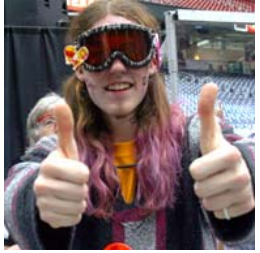
For Inspiration and Recognition of Science and Technology

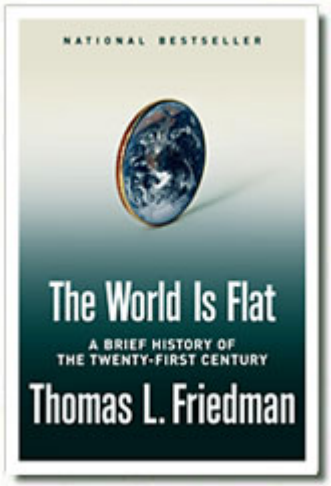
FIRST – Industry, Government and Education Coming Together Through Robotics

Cindy Randall
Director Research
FIRST
January 14, 2008

Rev. 6407

Vision





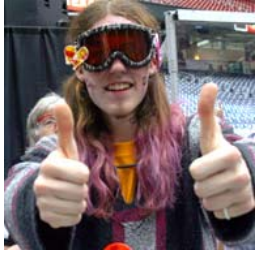
"The American education system… just is not stimulating enough young people to want to go into science, math, and engineering." (page 270)

"…we have done a very poor job of conveying to kids the value of science and technology as a career choice…"

"…we should be embarking on an all-hands-on-deck, no-holds-barred, no-budget-too-large, crash program for science and engineering education immediately." *(page 275)*

