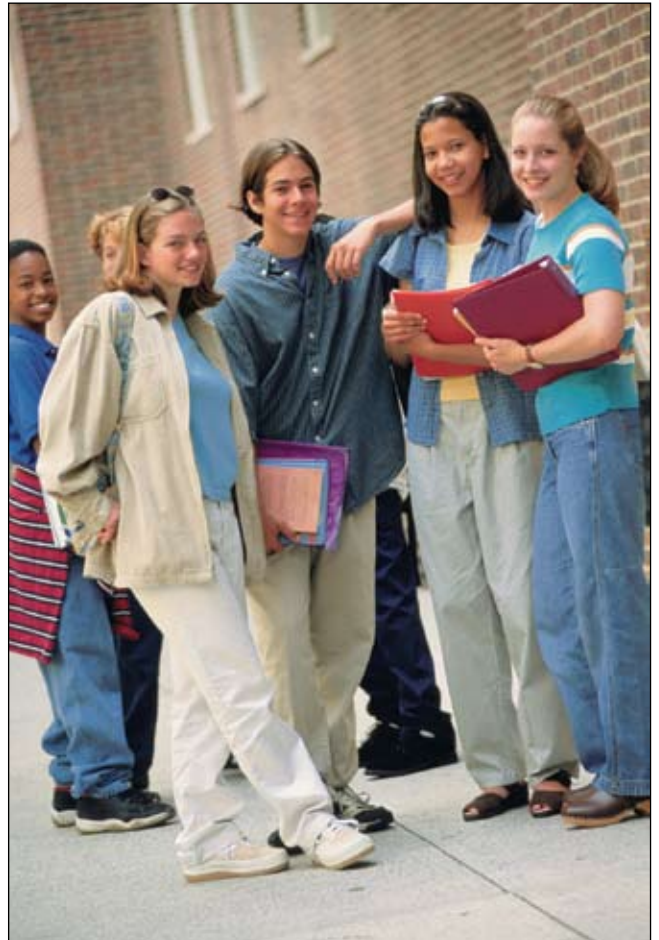
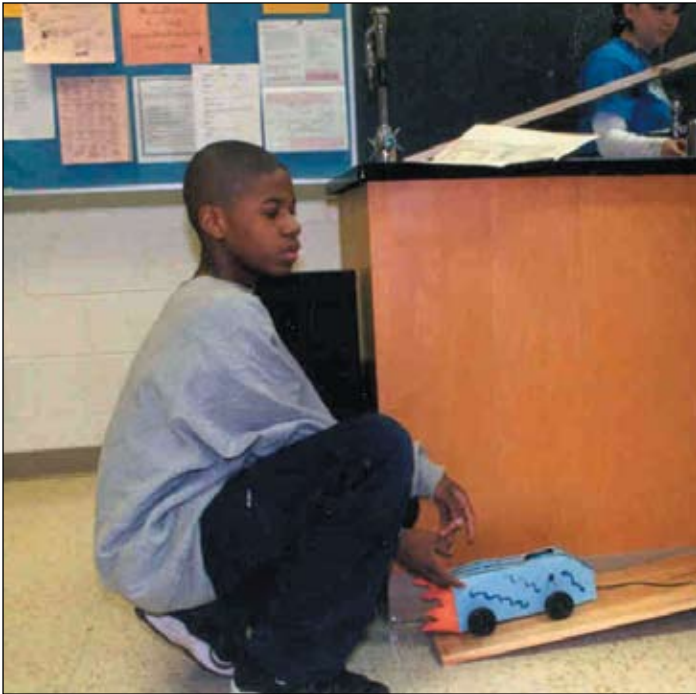


SAE 
FOUNDATION CANADA
for Science and Technology Education



A World in Motion: an Educational Partnership Offered by the Society of Automotive Engineers

“The phenomenal scientific and technological changes that we are experiencing offer opportunities for young Canadians as never before. Consequently, science education takes on an unprecedented importance.”

