. The teachers will then be able to bring these ideas back into their classroom. We also invited volunteers from BrainReach (neuroscience outreach group at McGill) to provide a more enriching program for the teachers.

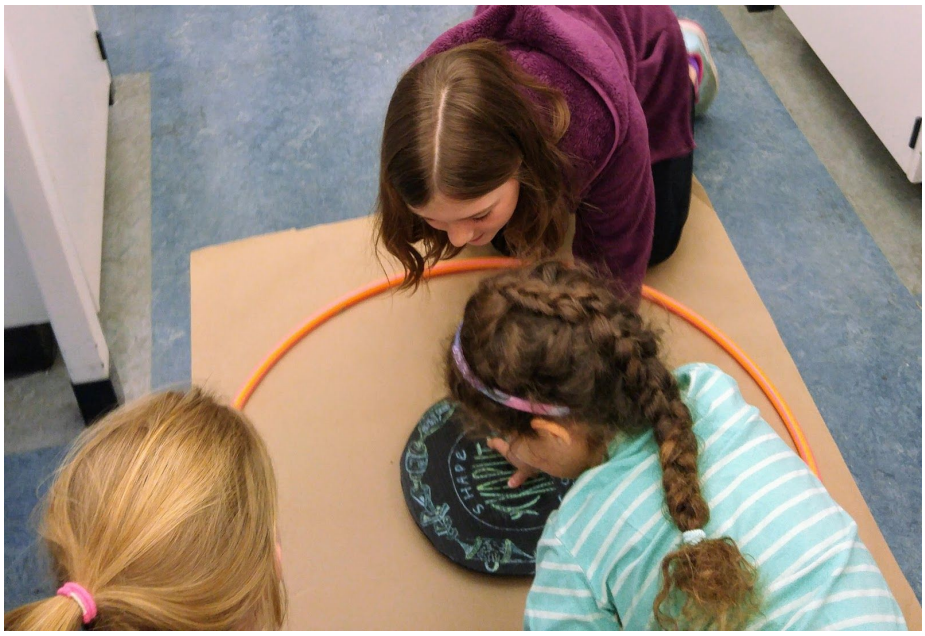
This year, we created two new modules, one on circuits and electricity, and one on forces and friction. Both modules will be deployed in primary schools starting in the fall. With the inclusion of these two modules, we now have 7 modules, allowing us to better adapt to different age groups and levels. Over the next year, we plan to add an 8th module about pressure and volume, which is currently under development. Although teachers are all very enthusiastic about the program, some of the classrooms have mixed ages (e.g. grades 4-5 together.) In these classrooms, it is common that the teacher prefers not to repeat the activities in consecutive years, since half the students have already seen the modules. The addition of these extra modules plus 2 more in the next 1-2 years will allow us to go into these classrooms in consecutive years.

Summary of activities

- Over the 2016-2017 academic year, volunteers visited 7 classrooms in 4 schools, reaching a total of 126 students. In 5 classrooms, the activities were taught in French, and in 2 classrooms, the activities were taught in English. Similar numbers of classrooms and students were reached in previous years, and are planned for the upcoming year.
- We created a new module on forces and friction. This module was presented at the workshop for teachers. Feedback from the teachers indicated that are very likely to create a similar module for use in their classrooms.
- We created a new module on electrical circuits. This was presented to a group of students at a summer camp. Feedback from the summer camp leaders will be

incorporated to improve the module for deployment in the primary schools in the upcoming year.

- We made improvements to the *Collisions* module to make the materials more durable.
- We started development of an activity about pressure and volume. In the upcoming months we will revise the pedagogy in order to complete the module.
- 22 primary school teachers from the Lester B. Pearson school board attended the Inquiry Institute workshop for teachers this year. Each of these teachers will impact hundreds of students throughout their tenure.



Students doing the *Collisions* module.

Students doing the *Circuits* module.

Teachers doing the *Forces and Friction* module at the Inquiry Institute workshop for teachers.

Teachers analyzing temperature data to learn about the reason for the seasons at the Inquiry Institute workshop for teachers.