

# Helping all kids discover and achieve their dreams



American Institutes for Research  
Using Research to Inform Policies and  
Practices in STEM Education Symposium

September 2013

## An innovative model



We expand a middle school's learning day



by connecting a team of adults



to provide relevant learning experiences



that give students the skills, access, and beliefs



they need to succeed in school, college, and careers.

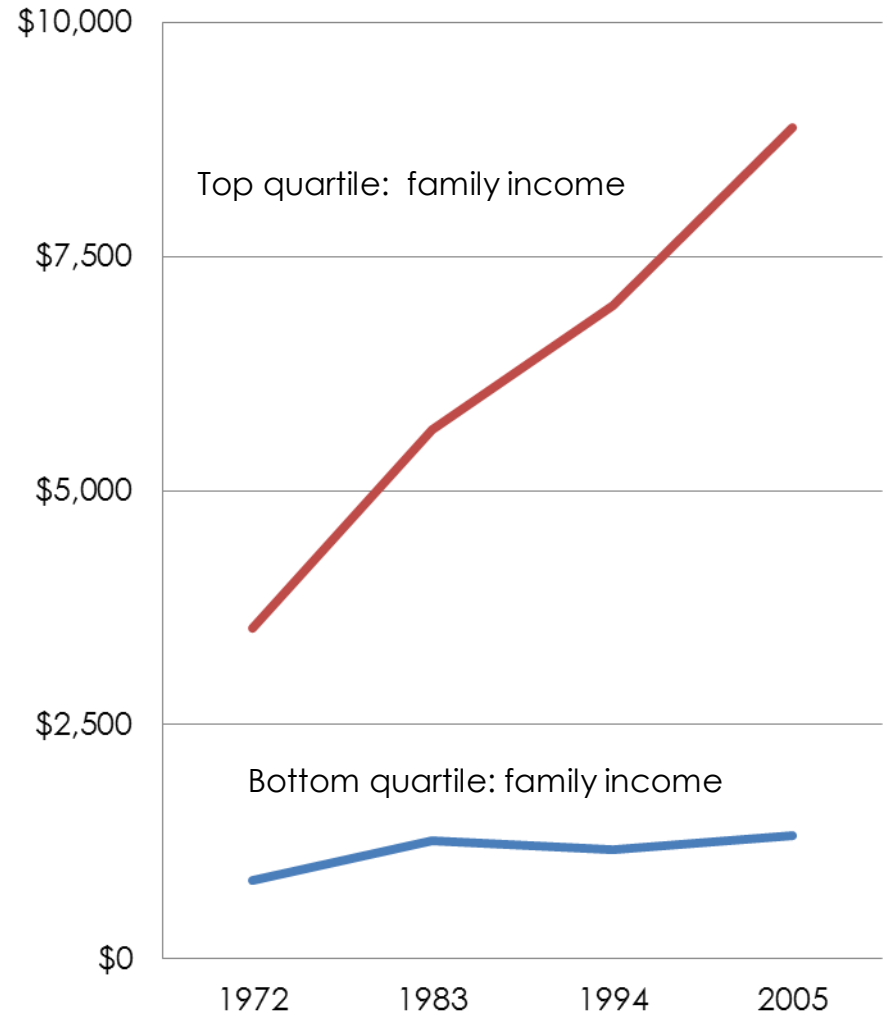
### NATIONAL LEADERSHIP PARTNERS



[http://www.youtube.com/watch?feature=player\\_embedded&v=U1X6TyyDhO8](http://www.youtube.com/watch?feature=player_embedded&v=U1X6TyyDhO8)



## Enrichment Expenditure on Children by Family Income



Source: *Whither Opportunity?* Duncan & Murnane, 2011



When **Steve Jobs** was a teenager **a neighbor who worked as an engineer at Hewlett-Packard** got him into the **H-P Explorer's Club**, a group of about 15 students that met every Tuesday evening at the company cafeteria. Jobs reflected on how this **exposure to real world technology and the engineers who made it was a life-changer for him**: "Every week they would get an engineer from one of the labs to come and talk with us about what he or she was working on. **My dad would drive me there. I was in heaven.'**"



Evins, S.  
Evins, D.  
Jackson, M.  
Jacobs, P.  
  
Jensen, M.  
Jillie, P.  
**Jobs, S.**  
Johnson, S.  
Jones, C.  
  
Judd, K.  
Kane, J.





Typical hospital visit:

In 1970 → 1 patient interacts  
with 2 medical professionals

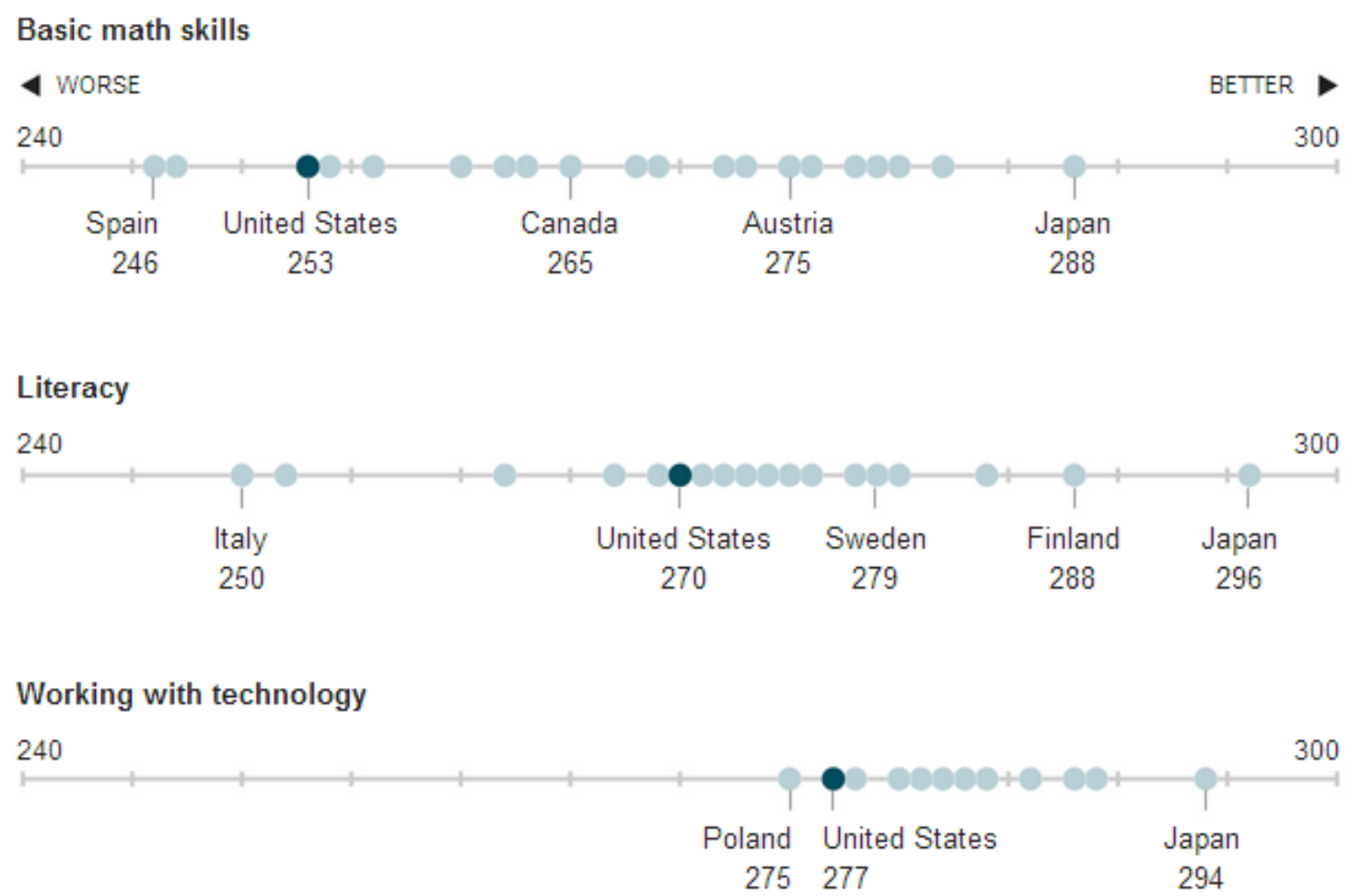
In 2013 → 1 patient  
interacts with 15

“When we look at the **positive deviants** – the hospitals who are getting the **best results** at the lowest costs -- we find the ones that look most like systems are most successful. They found ways to get all the pieces to come together into a whole. ...

**Making systems work, whether in health care, education, climate change, or pathways out of poverty, is the great task of our generation.** In every field, knowledge has exploded, but it has brought complexity, it has brought specialization. We have no choice but to recognize, as individualistic as we want to be, **complexity requires group success. We all need to be pit crews** and not cowboys or cowgirls.”

- Dr. Atul Gawande

New 2013 OECD “Survey of Adult Skills” shows the 21<sup>st</sup> century skills gap that exists for America. **And on most domains, scores are lower for younger Americans than older Americans.**

