

September 15, 2014

Massachusetts STEM Advisory Council: Quarterly Meeting



Massachusetts
STEM
Advisory Council

Council Update

- @Scale Update
- Lecture Series
- STEM Summit 2014
- [STEM Nexus](#)

Boston STEM Network

www.bostonstemnetwork.org
@BostonSTEM



BOSTON PRIVATE INDUSTRY COUNCIL



State of STEM Report

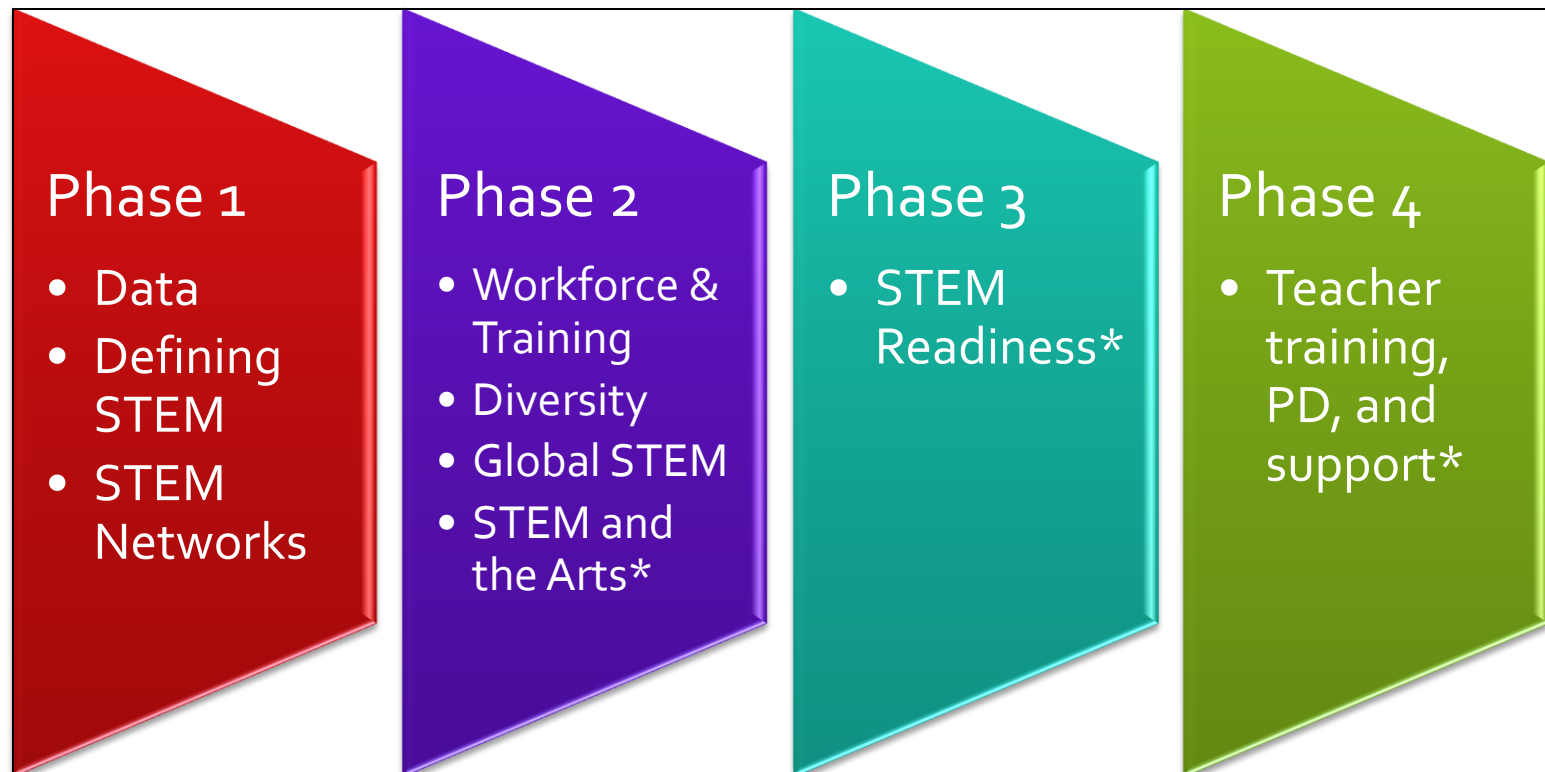
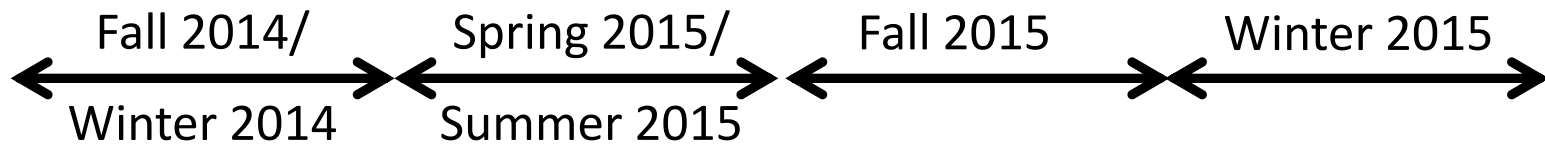


