

# STEM Pipeline Initiative (Science, Technology, Engineering and Mathematics)

## *UMASS Lowell Superintendents' Forum*

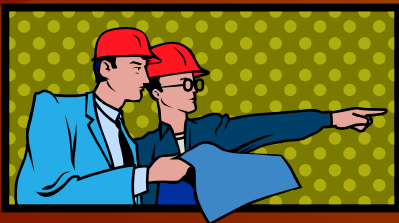
*Dennis A. Richards  
Superintendent-Elect  
Falmouth Public Schools  
[www.falmouth.k12.ma.us](http://www.falmouth.k12.ma.us)*



# Our future depends on the STEM Pipeline



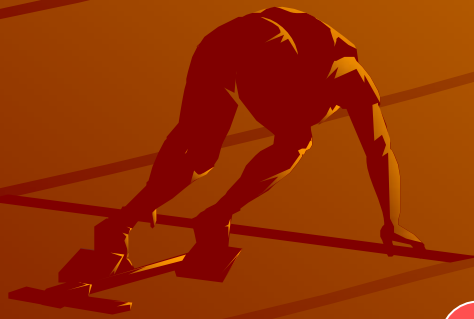
The future of an  
innovation economy,  
based on  
emerging technologies,  
depends on  
the STEM Pipeline.



Our Future!

~ 1999 ~

US eighth graders ranked  
seventeenth among thirty-  
eight countries.



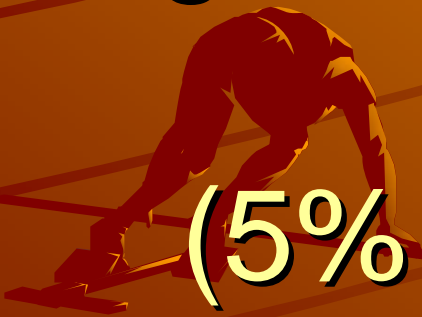
How does the United States rank  
among the countries of the world for  
total number of Olympic metals?

1st with  
2380 (2004)



~ 2001 ~

The United States  
granted 59,500 degrees in  
engineering  
(5% of the total degrees).

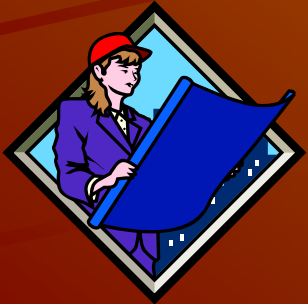


~ 2001 ~

China graduated 220,000  
engineers in engineering  
(39% of the total degrees).

How does China rank among the  
countries of the world for total  
number of Olympic metals?

14<sup>th</sup> with 308  
(2004)



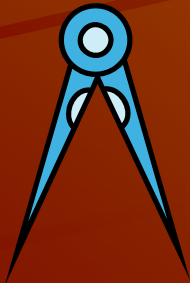
Innovation Economy  
Emerging Technologies  
The STEM Pipeline

**Our Future!**



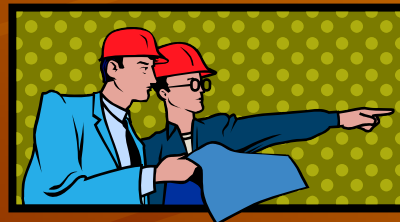
~ 1986 to 1996 ~  
**37% Decline** in  
Engineering Majors

Engineering in Mass Collaborative  
EiMC



~ 1999 ~

Interest in STEM related careers was **26%** among the Commonwealth's college bound seniors.





~ 2004 ~

Interest in STEM related careers was **19%** among the Commonwealth's college bound seniors.



Fueling the future  
STEM career pipeline  
is a problem that  
education and  
industry must work  
together to solve.



# Innovation Economy

# Emerging Technologies



# Our Future!



# The STEM Pipeline !

# Launched with \$2.5 million from the Legislature

## Three Major Objectives

- ◆ To increase the number of young people focusing on STEM careers.
- ◆ To recruit, retain and develop more STEM qualified teachers.
- ◆ To improve the quality of STEM education.