FIRST®

21st Century Workforce Specifications


Knowledge

Math

Sciences

Psychology

History

Global Geography/Culture/Languages

Skills

Innovation

Teamwork/Collaboration

Problem-Solving

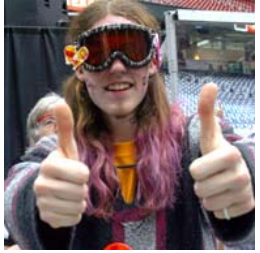
Oral/written communications

Leadership

Lifelong Learning

FIRST®

21st Century Workforce Specifications

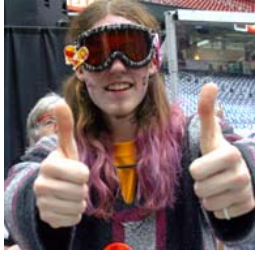



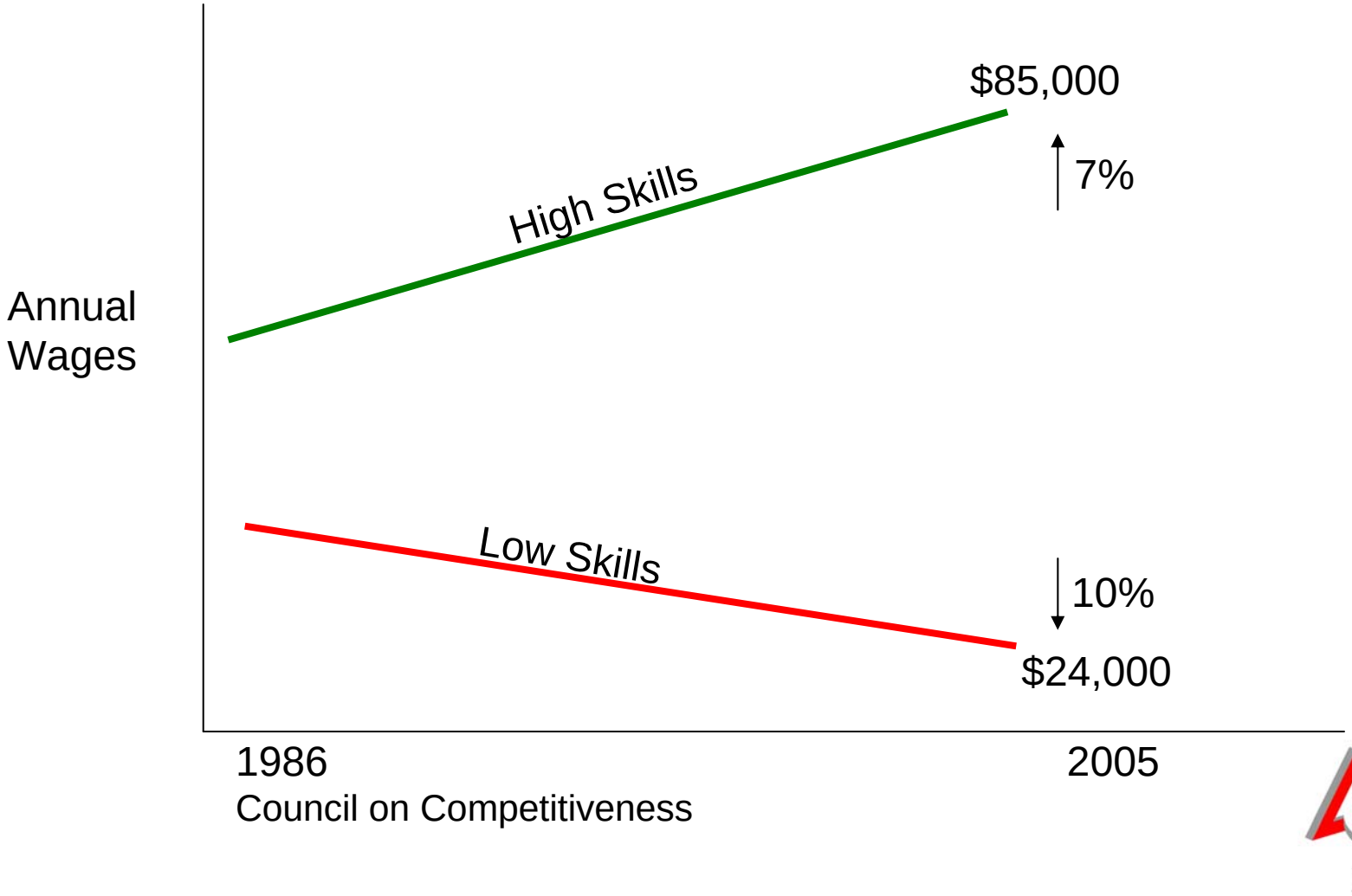

Attitude

Old	New
Security	Risk-taking
Steady Advancement	Entrepreneurial
Single/Few Employers	Many Companies/Career
Stability	Flexibility