Honourable Glenn Hagel,
Minister of Post-Secondary Education
and Skills Training

Introduction to *A World in Motion*

Addressing the Needs of Our Future

In order for Canada to have the skilled workforce it needs in the next decade, elementary and secondary students must remain excited about mathematics and science in preparation for advanced study and later technical and professional careers.

To stimulate that excitement, the Society of Automotive Engineers (SAE) Foundation Canada, through its *A World in Motion* program, has designed and produced innovative, "hands on" curriculum supplements that teach basic physical science and mathematics concepts.

A World in Motion participating companies have enabled SAE to develop and disseminate these educational programs; however, additional support is needed to expand the programs throughout Canada.





The Challenge

The Status of Canadian Education

In North America, the outlook for recruiting and educating young people for careers in engineering and science and other technical fields is at best challenging. Numerous studies indicate that while Canadian students are performing at the international average in mathematics and science, fewer students are choosing to pursue careers in fields such as engineering; and young women and minorities are still under-represented in technical fields.

In 1999, a joint project was undertaken by Statistics Canada and the Council of Ministers of Education, Canada (CMEC) to evaluate the education systems in Canada. This project, the "Report of the Pan-Canadian Education Indicators Program" compares the educational achievements of Canadian children with those of other countries worldwide.

1999 Pan-Canadian Education Indicators Program Results	
Performance of Canadian students as compared to those of other countries	
Grade Level/Subject	Canada's Ranking
Grade 4 Mathematics	8th (behind U.S.) with 60% of answers correct
Grade 4 Science	6th (behind U.S.) with 64% of answers correct
Grade 8 Mathematics	10th with 59% of answers correct
Grade 8 Science	8th with 59% of answers correct

While Canadian students are academically performing at an average to slightly above average level with their international counterparts, there has been an increase of less than 1 percent in the number of degrees awarded in engineering and applied sciences between 1987 and 1997.

This increase, however minimal, is important to sustain and grow in an effort to meet Canada's future labor needs. Continued efforts must be made to maintain students' interest in math and science that will ultimately affect post-secondary educational choices and careers.

The Impact on Corporate Canada

In order for Canada to remain competitive, we need a steady pool of competent, quality employees. The average performance of our young people in the areas of math and science needs to improve as does the number of women and minorities in engineering schools in order to avoid troubling implications for our future.

As business leaders, we must get involved. A critical element in achieving improvement in mathematics and science education is joining forces – as employers, educators and community members – and applying mathematics and science to “real world” problems. SAE’s educational programs provide the means for companies to do just that.



“Bombardier Aerospace Toronto is committed to our community. A World In Motion is helping us achieve our commitment to the community and its children.”

Marc R. Parent
Vice President/General Manager
U.S. Operations
Bombardier Aerospace/Learjet



Where are the Young Engineers?

Student disinterest in mathematics and science is already being felt. According to the Center for Education Statistics, Statistics Canada, there has been an increase of less than 1 percent in the number of engineering and applied sciences degrees awarded between 1987 and 1997. However, the number of overall students receiving university degrees increased 33 percent.

Without a strong background in these areas and ample encouragement, few students are studying engineering at the university level – and Canadian companies are struggling to fill entry-level engineering positions with a steadily decreasing pool of applicants.

Experts agree that we will not be able to increase the number of engineering graduates by simply developing programs for high school or university students. Instead, it is critical that we reach our children during their early years to encourage them to develop an affinity for mathematics and science.

Engineering Degrees Awarded in Canada Compared to Total Degrees		
Year	Engineering and Applied Science Degrees Awarded in Canada and Provinces	Total Degrees Awarded in Canada And Provinces
1987	11,344	140,666
1997	12,798	173,841
<i>Source: Center for Education Statistics, Statistics Canada</i>		

SAE Resources

Member Support

The more than 80,000 members of SAE have demonstrated their desire to become involved in issues of public importance. SAE's student members have also made a commitment to engineering education and are represented on 34 campuses in Canada. In addition, numerous faculty members are involved with SAE as members, advisors, authors and committee members.