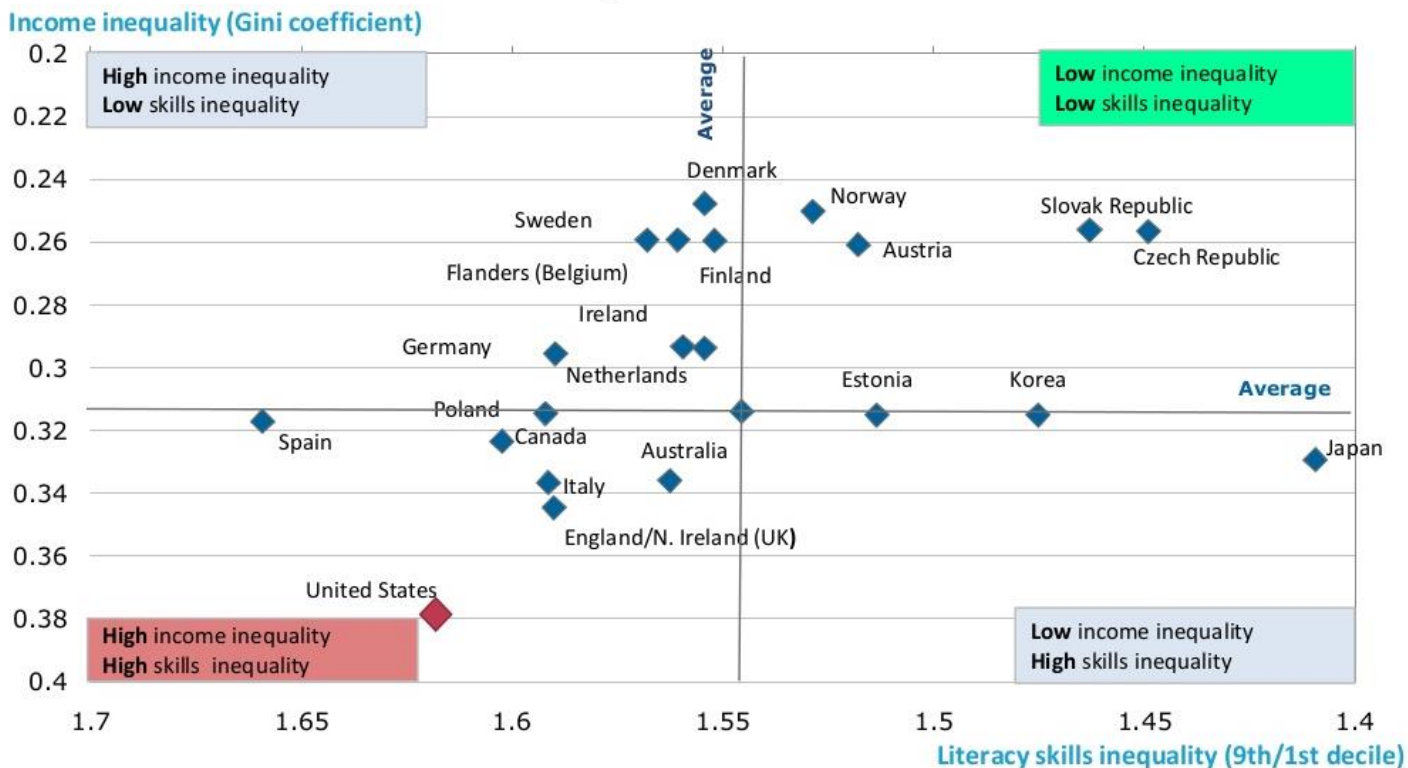


Source: Organization for Economic Cooperation and Development; graphic by *New York Times*



American results are among the most polarized between high achievement and low. Compared with other countries with similar scores, America has more people in the highest proficiency levels and more in the lowest levels.

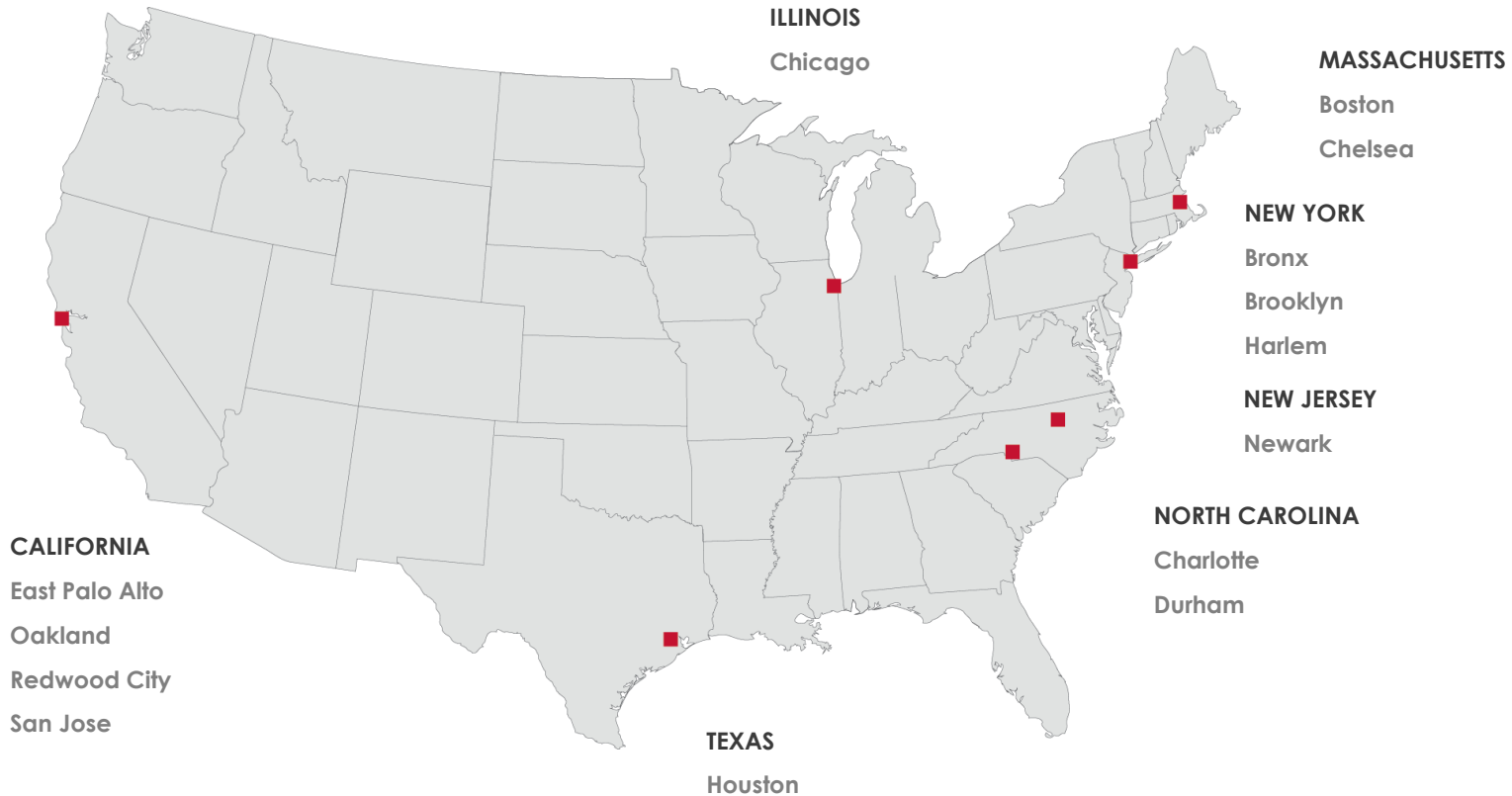
## Inequality in the distribution of income and literacy skills



Source: Organization for Economic Cooperation and Development; graphic by New York Times

# Citizen Schools' Partnerships From Coast to Coast

7 states ▪ 32 schools ▪ 14 communities ▪ 5,300 students  
244 AmeriCorps members ▪ 4,700 Citizen Teacher volunteers



# The Citizen Teacher Journey...



**Sign Up**  
Complete application, background check and select training date. Work with a staff member to choose a campus and a topic to teach.



**Get Trained**  
Meet your staff partner. Learn how to work with middle school students. Learn how to model skills. Finalize apprenticeship and WOW! plans.



**Teach**  
Get to know your students. Share your career pathway. Model and teach skills. Invite a guest speaker. Prep for WOW!



**WOW!**  
Students demonstrate the skills they've mastered. Invite friends, family, coworkers to attend. Celebrate accomplishments.



**Celebrate**  
Reflect on student success. Complete Citizen Teacher survey. Follow us on Facebook, Twitter, and LinkedIn.



**Advocate**  
Share your apprenticeship story on our website and with your network. Sign up to teach again. Recruit a friend or colleague to teach. Donate. Attend future WOW! events. Host an event.

## A WEEK AS A TEACHING FELLOW

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	CAMPUS ROLE	CAMPUS ROLE	CAMPUS ROLE	CAMPUS ROLE	PROFESSIONAL DEVELOPMENT
	STAFF MEETING				
Program (about 3 hours)	SNACK AND CIRCLE	SNACK	SNACK	SNACK	
	AIM/ACADEMIC LEAGUE	AIM/ACADEMIC LEAGUE	AIM/ACADEMIC LEAGUE	AIM/ACADEMIC LEAGUE	
	COLLEGE TO CAREER CONNECTIONS	APPRENTICESHIPS	EXPLORATION	APPRENTICESHIPS	
	POST-PROGRAM STAFF MEETING	POST-PROGRAM STAFF MEETING	POST-PROGRAM STAFF MEETING	POST-PROGRAM STAFF MEETING	

Each Fellow specializes in one role in the school partnership, which they work on while the regular school day is in session:

- Family-Student Engagement Lead
- Citizen Teacher Lead
- Data Lead
- College Readiness Lead
- Academic Program Lead

Teaching Fellows work 50-55 hours per week.



## CITIZEN SCHOOLS PROGRAM ELEMENTS

### Academic League

Math & ELA lessons that align with material learned throughout the day

### AIM

Homework support and one-on-one grades and goals conferences

### Apprenticeships

Hands-on classes taught by volunteer professionals and community members

### Circle

Celebrate student achievement and practice collaboration skills

### College-to-Career Connections (C3)

Build study skills and college knowledge to make higher education a real and tangible option

### Exploration

Activities and field trips that reflect the needs and opportunities of communities





