

# The GL2 STEM Partnership Approach

Building a Community-Focused Innovative STEM Program with a National Reach



**GLOBAL**  
LEARNING & LEADERSHIP



**2015 International Student Assessment Results for the U.S.**

Math

Science

Reading

Rank	Country	Score	Rank	Country	Score	Rank	Country	Score
1	Singapore	564	1	Singapore	535	1	Singapore	535
2	Hong Kong	548	2	Japan	538	2	Hong Kong	527
3	Macao	544	3	Estonia	534	3	Canada	527
4	Taiwan	542	4	Chinese Taipei	532	4	Finland	526
5	Japan	532	5	Finland	531	5	Ireland	521
6	China	531	6	Macao	529	6	Estonia	519
7	Korea	524	7	Canada	528	7	Korea	517
8	Switzerland	521	8	Viet Nam	525	8	Japan	516
9	Estonia	520	9	Hong Kong	523	9	Norway	513
10	Canada	516	10	China	518	10	New Zealand	509
11	Netherlands	512	11	Korea	516	11	Germany	509
12	Denmark	511	12	New Zealand	513	12	Macao	509
13	Finland	511	13	Slovenia	513	13	Poland	506
14	Slovenia	510	14	Australia	510	14	Slovenia	505
15	Belgium	507	15	United Kingdom	509	15	Netherlands	503
16	Germany	506	16	Germany	509	16	Austria	503
17	Poland	504	17	Netherlands	509	17	Sweden	500
18	Ireland	504	18	Switzerland	506	18	Denmark	500
19	Norway	502	19	Ireland	503	19	France	499
20	Austria	497	20	Belgium	502	20	Belgium	499
21	New Zealand	495	21	Denmark	502	21	Portugal	498
22	Viet Nam	495	22	Poland	501	22	United Kingdom	498
23	Russia	494	23	Portugal	501	23	Taiwan	497
24	Sweden	494	24	Norway	498	24	United States	497
25	Australia	494	25	United States	496	25	Spain	496
26	France	493	26	Austria	495	26	Russia	495
27	United Kingdom	492	27	France	495	27	China	494
28	Czech Republic	492	28	Sweden	493	28	Switzerland	492
29	Portugal	492	29	Czech Republic	493	29	Latvia	488

40	United States	470
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## Academic Performance of Schools Challenged

2015 PISA Scores	2015 US Report Card
US / Canada Rankings	At or above, Proficient Level
Math: Canada 10 <sup>th</sup> / US 40 <sup>th</sup>	Reading / Math
Rdg: Canada 3 <sup>rd</sup> / US 24 <sup>th</sup>	4 <sup>th</sup> 36% / 40%
Sci: Canada 7 <sup>th</sup> / US 25 <sup>th</sup>	8 <sup>th</sup> 34%↓ / 33%↓
	12 <sup>th</sup> 37%↓ / 25%↓

## Resulting Impact from Years of Poor Academic Performance

Thousands of . . . jobs go unfilled every year; *employers cannot find qualified candidates in sufficient numbers* (Crain's Chicago Business)

**Conclusion:** The social and economic health of communities depends on having an education system that prepares students for civic engagement in the regional and global job markets.

**Vision:** Students from regional communities possess the essential STEM knowledge, skills, and confidence in their abilities to be competitive in the global economy based on academic success starting in elementary school



**Former Astronaut Sally Ride** stated “And it really starts at the elementary school level. Unless you give students an appreciation for why this is important to them (science) and that, by the way, it’s really cool stuff, they’re going to drift away from it as they go on through school.”



*To achieve significant change in participation and academic performance requires innovative, highly engaging, experience-based elementary programs to challenge students at an early age.*

# Securing Economic Vitality Requires Expanding Diverse STEM Opportunities for All Students

- We need to demonstrate solutions to provide minorities, girls, and women with proven pathways to obtain good jobs and a higher standard of living by emphasizing STEM education in a well-rounded education program (women hold only 25% of STEM jobs)
- Education remains unequal for minorities and girls. STEM has great potential to reverse this trend.
- Only 2% of Latinos and Hispanics and 3% of African Americans earn a B.S. degree in natural sciences or engineering by age 24.
- In 2011, the average annual wage for all STEM occupations was \$79K, compared to \$44K for non-STEM occupations
- During 2005-2015, STEM Jobs grew three times faster than non-STEM jobs. In 2015, the unemployment rate for STEM workers was 5%, all other occupations were at 10%



# Students Interact with Mentors and Project Advisors



- ❖ Meet student, community and regional needs
- ❖ Emphasize STEM in a balanced education program
- ❖ Merge education and training with real-life businesses and communities
- ❖ Use powerful information/communication technology to gain a competitive edge)
- ❖ Provide outstanding professional development to enhance teaching methods
- ❖ Teach/Learn in a 21<sup>st</sup> Century context (Similar to industry/business/researchers)
- ❖ Modify teaching and learning practices to enable students think, collaborate, create, and communicate in a global technologically connected world

## **Examples of Industry/Business Support for a National Model STEM Demonstration Program**

### **Global Reach through a Local Focus**

- Serve as charter members of an Industry Advisory Board to provide leadership to the Model STEM Demo Program with business/industry and community organizations
- Industry to highlight in public meetings the importance of a Model STEM Demo Program to the economic vitality of the region.
- Sponsor meetings with elected officials.
- Recruit non-profits to expand funding support assistance for the Program.
- Serve as an industry leader joining the local, regional, and state Chambers for a celebration of program activities/accomplishments (e.g. 3 school districts or park districts, 50 firms, 3 labor organizations, 6 civic groups).
- Work with partners to provide exhibits to present the role of industry to support a National STEM Demo Model for communities across the state, region and the U.S.



### **Educational Support at the Local and Regional Level**

- Sponsor STEM training for teachers, principals, and other school leaders.
- Sponsor an exclusive teacher event to highlight the role of industry in supporting innovative STEM education (e.g. 8 firms)
- Demonstrate STEM applications at pilot schools (on-site and virtually), provide web casts into schools once/month to build student excitement in learning.



- Provide financial assistance for after school STEM clubs and/or serve as a sponsor of one school class (10 industry partners each sponsor one class).
- Donate IT/communications equipment (e.g. monitors for use in school lobbies), provide videos of operations to play in classrooms and at community facilities.

## What an Outstanding Community STEM Program Will Look Like



### Classic Engineering Programs

- Mechanical
- Aerospace
- Civil
- Environmental