# Northeast Region Network STEM Pipeline



The STEM Fellows  
Program is supported by  
the Massachusetts Board of  
Higher Education through  
its Pipeline Fund.



# Operating Structure

- ◆ Executive Committee
- ◆ Steering Committee
- ◆ STEM Fellows Program
- ◆ Employer Advisory Council



STEM Fellows are expected to complete 60 hours of training including workshops, hands-on application experiences, externships and conferences.



# Northeast STEM Network Project Personnel

- ✦ Donald Pierson, Principal Investigator, Co-Chairman  
Dean, Graduate School of Education
- ✦ Dennis Richards, Co-Chairman  
Associate Superintendent of Schools  
Reading Public Schools
- ✦ John F. Hodgman, Howard Foley Professor for High Tech Workforce Development,  
College of Engineering,  
University of Massachusetts Lowell
- ✦ Judith Boccia, Director  
Center for Field Services and Studies  
UMASS Lowell
- ✦ Marjorie Dennis, Project Coordinator  
Center for Field Services and Studies  
UMASS Lowell
- ✦ Laura O'Dwyer, Evaluator  
Graduate School of Education  
UMASS Lowell
- ✦ John Wren, Webmaster  
UMASS Lowell

# STEM Teaching Fellows

- ✦ Professional Development
- ✦ Capstone Plans for districts
- ✦ Cadre of teachers for the future
- ✦ Solid program evaluation

# Northeast Regional STEM Network School & Colleges

- ◆ Bedford
- ◆ Beverly
- ◆ Hamilton-Wenham
- ◆ Lowell
- ◆ Methuen
- ◆ North Reading
- ◆ Reading
- ◆ Tyngsborough
- ◆ 12 More Interested
- ◆ UMASS Lowell  
(Lead Partner)
- ◆ Gordon College
- ◆ Middlesex  
Community College
- ◆ Northern Essex  
Community College
- ◆ Salem State  
College
- ◆ Endicott College

# Northeast Regional STEM Network Employers and Employers Associations

- ◆ Workforce Investment Boards (WIB)

- Greater Lowell
- Merrimack Valley
- North Shore

- ◆ Merrimack Valley Chamber of Commerce

- ◆ Netfrastructure Inc.

- ◆ Raytheon Corporation

- ◆ Abiomed, Inc.

- ◆ Nantero, Inc.

- ◆ Northeast Health System

- ◆ Wyeth Biopharmaceuticals



# Goals for the Next 5 years

1. Increase the number of STEM students by 39%

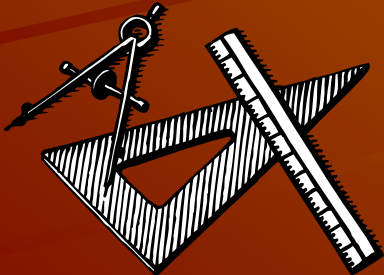
(3X females for Computer Sciences and Engineering majors, and 2X males for health sciences majors)

2. Increase the number of STEM teachers

3. Improve Math and Science instruction



Focus \$8-10 million  
annually  
on STEM Talent  
Initiative



Innovation Economy

Emerging  
Technologies



Our Future!

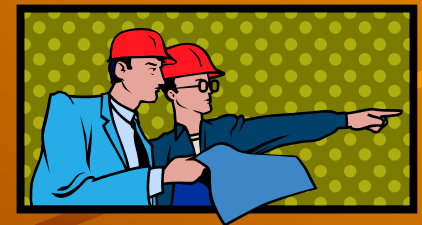


The STEM Pipeline !

# Northeast Region STEM Pipeline



<http://www.nepipeline.org/>



# Woods Hole Science and Technology Education Partnership



<http://www.who.edu/whstep/>