Educational Relations

On staff at SAE, a team of education professionals reviews and distributes SAE educational materials, works with teachers and engineers, and actively promotes SAE's educational programs.

The SAE Foundation Canada

The purpose of the Foundation is to raise and administer funds for Canadian educational activities in Canada, including *A World in Motion*, the Collegiate Design competitions and undergraduate engineering scholarships.





SAE Educational Programs

A World in Motion Challenge 1

Produced in 1990 and revised in 1999, this program for Grades 4 - 6 emphasizes hands-on discovery of science principles in a cooperative learning setting. *A World in Motion Challenge 1* awakens in children a sense of wonder and excitement about the world in which they live. With the help of a volunteer engineer or scientist, student engineering design teams build a regatta skimmer, jet toy or steel-can rover.

A World in Motion Challenge 1 is the largest and most comprehensive private initiative in North America designed to support science education in elementary schools. In fact, more than 35,000 of these educational kits have been distributed. An evaluation conducted by Goodman Research Group, Inc. in 1998 revealed that teachers really liked this program. They expressed special attention for the hands-on and real-world aspects, the team building among the students, and the opportunity to work with volunteer classroom mentors.

A World in Motion Challenge 2 and Challenge 3

With a grant from the United States National Science Foundation, SAE developed and launched *A World in Motion Challenge 2 and Challenge 3* in 1996. The problem-based units require students in Grades 7 and 8 to work in teams to design and build motorized toy vehicles and gliders. This program also provides opportunities for engineers, scientists and other professionals to volunteer in the classroom.

A World in Motion Challenge 4

The newest curricula in the *A World In Motion* series, Challenge 4: Electric Motion includes 35 experiments in subject areas like static electricity, batteries, circuits, magnets, and transistors. Introduced in September 2003, Challenge 4 is a CD-ROM based curriculum that combines online learning with hands-on activities and helps students in grades 4-10 learn about the fascinating principles of electricity and electronics. Students work in small groups together with their teachers and volunteer engineer or scientist to conduct various experiments and compile reports for presentation to the class.

This program is great for all of Toronto!

Donna Quan
Superintendent
Toronto District School Board

“*These are the best teaching materials I’ve used in thirty years.*”

Fraser Gordon
5th Grade Teacher
Ancaster Public School

Bringing A World in Motion to Life

In order to receive the curriculum free of charge, schools typically form a partnership with area corporations, which then provide volunteers to assist in the classroom. As these volunteer engineers and scientists work with students, they provide technical assistance and serve as role models for young people who may have never considered a career in science and engineering. Throughout both programs, SAE gives special emphasis to attracting women and minorities into engineering.

Collegiate Design

A critical element of workforce development must be to recruit, motivate and challenge our most promising students as they pursue undergraduate and graduate degrees in engineering. To prepare engineering students for future employment, SAE hosts the prestigious Collegiate Design Series, which includes Aero Design[®], Clean Snowmobile Challenge[™], Formula SAE[®], Mini Baja[®], Supermileage[®] and Walking Robot Challenge[™]. There are currently 35 SAE Student Chapters in Canada, and the number of Canadian schools competing grows each year. Canadian teams have competed in Supermileage[®], Walking Robot Challenge[™], Clean Snowmobile Challenge[™], Formula SAE[®], Aero East, Aero West, Mini Baja[®] East, Mini Baja[®] West and Midwest Mini Baja[®]. University students participating in the design competitions learn valuable workplace skills, including teamwork, project management, budgeting and marketing. They also have the opportunity to showcase their talents and turn theory into practice while potential employers view the competitions.





A Call to Action

Why you should support the SAE Foundation Canada

The Society of Automotive Engineers is committed to stimulating interest in engineering and science education. In fact, one of SAE's strategic missions is to "encourage, influence and enhance the formal education process in mobility technology." Through its more than 80,000 members, 68 sections, and 314 North American student chapters, SAE can implement programs that are not affected by shifts in one organization's management or financial outlook.