Assessing the State of STEM in Boston

- Provides a baseline measure of student interest and achievement in STEM subjects and careers
- Includes units and competencies for Boston Public School Science & Math curriculums for: elementary, middle and high school
- Uses data from BostoNavigator to measure capacity of out-of-school time STEM and informal science opportunities
- Describes origins of Boston STEM Network and past initiatives that address the State STEM goals
- Will be used as a document to measure progress, inform decision-making and drive Network activity



Subcommittee Presentations





THE SCIENCE *of* POSSIBILITY



STEM Council Meeting

Dr. Jeffrey Leiden | September 15, 2014
Chairman, President & CEO, Vertex

Scientific Innovation & Our Economy – Why it Matters

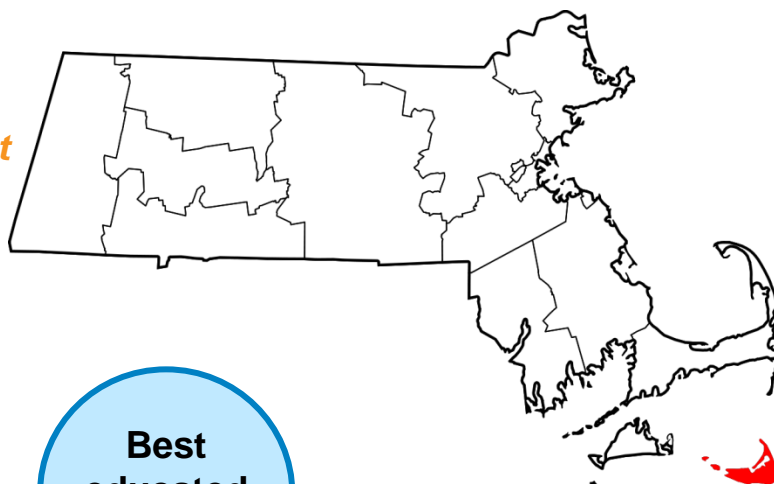
**Biopharma
grew 40%
from 2002-
11**

- **>56k jobs; \$6.5B in state payroll**
- **40% growth 2002-2011**
- **25% of companies formed in last 3 years are in greater Boston**

- **122 colleges & universities**
- **~5,600 STEM graduates per year**

- **MA VC firms raised \$5.4B in 2013 (3x 2012)**
- **Top 5 NIH funded research hospitals in the U.S.**
- **\$3B in medical research funding**