THE NATIONAL TEACHING FELLOWSHIP CLASS OF 2015 IS  
**READY TO SERVE!**



**We've hired a bright, diverse bunch!**

They represent 72 colleges and universities



and have an average undergrad GPA of 3.35



37% are STEM or Social Science Majors



40% speak a key language, such as Spanish

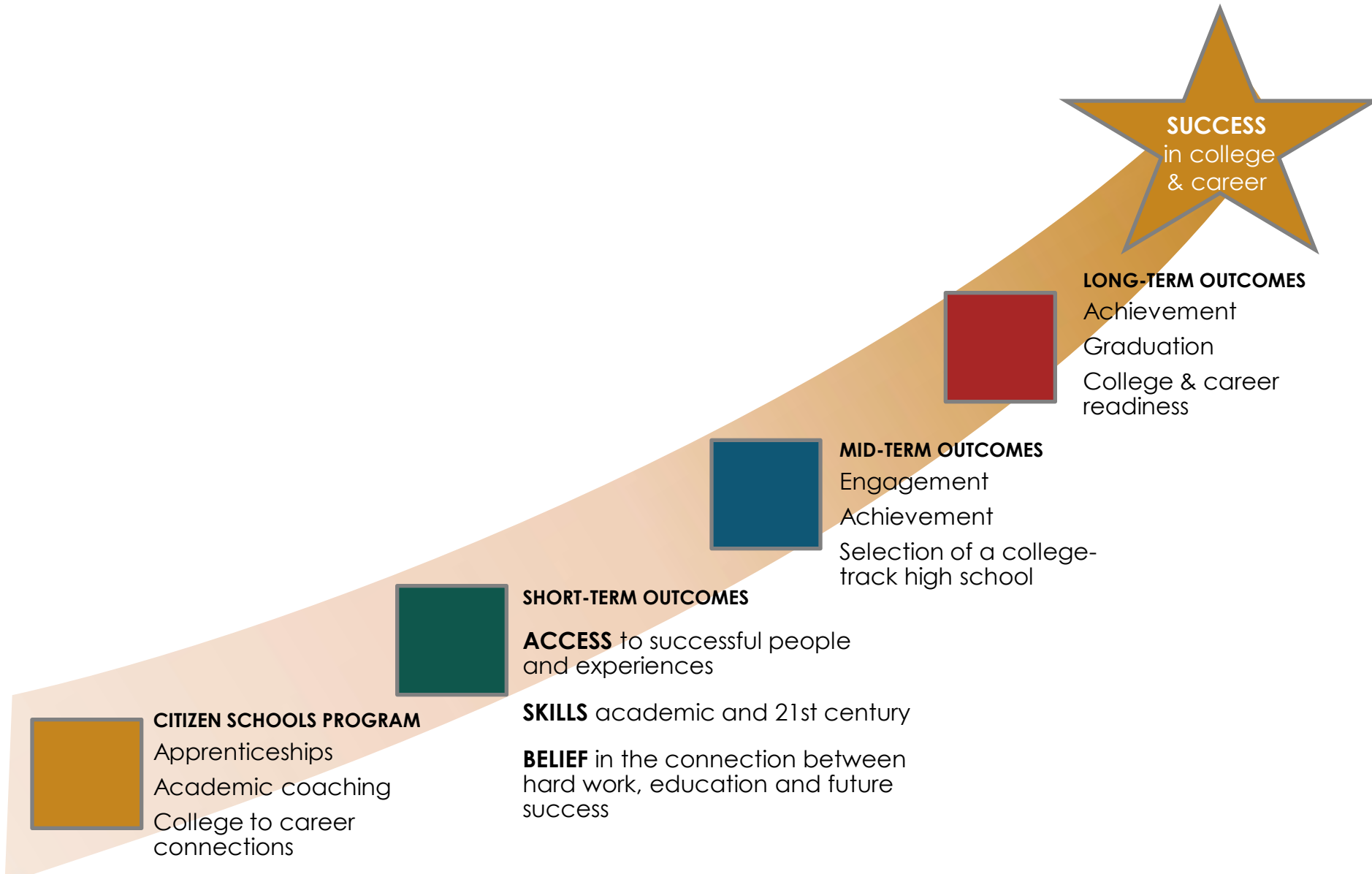


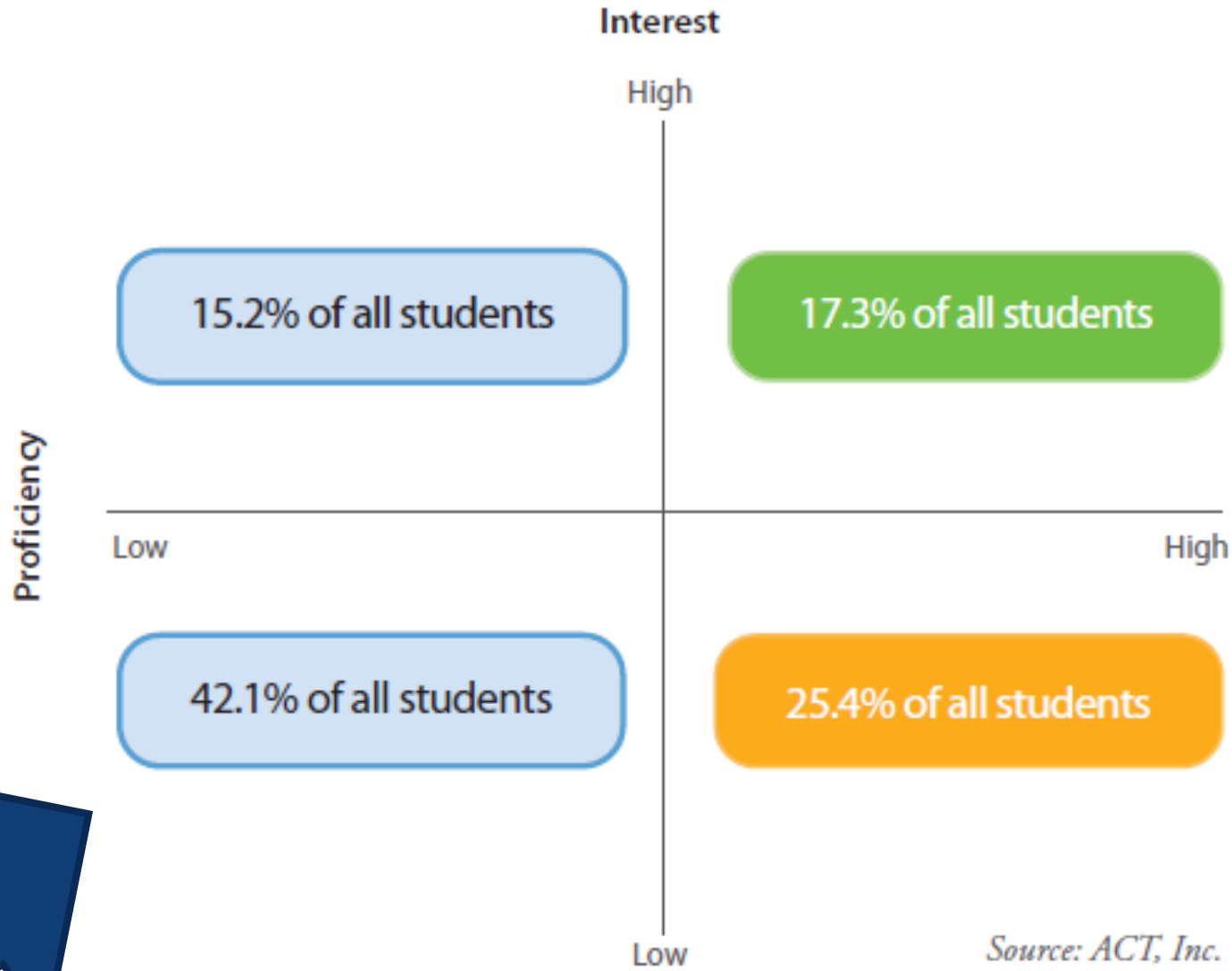
**53%** self-identify as a member of a minority group



**35%** are first generation college students







Students taking ACT test in 2008.

Source: ACT, Inc.

CT of the Year Alan Su, Google software engineer. Alan Su is an engineer at Google, making the tubes of YouTube run smoothly. But for years, he has also spent an afternoon a week engineering young minds. His latest apprenticeship with Citizen Schools involved teaching kids how to build robots, and then program Android phones to make them perform various tasks. Check out the journey they go on together:

[http://www.youtube.com/watch?feature=player\\_embedded&v=ijqDK2iERzQ](http://www.youtube.com/watch?feature=player_embedded&v=ijqDK2iERzQ)







Techno SWAG

10 after-school lessons  
- 30 minutes each  
- 1 afternoon a week  
- 100% all-changing

**CITIZEN SCHOOLS**

What will you teach?

www.citizenschools.org/1member

Be  
**YOUR SELF.**  
CITIZEN SCHOOLS

WOW! Student presentation with Boston Mayor Tom Menino:



Apprenticeship Sector: **STEM**  
Taught by: **David Mantus**  
Partner Organization: **Cubist  
Pharmaceuticals**

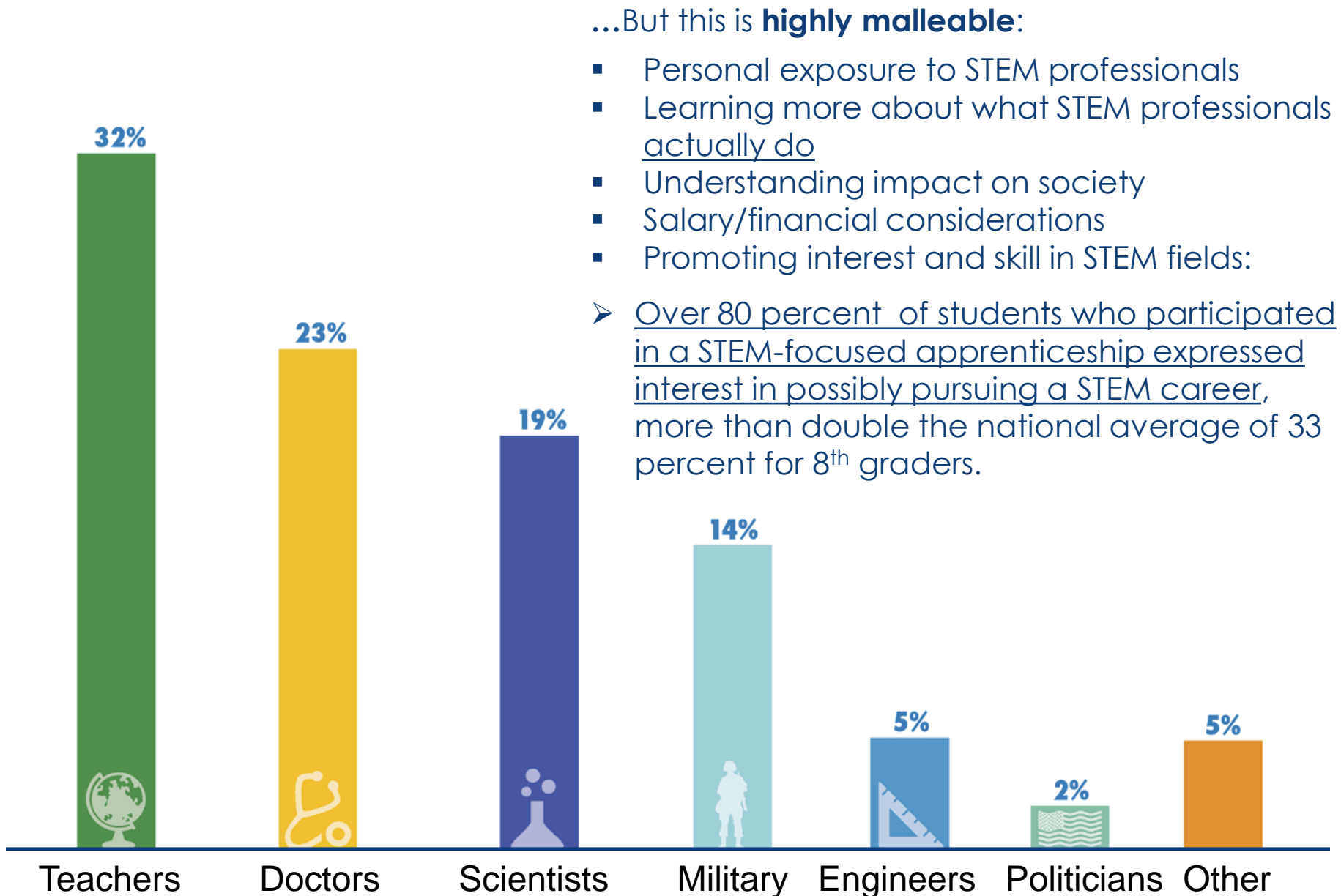


**Apprenticeship curriculum:**  
Students learn the basic concepts of physics and apply that knowledge to understanding both the possibilities and challenges of space travel.