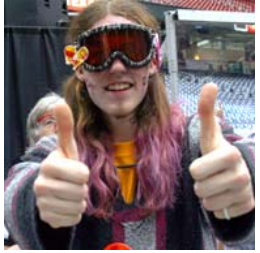
FIRST®

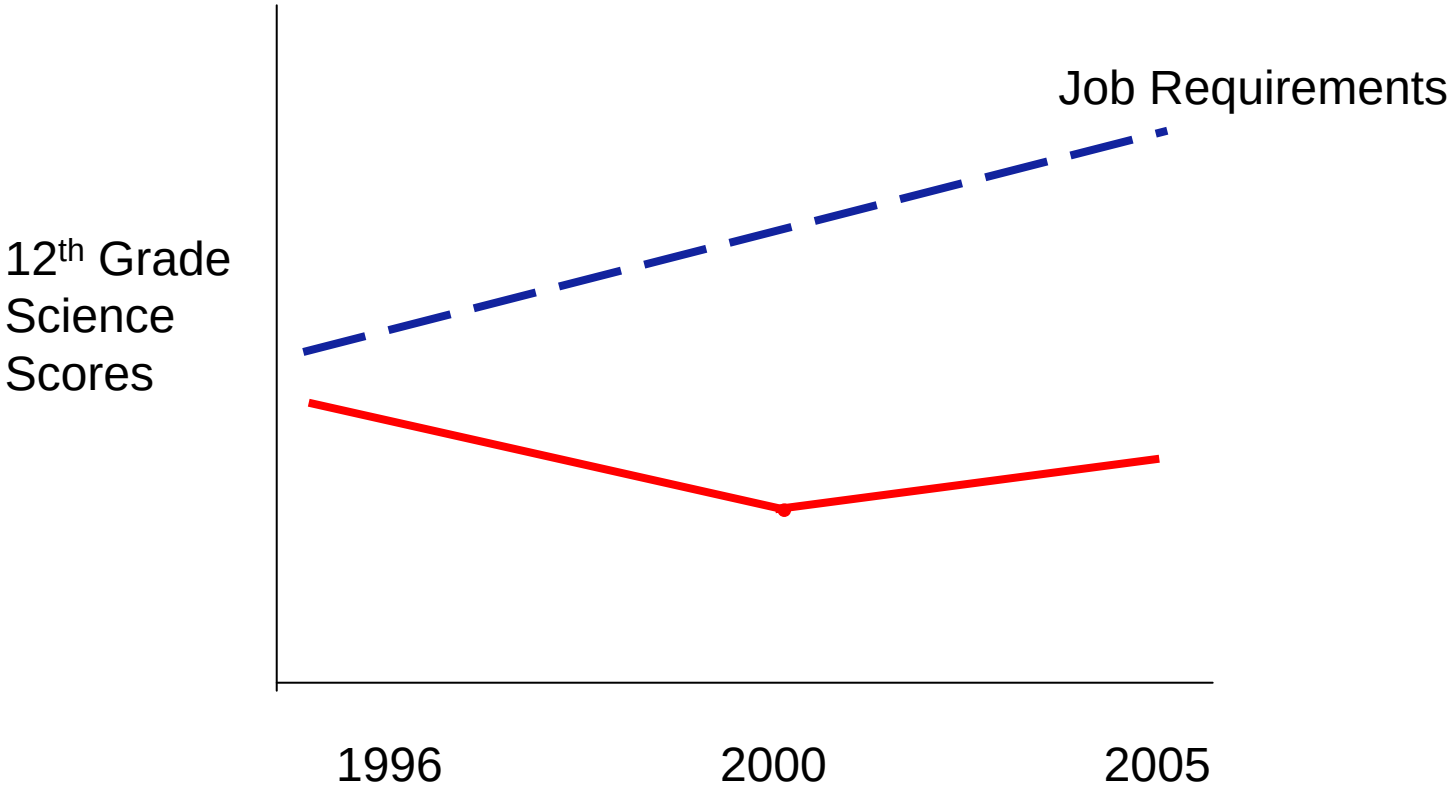
A Growing Income Gap

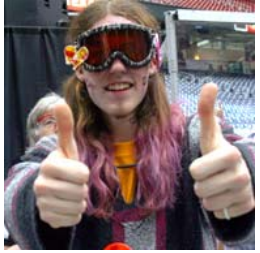



Prepared for Future?

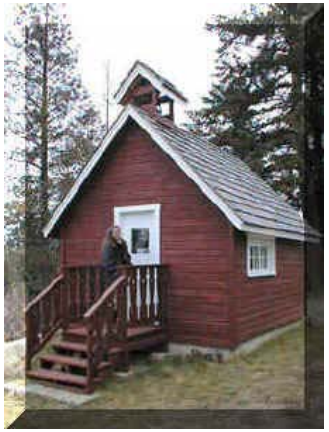



Educational Initiatives


“Supply Side”

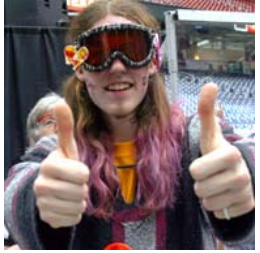


Standards
Testing
Curriculum
Teacher Quality
Merit Pay
Teacher Training
Vouchers
Charter Schools
STEM Academies
Length of School Day / Year
New School Designs

“Demand Creation”

FIRST®

Vision



"…to create a world where science and technology are celebrated…

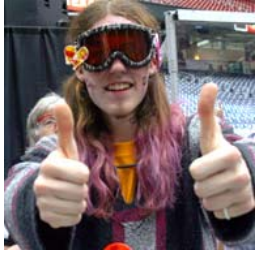
…where young people dream of becoming science and technology heroes…"