**Leader in
public/private
funding**

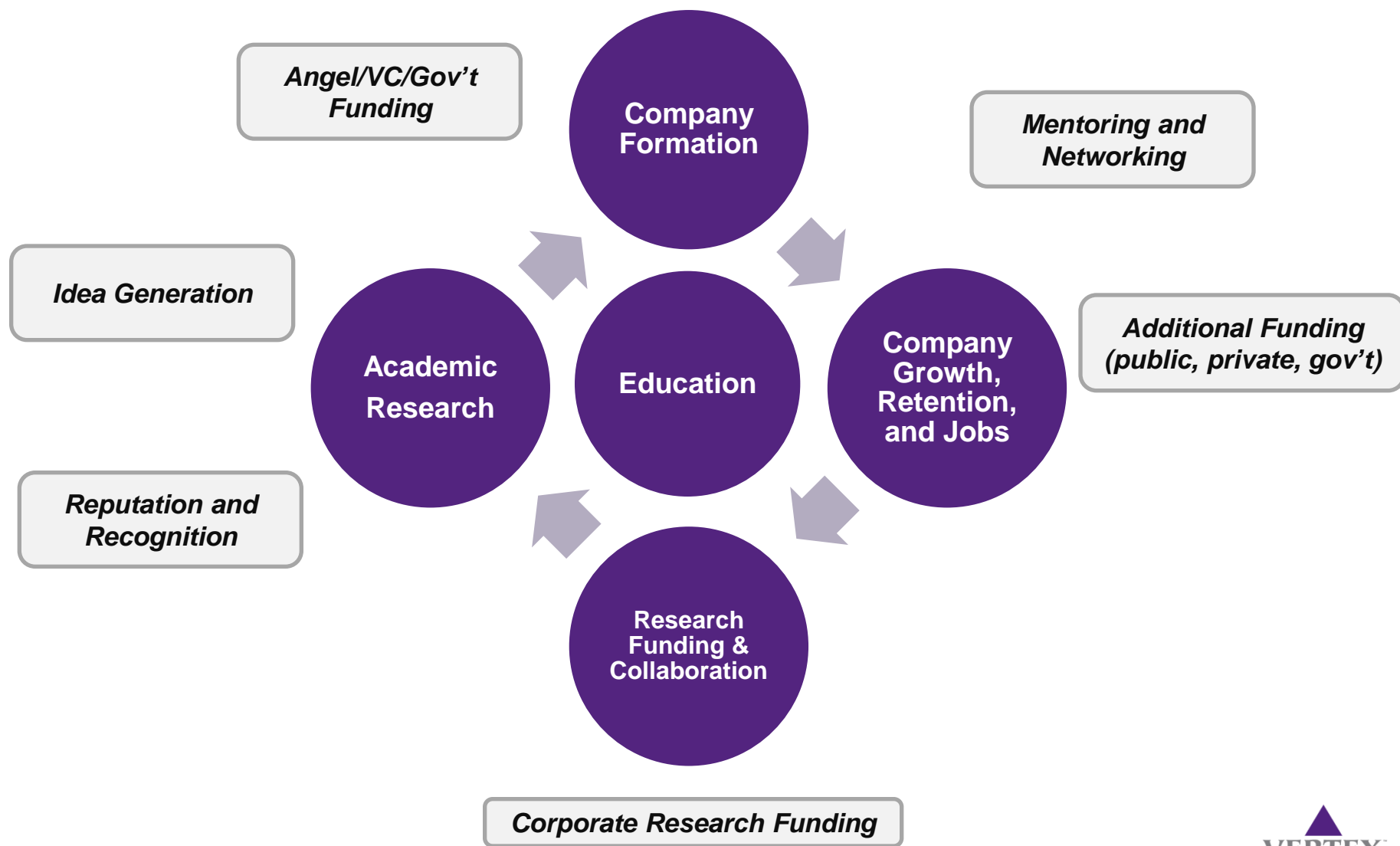


**Best
educated
workforce**

**2nd highest
concentration
of tech jobs**

- **6.5% of the workforce; 209k jobs**
- **11k jobs added 2009-12**
- **13,500 firms**