**WOW!:** Students are given a distance-learning mission with the Challenger Learning Center and communicate live with scientists at the Center to complete the mission.



# Middle Schoolers' View of Society's Top Contributors



“It was great to see my middle school apprentices have perhaps their first-ever experience with *telling* technology what to do, rather than just listening to what technology tells them.”

**- Citizen Teacher, Fall 2012**

Apprenticeship Name & Description	My Rank	My Reasons
<p><b>Carbon Footprint</b> Students will learn to effectively present the findings of their research and analysis of the Carbon Footprint of their school. Students will collect their own data using several focused research questions, and present an action plan to their school based on what they have learned. The experience of developing local solutions to global problems is empowering for students and also provides a context for understanding how data can be used to share information with others, which is a valuable skill for a wide range of career and college pathways.</p>	<p>1 2 3</p>	<p>I love science and experiments and I also want to be a doctor and science is a big part of doctoring.</p>
<p><b>Generation Technology (NASA)</b> Wire up with generation technology! In this Apprenticeship you will learn the basics about electricity and power generation through a series of hands-on experiments including resistance, voltage, current, create circuits, and build simple electronic devices. For the WOW! you will build your own electric power source machine!</p>	<p>1 2 3</p>	<p>Space is a big part of my life, I was also in a space exploration project last year so I real like space.</p>
<p><b>CHESS</b> Students will learn strategies and how to play chess. You will gain a clear understanding of how to use each piece and its specific significance.</p>	<p>1 2 3</p>	<p>I have played chess before and it is not very intreshny to me.</p>





“In 6<sup>th</sup> grade everything was hard, it seemed like everyone was smarter than me. I was failing in Math and struggling in other classes. I decided to do something about it this year in 7<sup>th</sup> grade.

**...My teachers are helping me make better choices, and I'm seeing the progress.** I'm proud to tell you that I now have a B in Math. Because I have a better expectation of myself, I hope I'll have an A soon! My mom always said when I leave her house I'm going to be a decent man and I know all my teachers have the same expectation of me. **A year ago I didn't believe it myself but today I do.”**

**- Jason Ponce, Citizen Schools student in New York City**



A substantial and growing portfolio of evidence, including rigorous external evaluations, demonstrates that **Citizen Schools partnerships are closing the opportunity and achievement gaps:**

## ENGAGEMENT

Citizen Schools **attendance is higher** than matched peers, reducing absenteeism by 43%.

70% of students at Citizen Schools ELT campuses report that they have the **opportunity to learn about college and careers during the school day**, nearly double the rate for their matched peers.

## MIDDLE SCHOOL ACHIEVEMENT

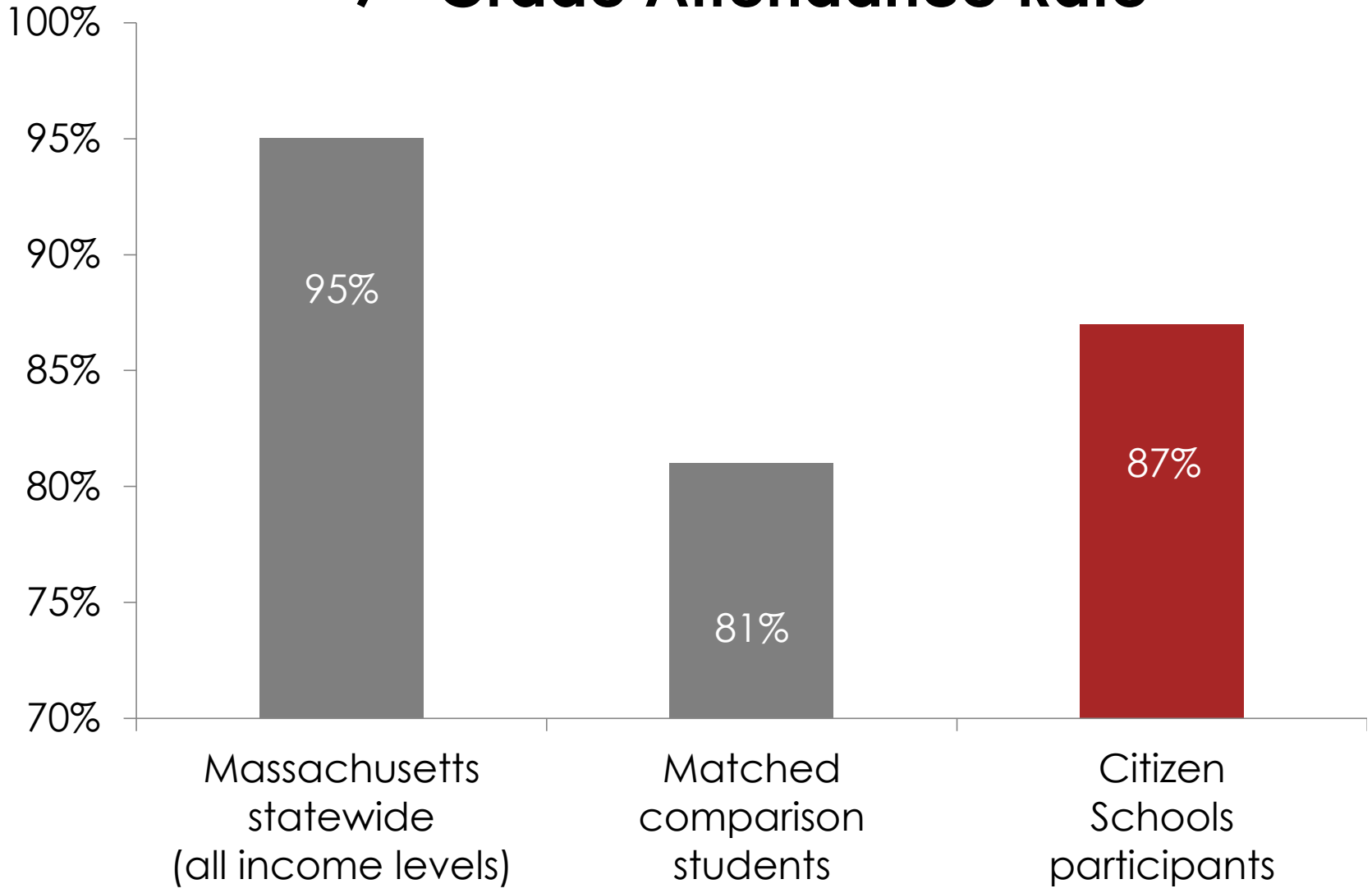
Preliminary results from the evaluation of Citizen Schools' national ELT initiative found an annual effect of Citizen Schools of **four additional months of learning gains in Math** and **five additional months of learning gains in English**.

## COLLEGE READINESS & SUCCESS

**Nine out of 10 Citizen Schools alumni passed** state high school exit exams in math and English, closing the achievement gap in high school. Citizen Schools alumni achieved an **on-time high school graduation rate 12 percentage points higher** than matched peers.

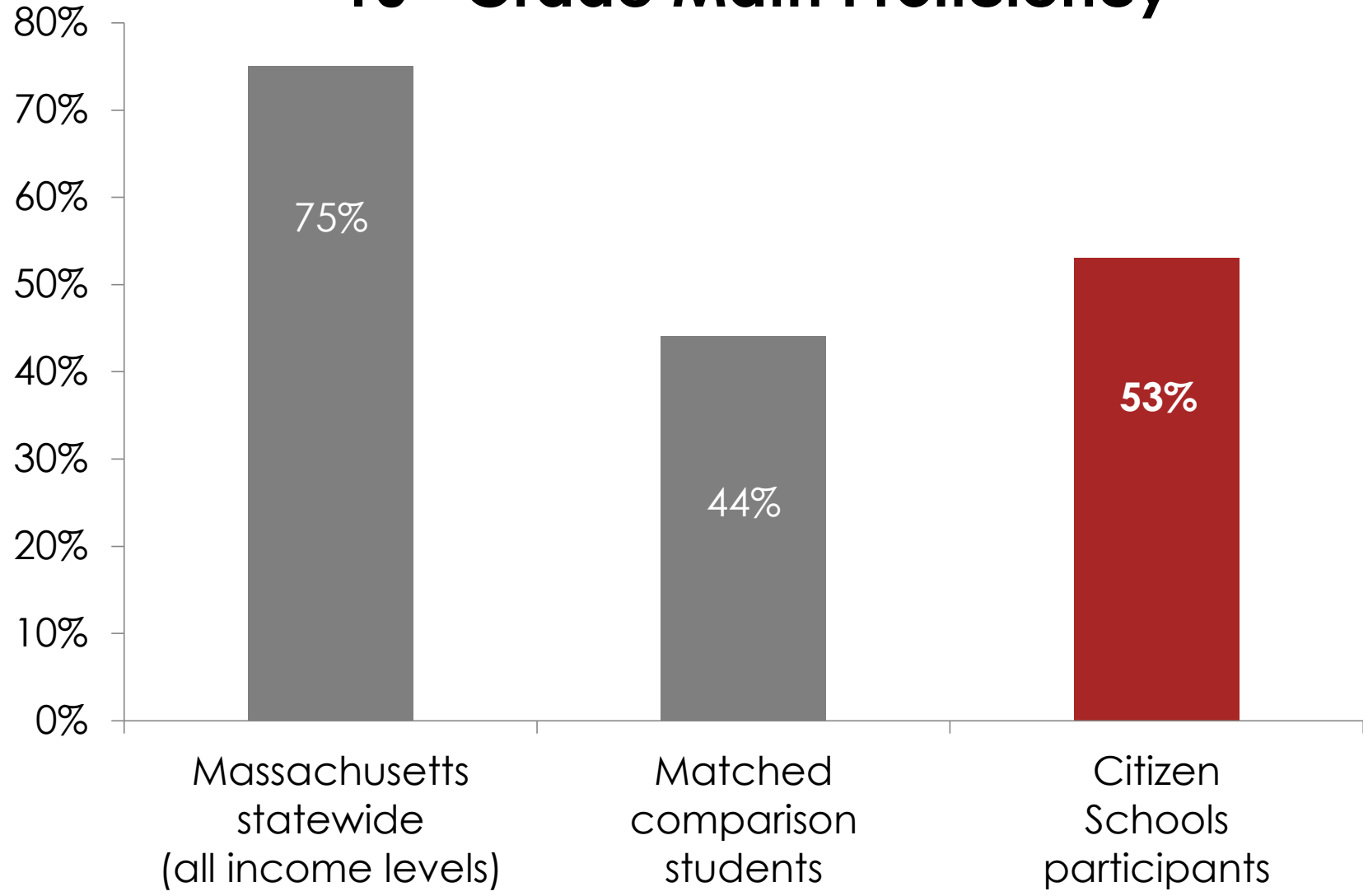
Citizen Schools alumni are **enrolling in college** at the same rate (62%) as students in the U.S. from all income levels and 1.5 times the rate for their low-income peers nationally, closing the achievement gap for college enrollment.