Dean Kamen

Founder

FIRST®

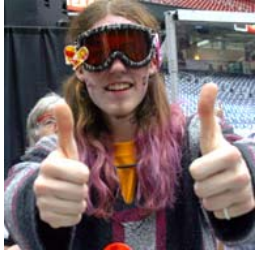
FIRST Overview



- 501 (c) (3) not-for-profit organization
- Headquarters in Manchester, NH
- Board Chairman John Abele, Founder Chairman of Boston Scientific
- $25 million operating budget
- 2,000 corporate sponsors
- 60,000 volunteers
- Over 9 million in college scholarships

FIRST®

FIRST Program Continuum


“Sports Model”

“T-Ball”

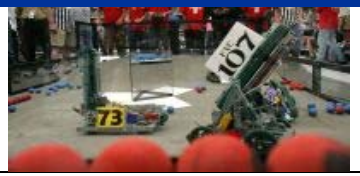
Jr. *FIRST* LEGO League

“Little League”

***FIRST* LEGO League**

“Junior Varsity”

***FIRST* Tech Challenge**



“Major League”

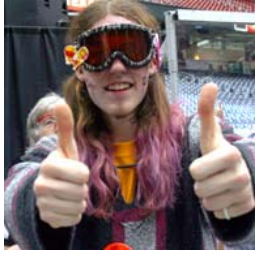
***FIRST* Robotics Competition**

K 1 2 3 4 5 6 7 8 9 10 11 12

Grade Level

FIRST®

Organization & Programs

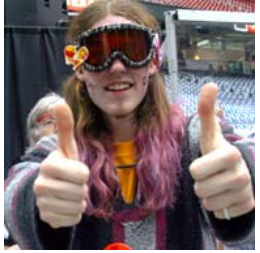


FIRST Robotics Competition: How It Works

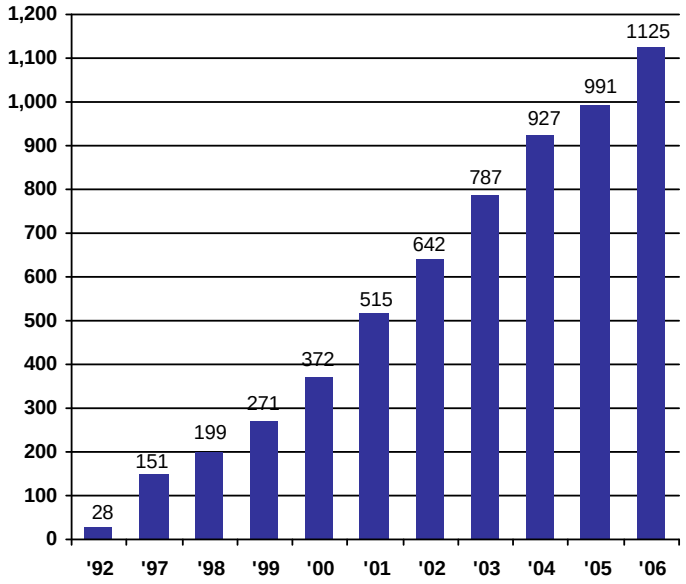
- Combines the excitement of sport with science and technology
- Creates a unique varsity sport for the mind
- High-school-aged young people discover the value of education and careers in science, technology, and engineering
- New game each year
- Common kit of parts
- 6-week build period