The Innovation Ecosystem: A Public/Private Partnership



The Council Has Made Significant Gains Within the Public Sector

- ✓ **Established a governance system** to prioritize, align and recommend funding for STEM education policy proposals
- ✓ **Increased funding** for schools, teacher development and STEM initiatives
 - \$1.5M for the STEM Pipeline Fund for FY 2014
- ✓ **Increased public awareness** including identifying role models who help educate parents, guardians and the business community
- ✓ **Established 8 regional STEM networks, with the 9th to be formed on the Cape and Islands** which are instrumental in building support for STEM throughout the state
- ✓ **Promoted and scaled best practices initiatives** to increase student preparation for and interest in STEM through @Scale



Governor's STEM Advisory Council

Coordinated Business Engagement Has Lagged Behind the Public Sector

The Business Engagement Council Will:

- Work with the Council to strengthen industry partnerships and align public-private efforts to advance STEM talent

By:

- Convening a diverse group of business leaders representing STEM related companies who have demonstrated a commitment to STEM education and experience with initiatives that have successfully affected change.

Success Will Be Determined By:

- Level of attention and investment from the private sector
- Support from companies of all sizes across the Commonwealth
- Reaching students beyond the urban areas
- Creating a coordinated public-private effort
- Opportunities to learn beyond the classroom (experiential, mentorships)



Keys to Garnering Business Support: Less is More

For the business leader, STEM initiatives must be:

- 1. Focused:** more investment in fewer initiatives
- 2. Repeatable:** able to be replicated across the Commonwealth
- 3. Successful:** demonstrated high impact with proven track record (strong metrics)
- 4. Educational**

Business Initiative: MassCAN

Partnership of educators, industry professionals, and non-profits collaborating to inspire and educate Massachusetts students in computing and prepare them to lead and innovate in a future economy that will be dependent on and driven by computing technology.

Standards
What is taught

Curriculum
How computing is taught

Professional Development
Who teaches computing

Public Awareness
Why to study computing



- ✓ Secured seed funds
- ✓ Raised long-term funds
- ✓ Expanded coalition & strategy

Case Study: Boston PIC



Organizing private sector employers from the region's leading companies to neighborhood small businesses to participate in the Summer Jobs Campaign.

- ✓ **Placed 2,600 high school students in paid, employer-supervised positions**
 - More than 650 STEM-related positions
- ✓ **More than 300 Boston employers provide summer jobs**
- ✓ **More than 3,200 students prepared for summer jobs and internships through Job Readiness Workshops conducted by PIC career specialists**
 - Students & employers are supported throughout the program

The Boston Globe

In 2014, Boston allocated nearly \$4 million and receives another \$2.6 million from the state to fund about 7,000 youth jobs...But getting private employers to match public efforts has been a challenge. - Aug. 18, 2014

Next Steps

- ❑ Convene business leader roundtable on Oct. 6
- ❑ Review proposals from two initiatives; determine needs
- ❑ Generate business support
- ❑ Provide an update and more details at the Oct. 22 STEM Summit

STEM Council Presentation
September 15, 2014

Data Subcommittee



Massachusetts
STEM
Advisory Council

Data Subcommittee Purpose

- We have a lot of data in the STEM Dashboard. The Data team will work to make this data useful to our key audiences and support the data needs of other committees.
- We also want to work on recommendations to address remaining data gaps.

Audiences & Purposes

Level I: STEM Council, Pipeline Fund, Regional Networks

- Policy and Operational Decisions

Level II: Governor, Legislature, Key Public Officials

- Executive Oversight & Fiscal Accountability

Level III: Employers, Educators, Public

- Align Initiatives with STEM Plan & Advocacy Tool

Requirements for Data

- Focused directly on MA STEM education & workforce and linked to 5 STEM Plan Goals
- Annual or other cyclical regular sources
- Publicly available
- Accessible & meaningful for wide array of audiences and purposes
- Free or low cost

Illustration: STEM Plan Goal 1

- Increase % of high school students planning on STEM majors
- Measured by SAT test taker data
- Recent status and progress toward target:

	2009	2011	2013	Target 2016
Planning STEM majors	35%	37.7%	40.5%	45%

Illustration: Goal 2

- Increase PreK-12 student achievement.
- Measured by % of proficient & advanced on Math & Science MCAS
- Recent status and progress toward target:

	2011	2013	Target 2016
Math MCAS	77%	80%	85%
Science MCAS	67%	71%	72%

STEM Dashboard

Conceptual Model

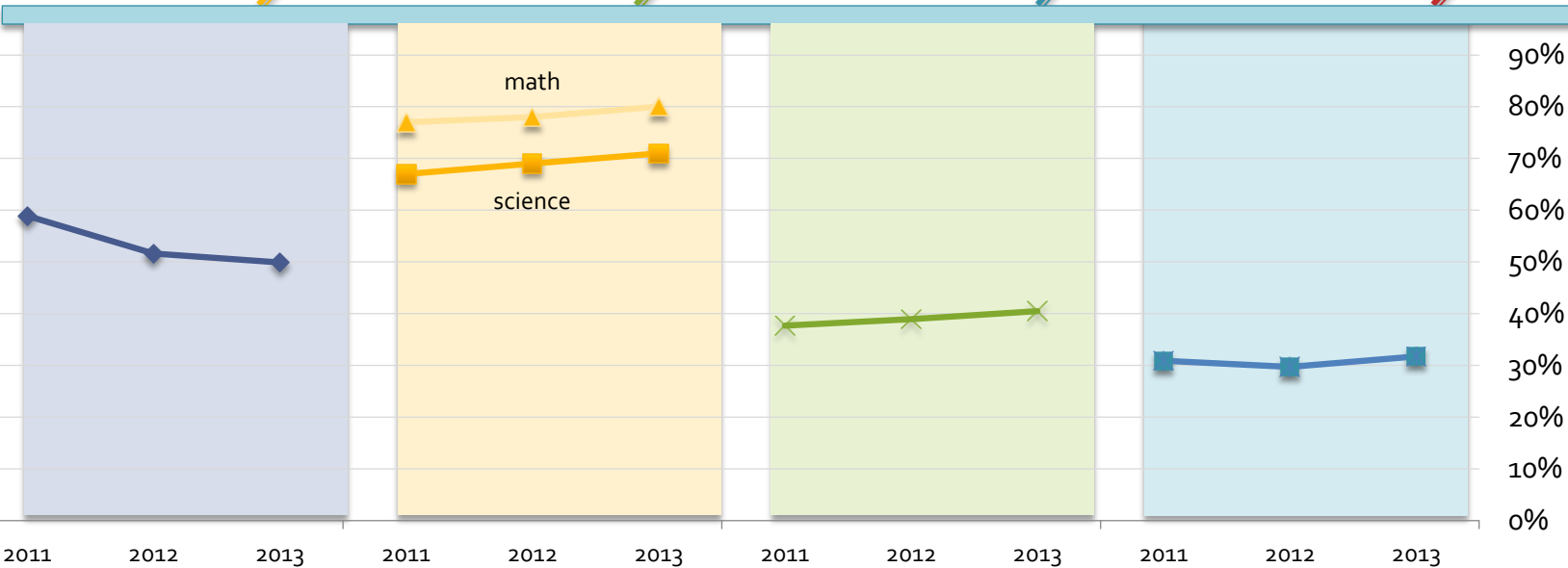
Teachers

K-12
Preparation

K-12
Interest &
Achievement

STEM
Degrees &
Certificates

Employment
in STEM
Careers



- ◆ 1st Time MTEL takers who passed STEM subject tests
- Scoring proficient or advanced in 10th grade MCAS-Science
- ▲ Scoring proficient or advanced in 10th grade MCAS-Math
- × SAT college bound seniors ranking STEM major 1st choice
- Share of college certificates and degrees in STEM fields

Questions for Council Members

- If we make changes to the Data Dashboard, what are the most critical needed in the near term (12 to 24 months) versus longer term (24 to 48 months)?
- How often, at what level of detail, and to whom should the data be communicated?

Contact Information

Allison Scheff

E-mail: ascheff@bhe.mass.edu

Phone: 617.994.6935