# 9<sup>th</sup> Grade Attendance Rate



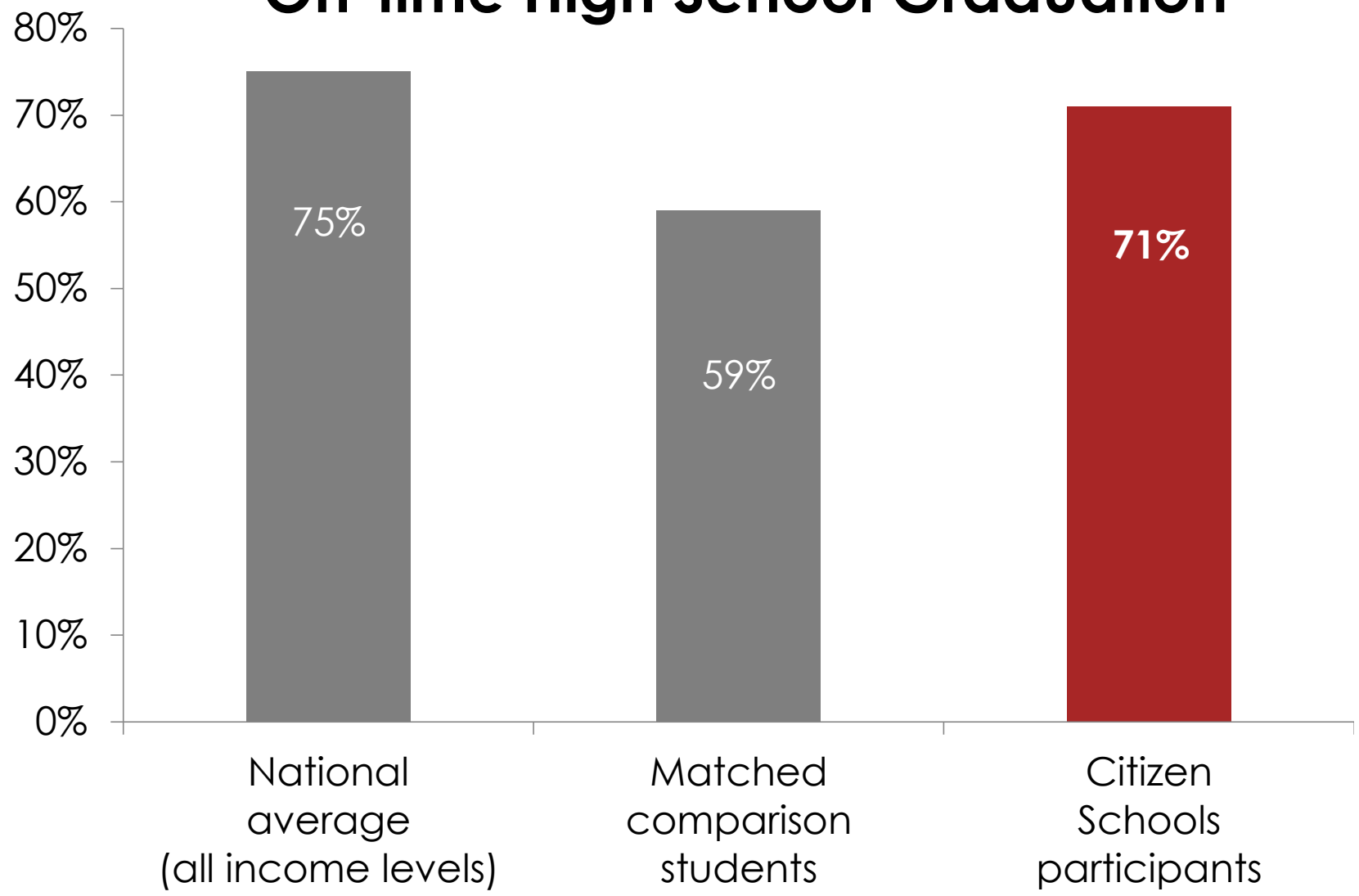
Source: Policy Studies Associates. 2010. *Achieving High School Graduation: Citizen Schools' Youth Outcomes in Boston.*

# 10<sup>th</sup> Grade Math Proficiency



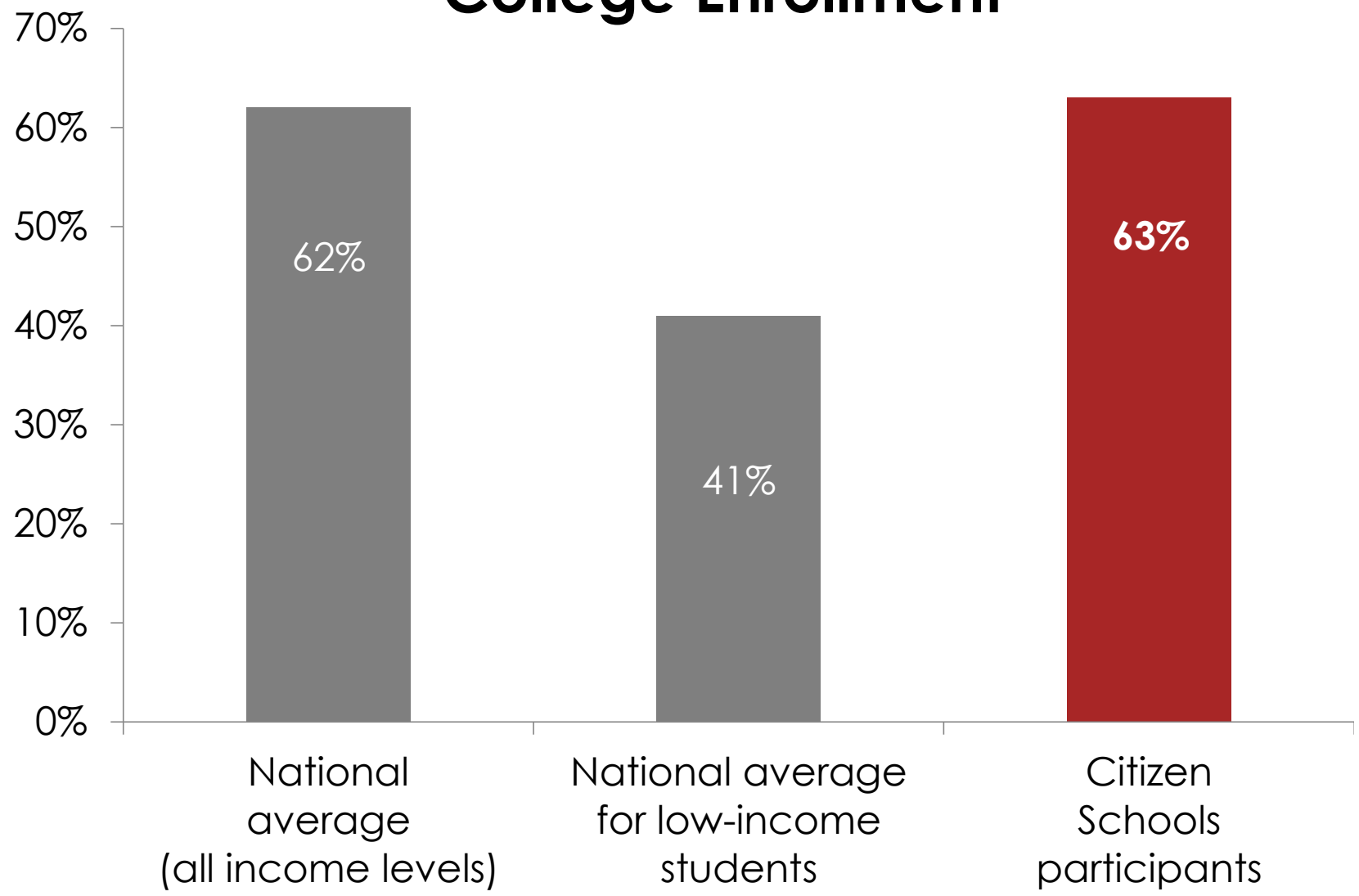
Source: Policy Studies Associates. 2010. *Achieving High School Graduation: Citizen Schools' Youth Outcomes in Boston.*

# On-time High School Graduation



Source: Policy Studies Associates. 2010. *Achieving High School Graduation: Citizen Schools' Youth Outcomes in Boston.*

# College Enrollment



Source: Citizen Schools. 2013. Citizen Schools College Success Report.

Updated student and teacher survey results through the 2012-13 school year demonstrate striking, statistically significant differences between Citizen Schools ELT and matched comparison schools, particularly on elements driven by the Citizen Schools program model.