FIRST®

Organization & Programs



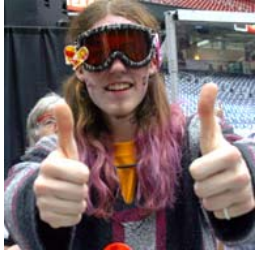
FIRST ROBOTICS COMPETITION TEAM GROWTH



- Over 1500 teams
- 30,000 high-school-age students
- 41 regional competitions

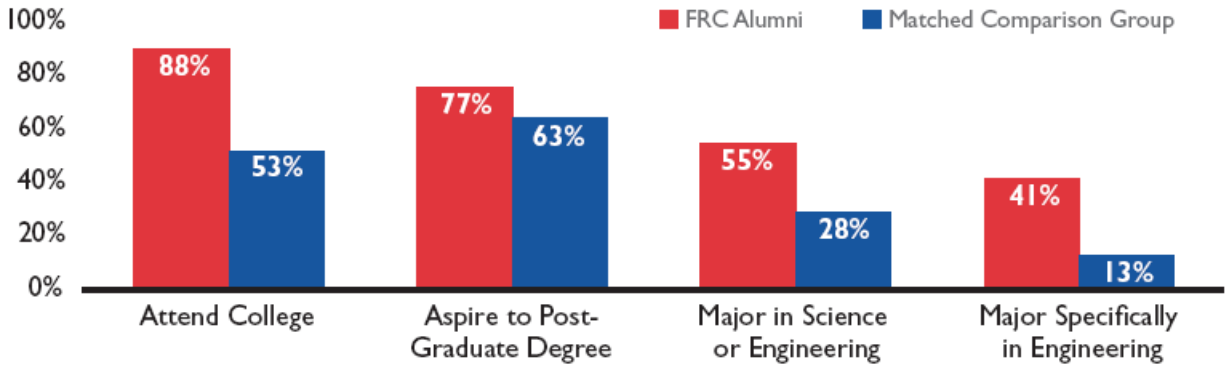
FIRST®

Impact

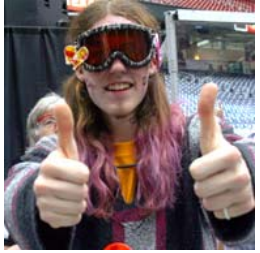

Education in Science & Technology

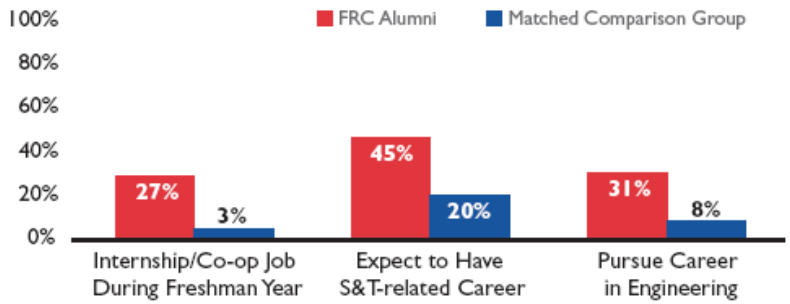
- *FIRST* Students vs. Comparison Group
- Seek Education in Science &Technology
  - Twice as likely to major in science or engineering
  - More than three times as likely to major specifically in engineering



Source: Brandeis University, Center for Youth and Communities, Heller School for Social Policy and Management

Impact



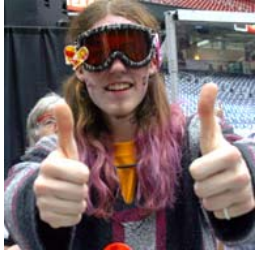


Careers in Science & Technology

- *FIRST* Students vs. Comparison Group
- Earn Career Opportunities:
  - Almost ten times more likely to have internship
- Expect to Pursue Science & Technology Careers:
  - More than twice as likely to pursue S&T career
  - Nearly four times as likely to pursue career specifically in engineering

Source: Brandeis University, Center for Youth and Communities, Heller School for Social Policy and Management

Organization & Programs



FIRST LEGO League: How It Works

Problem Solving and Creativity

- Present kids with a real-world problem
- Unleash thinking, energy, and fun
- 2007 Challenge: “Power Puzzle”