With educational programs spanning from elementary school through university study, SAE is already making progress in attracting more young people to the field of engineering. SAE works to attract mechanical, electrical, chemical, computer and environmental engineers, among

others, to the mobility engineering profession. While scholarship programs and design competitions focus on engineering students, *A World in Motion* reaches our youngest students, in an effort to recruit the next generation of engineers and prepare all our young people for an increasingly technical world.

How your support benefits your company

By supporting the SAE Foundation Canada (a registered charity), your company will take a stand to help solve a national problem in education and workforce development. Contributions to the Foundation will enable your company to provide a community-focused education initiative that adds a real-world dimension to the education of young people and university students in the local area of your plants and offices.

In addition, as more students progress through SAE's educational programs in the communities in which your company has involvement, you will benefit from a workforce of new hires – especially young women and minority students – who are more technically literate.

Active participation in the educational programs will also enable your company to help reverse mathematics/science deficiencies in Canadian education, establish collaborations among manufacturing and design personnel by voluntarily working with schools, and strengthen ties with the future workforce.

Summary

A World in Motion

Since 1990, the SAE Foundation (Society of Automotive Engineers) has made support for the dissemination of its mathematics and science education programs a top priority. SAE's hands-on elementary and secondary school program, *A World in Motion*, enables students to perform real engineering tasks with the aid of a volunteer engineer or scientist. These programs are also highly effective in reaching girls and minorities, two groups traditionally under-represented in the engineering field. By focusing on the educational needs of children, SAE provides critical resources to help teachers encourage students to remain excited about mathematics and science and thus pursue careers in fields such as engineering.

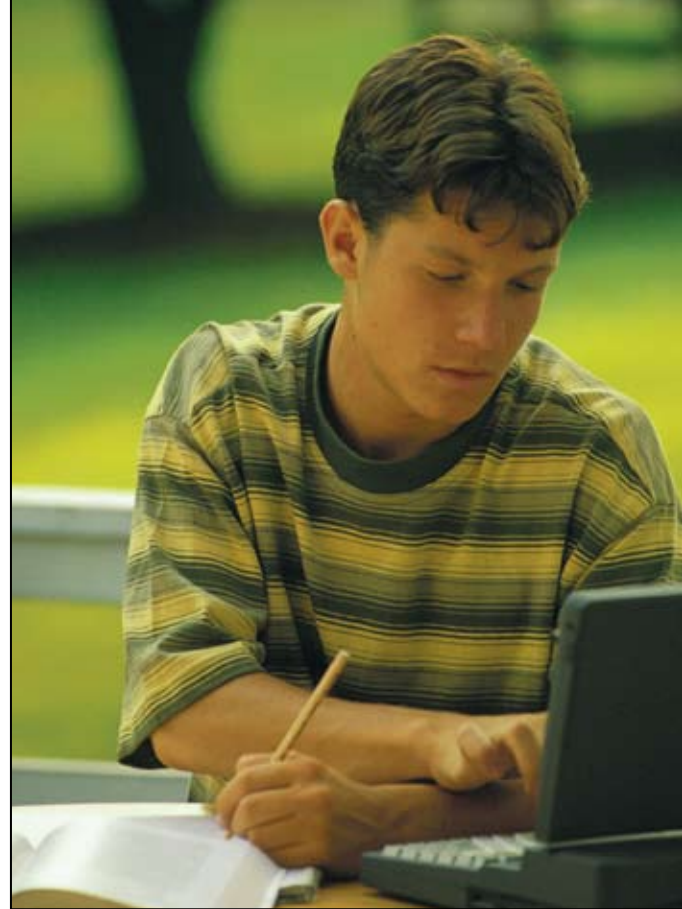
In addition, the SAE Foundation supports scholarships and design competitions for undergraduate and graduate engineering majors as well as recognition awards for professional engineers.

SAE believes that in order to sustain and improve mobility technology, it is critical that more students choose careers in science and engineering. SAE Foundation Canada provides a means for Canadian corporations and foundations to join us in this critical venture.

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SAE Foundation Canada



VISION STATEMENT:

The foundation has made a positive impact on engineering education while serving the needs of Canadian society by ensuring adequate funding is available for priority projects.