## Selected Significant Student Survey Results:

	Percent of Respondents		Estimated Difference
	Actual CS ELT Mean N size = 249	Estimated Matched Comparison (MC) Mean N size = 588	
<i>Questions asked of all Citizen Schools students &amp; matched comparison students</i>			
Total time spent at school on a typical day	10 hours	8 hours	+2 hours
Activities to learn about college	70%	38%	+32%***
Activities to learn about careers	67%	40%	+27%***
	Percent of Respondents		Estimated Difference
	Actual CS ELT Mean N size = 249	Estimated MC Mean N size = 385	
<i>Questions asked of all ELT and MC students in after school programs: My after school activities help me...</i>			
Learn about helping others in my community	80%	68%	+12%*
Learn about how to get into college	88%	71%	+17%***
Learn skills that will help me get a job	87%	76%	+11%*
Learn about different jobs or careers	89%	73%	+16%***

Statistical significance levels: \* p<.05; \*\* p<.01; \*\*\* p<.001; \*\*\*\* p<.0001

## Selected Significant Teacher Survey Results:

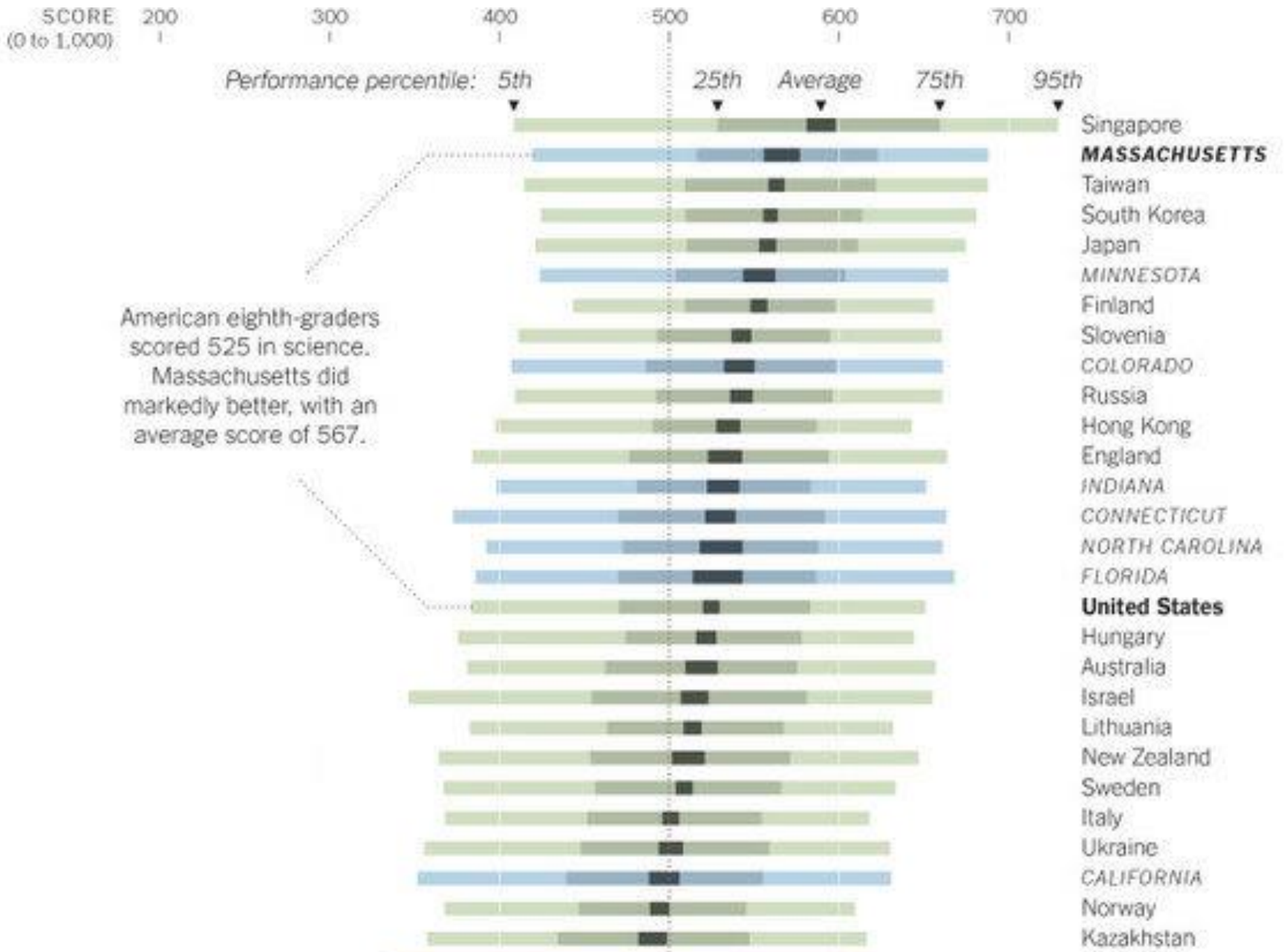
	Percent of Respondents		Estimated Difference
	Actual CS ELT Mean	Estimated MC Mean	
	N size = 173	N size = 196	
<i>Questions asked of all ELT and matched comparison teachers</i>			
Time available for students to pursue topics of interest to them	54%	33%	+21%**

	Percent of Respondents		Estimated Difference
	Actual CS ELT Mean	Estimated MC Mean	
	N size = 173	N size = 192	
<i>Questions asked of all ELT teacher and matched comparison teachers <u>reporting on after school programs</u> (smaller n sizes)</i>			
Teachers and after school staff successfully collaborate to support students	76%	55%	+21%**
Communication and collaboration between teachers and after school staff	63%	43%	+20%***
After school activities are of high quality	86%	59%	+27%**
Teachers in this school discuss their expectations for homework with after school staff.	73%	47%	+26%**

Statistical significance levels: \* p<.05; \*\* p<.01; \*\*\* p<.001; \*\*\*\* p<.0001

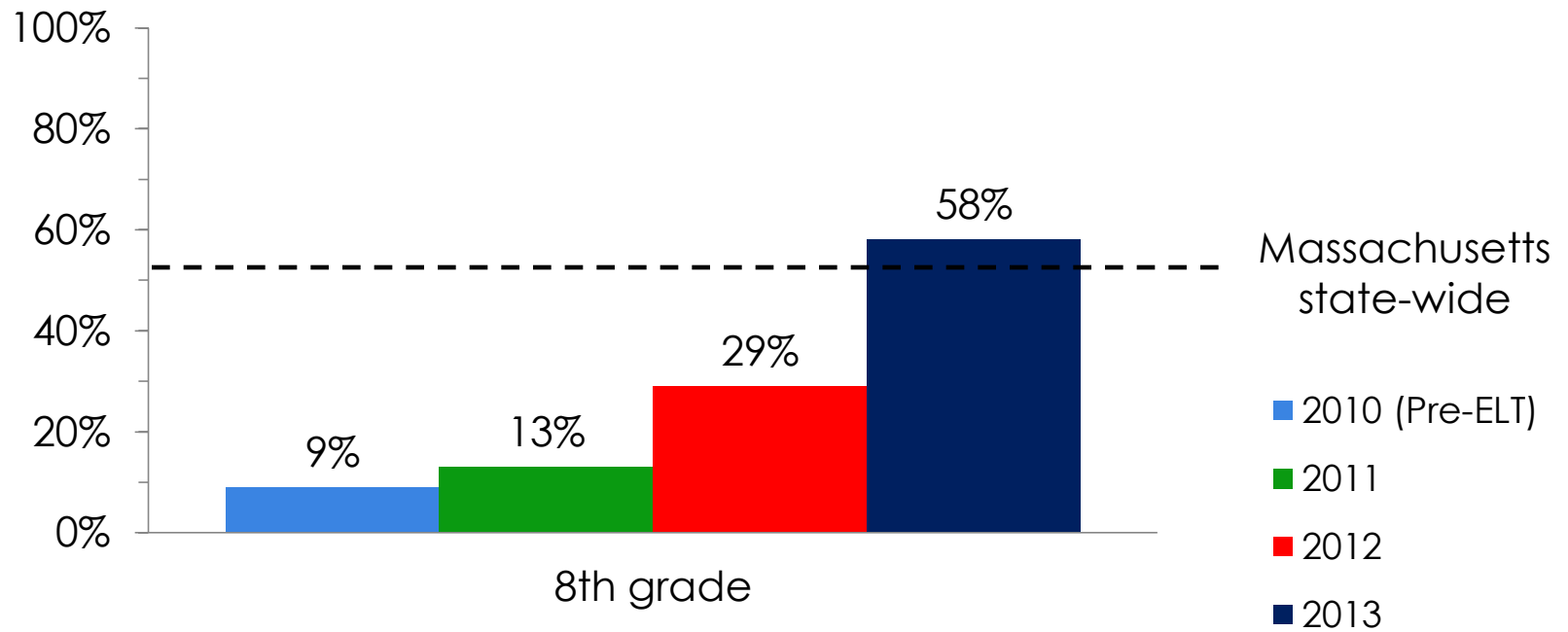


# Massachusetts would be the 2<sup>nd</sup> highest performing **country** in Math worldwide in science



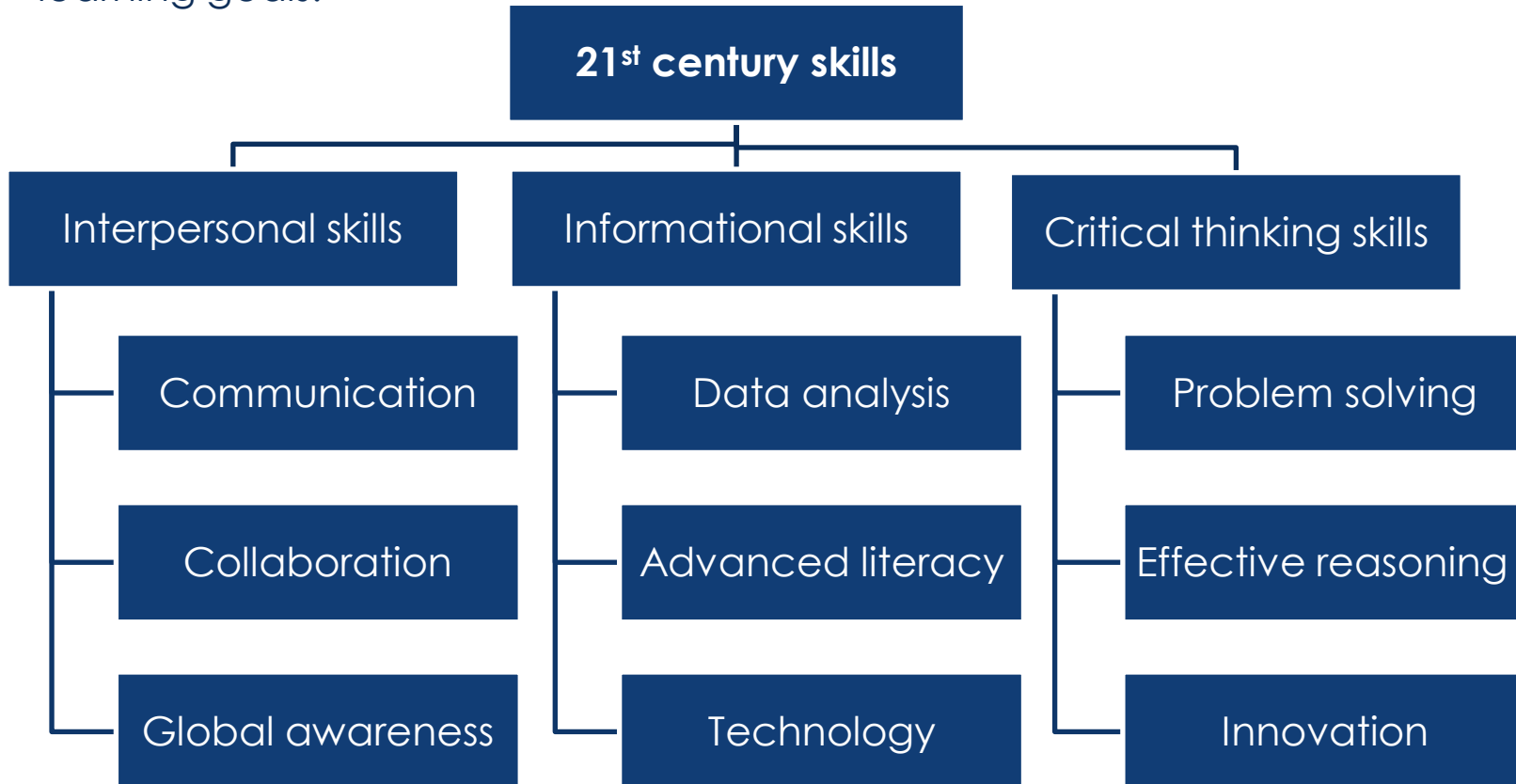
The 8<sup>th</sup> grade class of 2012-13, the first 8<sup>th</sup> grade cohort to have participated in Citizen Schools ELT as 6<sup>th</sup> graders, erased the achievement gap in Math relative to their peers statewide in Massachusetts.