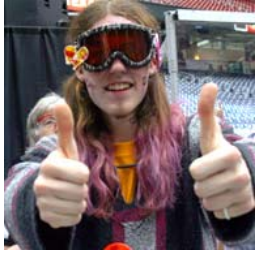
Teams of Kids and Mentors

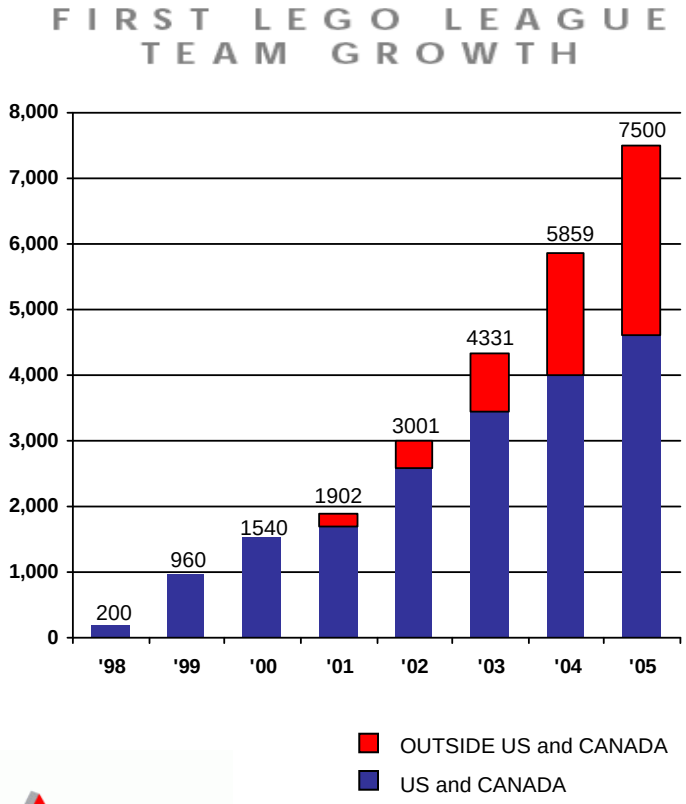
- Work as a team
- Learn with adults and mentors

Do It All In 8 Weeks

- A Timeline to learn efficiency and effectiveness
- Compete with peers in Tournament

Organization & Programs



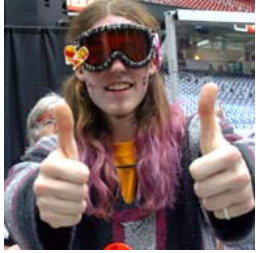


- 10,000 teams
- 100,000 middle-school-age students
- 45 countries
- 300+ qualifying events
- 68 tournaments
- Junior FLL for 6 to 9 year-olds

FLL
FIRST LEGO® League

FIRST®

II. Organization & Programs

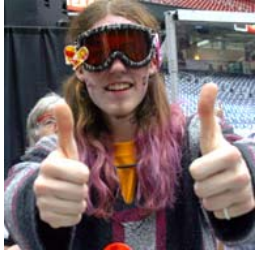


FIRST Tech Challenge: How It Works

- Pilot program
- More accessible, affordable *FIRST* experience
- Creates bridge between FLL and FRC
- Off-the-shelf kit of parts

FIRST®

Organization & Programs

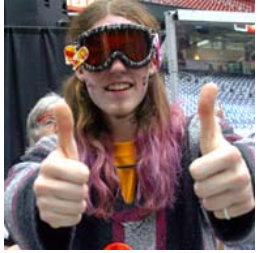


FIRST Tech Challenge

- 800 teams
- 5,000 high-school-age students
- 40 states represented
- 24 events

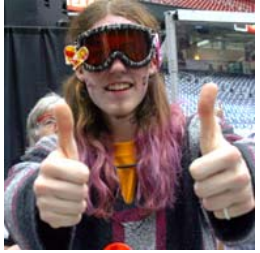
FIRST®

FTC, DHS and NIST Partnership



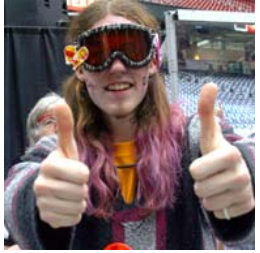
FIRST®

Super Bowl Winners at the White House



FIRST®

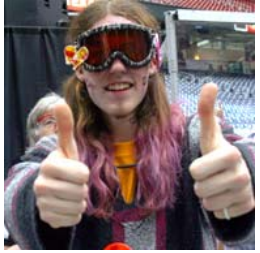
Sponsors and Mentors


Over 2,000 leading corporations, foundations, agencies, including:

BAE SYSTEMS
GM
LEGO
hp invent
THE DOCUMENT COMPANY XEROX
FedEx
Kimberly-Clark
NASA
Google
Johnson & Johnson
Baxter
KPCB Kleiner Perkins Caufield & Byers
Coca-Cola
Boston Scientific
3M
Texas Instruments
LOCKHEED MARTIN
DEKA
Autodesk
FIRST

Ready for a Flat World


Knowledge

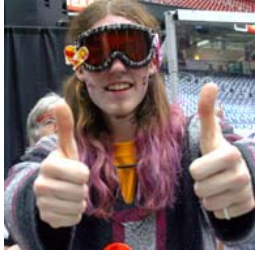
Math	✓
Sciences	✓
Psychology	
History	
Global Geography/Culture/ Language	✓