## Math Proficiency Rate



In 2012-13, **69% of Citizen Schools' students demonstrated growth in 21<sup>st</sup> century skills** (oral communication and leadership).

In 2013-14, Citizen Schools will **refine and pilot** enhanced 21<sup>st</sup> century skills measures to measure student's growth and mastery of a broader set of 21<sup>st</sup> century skills critical to college and career readiness and aligned with STEM learning goals.



← → ↻ <https://sat1.sbactpt.tds.airast.org/Student/Pages/TestShellModern.aspx> ☆  

🔍 🔍 📊

ZOOM IN ZOOM OUT CALCULATOR

📄 ⏸ ⏪ ⏩

SAVE PAUSE BACK NEXT

**CEREAL BOXES**

A cereal company uses cereal boxes that are rectangular prisms. The boxes have the dimensions shown.

- 12 inches high
- 8 inches wide
- 2 inches deep

The managers of the company want a new size for their cereal boxes. The new boxes have to be rectangular prisms. You will evaluate one box Passage design the company proposed. Then you will create and propose your own design for the company.

- Requirements for the new boxes:
- The new boxes have to use less cardboard than the original boxes.
  - The new boxes have to hold the same or a greater volume of cereal as the original boxes.

The company proposes a new cereal box with dimensions 10.5 inches high, 7.5 inches wide, and 4 inches deep. The new cereal box is a rectangular prism. Determine if this new box meets each of the requirements. Explain why or why not.

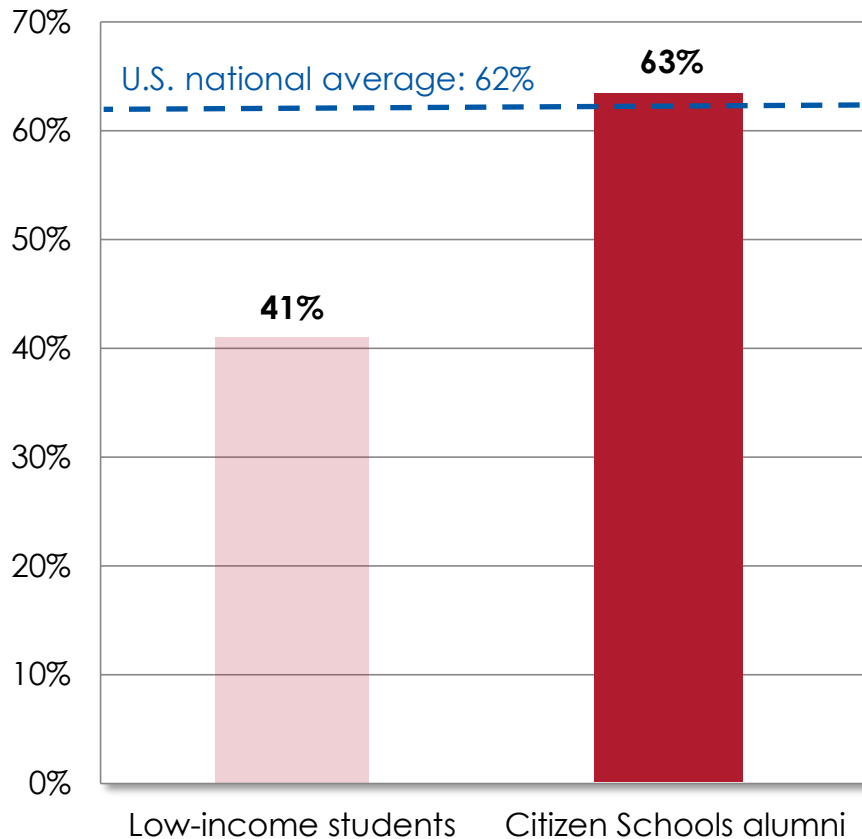
**5**   

Design a new cereal box for this company. All cereal boxes are rectangular prisms. Then explain why your design is better for the company, based on the requirements.

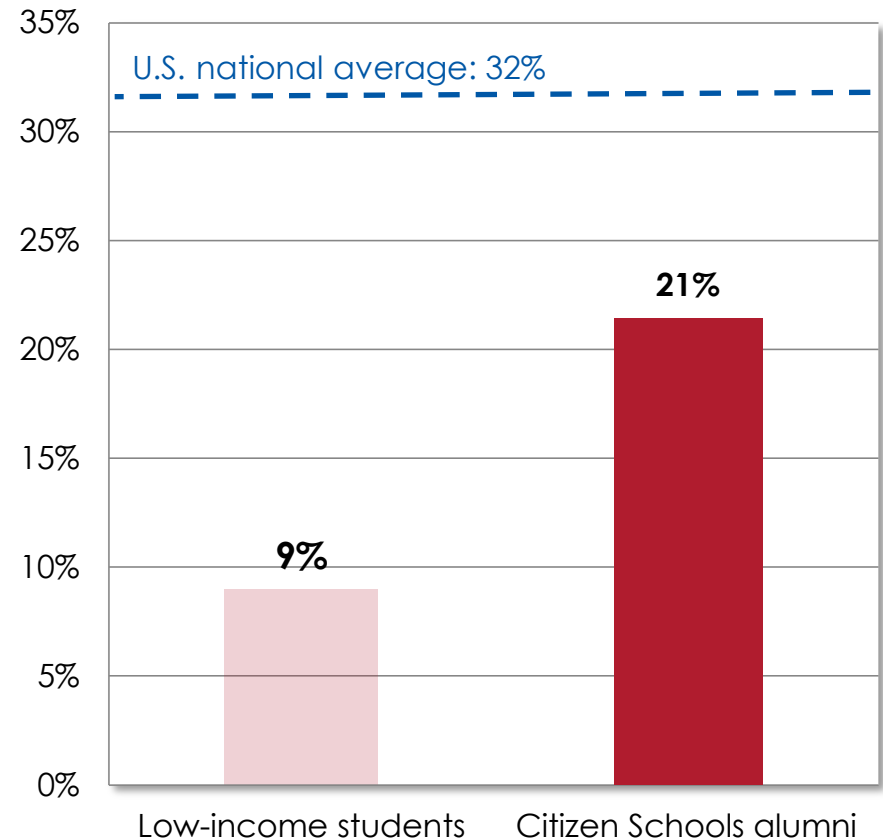
- In your response,
- give the dimensions of your box;
  - explain how your box meets each of the requirements for new boxes.

- Nationally, **only 9 percent of low-income students earn a four-year college degree by age 25**, which is *8 times less than their peers from high-income families*.
- Citizen Schools alumni **enroll in college** at the same rate as students in the U.S. from all income levels and 1.5 times higher than for their low-income peers. The **graduation rate** is more than double the national rate for low-income students.

% students **enrolled in college**



% students **earning a college degree**  
by age 25





MacCalvin Romain's Overview [LinkedIn](#)

**Current**

- Senior Technology Analyst at Digitas
- Curator at TEDxBeaconStreet
- Data Collection Subcommittee at Massachusetts Science Technology Engineering Mathematics (STEM)
- CEO and Co-Founder at Swag Media Entertainment
- Volunteer - Citizen Teacher/Ambassador at Citizen Schools

[see less](#) ^

**Past**

- Associate Business Consultant at EMC Corporation
- Senior Student Technology Specialist at Boston College: Information Technology Services
- Technical Intern at Fidelity Investments

**Education**

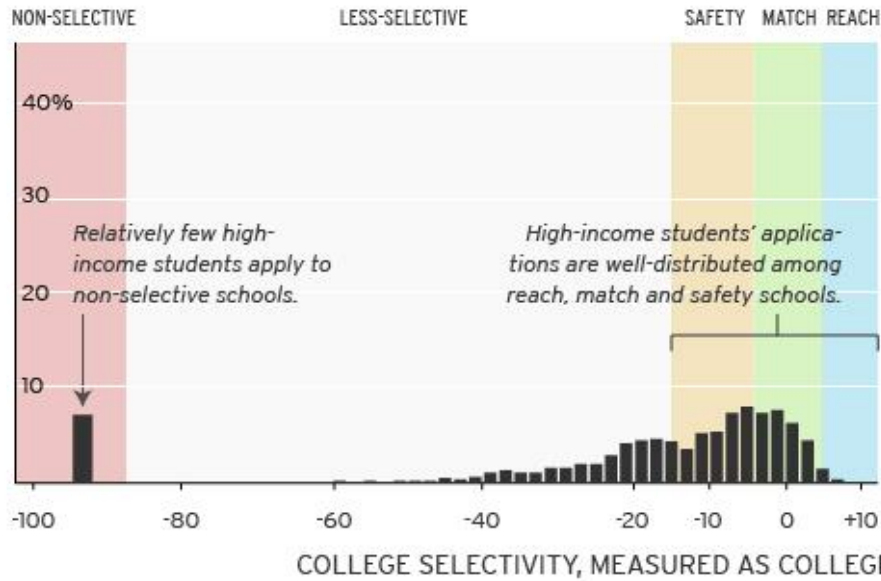
- Boston College
- Boston Latin School

**Recommendations** 1 person has recommended MacCalvin

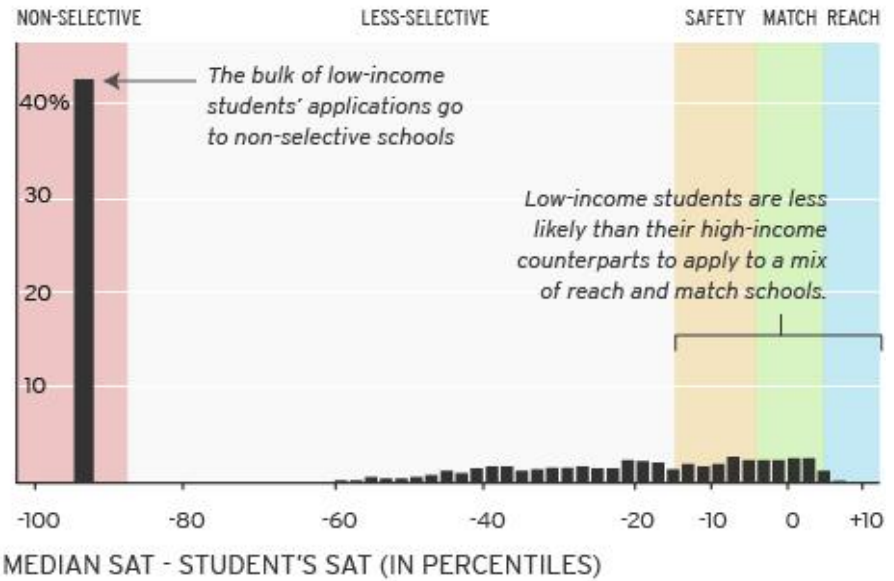
**Connections** 500+ connections

**Websites** My Tedx Boston Talk

## HIGH-INCOME STUDENTS' PORTFOLIOS OF COLLEGE APPLICATIONS



## LOW-INCOME STUDENTS' PORTFOLIOS OF COLLEGE APPLICATIONS



Source: Hoxby & Avery, 2013.

## Tiana, Ithaca College

- A Posse Scholarship winner, graduated with honors from Codman Academy.
- Her first semester at Ithaca College was an academic shock for this high-achieving student. “It was my worst academic performance ever.” She earned arning Bs and Cs in classes in courses like anatomy and physiology, which she needs for her exercise science degree.
- Ithaca, a private liberal arts institution serving approximately 6,000 undergraduates, was a big adjustment for Tianna after graduating from a high school with fewer than 50 seniors at Codman, a charter high school in Dorchester.
- Although Tianna considered transferring to a school closer to home, she views her academic struggles first semester as a learning opportunity to help her grow. “You will fail at something, you'll adjust the things you do and you'll get better at it. That's the big thing. You've got to learn it and get through it.”
- Tianna's already taken the first steps to improve her grades by seeking out two tutors and building an academic support network with other exercise science majors on the basketball team.

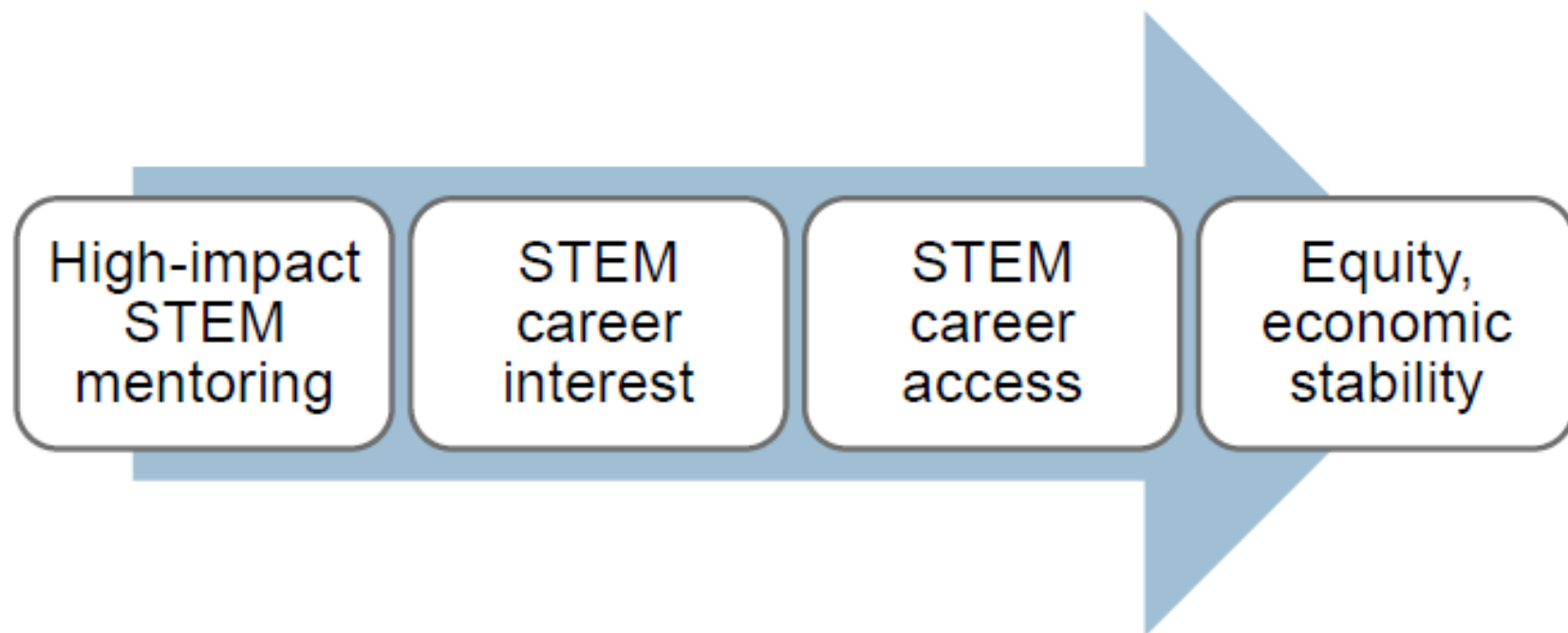


### Roobvia, College of the Holy Cross

- Roobvia earned several scholarships and a substantial financial aid package from her university and shares that she is "lucky to be financially stable".
- She participated in the one-week Odyssey program, which connects incoming international students and students of color to faculty members and organizations which will support their college transition.
- In her first year, earned a B average as a pre-med and music double major.
- She attends office hours regularly, forms study groups and "rewrites her notes until they are memorized"

# US2020: Moments of Discovery

Our guiding theory: experiential, sustained engagement with underserved students



For more information, visit:  
<http://us2020.org/city-competition/>

# US2020: High-Impact Mentoring

US2020 supports mentoring engagements that include these elements

Underserved  
K-20 students

In- or Out-of-  
School- Time

About 20 hours  
per volunteer

STEM  
professionals

Hands-on  
learning

Measure  
student interest,  
participant  
satisfaction

For more information, visit:  
<http://us2020.org/city-competition/>

# US2020: Movement-Building

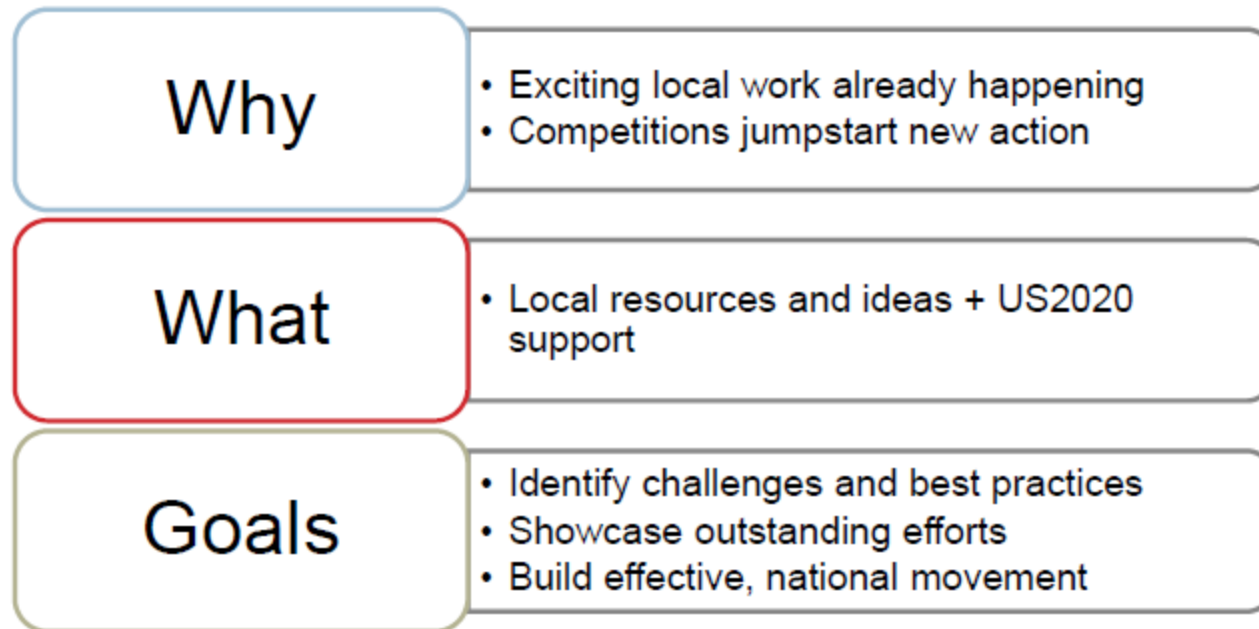
- Our goal: 1 Million Mentors
- Building a movement
  - Presidents Obama and Clinton, CTO Todd Park
  - Cisco, Cognizant, SanDisk, Tata Consultancy Services



For more information, visit:  
<http://us2020.org/city-competition/>

**US2020**  
Igniting Moments of Discovery

## City Competition: Overview



For more information, visit:  
<http://us2020.org/city-competition/>

# City Competition: Why apply?

## Benefits to applicants



### **\$1M package (cash and in-kind) split between 3-5 cities**

- \$50,000 cash + \$50,000 match
- 3-5 service corps members
- Online platform
- Consulting services



### **Value added for all participants**

- Action catalyzed within community
- Implementable plan
- Recognition as STEM leader

For more information, visit:  
<http://us2020.org/city-competition/>

**US2020**

Igniting Moments of Discovery

Mike Kubiak, Chief Research & Evaluation Officer

Email: [michaelkubiak@citizenschools.org](mailto:michaelkubiak@citizenschools.org)

Twitter: @mikekoob



*We connect citizens to schools  
to connect students to their dreams.*