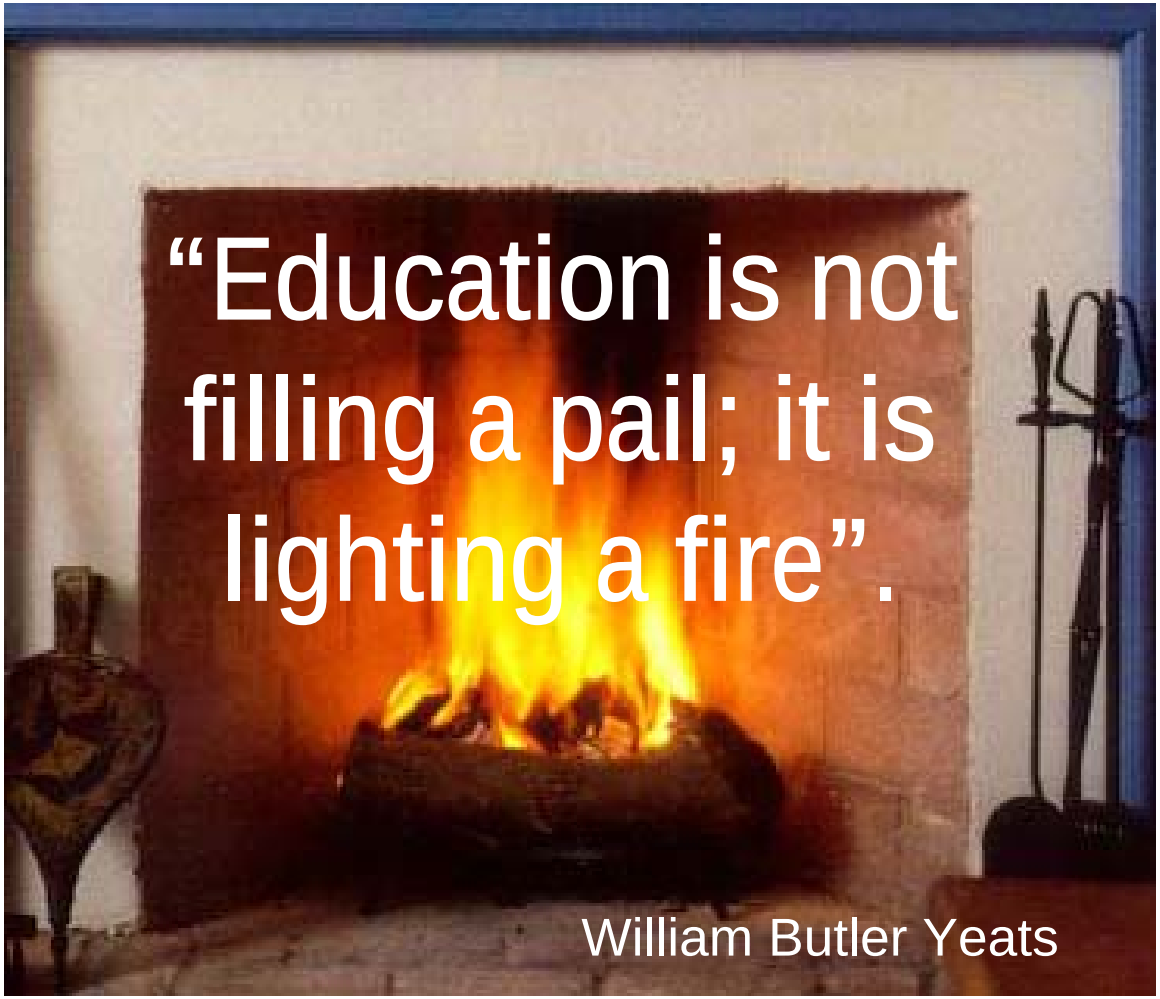
Skills

Innovation	✓
Teamwork/Collaboration	✓
Problem-Solving	✓
Oral/Written Communication	✓
Leadership	✓
Lifelong Learning	✓

FIRST®

Inspiring the Next Generation





FIRST®