

# The Washington State Board of Education

Governance | Achievement | High School and College Preparation | Math & Science | Effective Workforce

<b>Title:</b>	<b>Washington STEM Partnerships</b>	
<b>As Related To:</b>	<input type="checkbox"/> Goal One: Advocacy for an effective, accountable governance structure for public education <input type="checkbox"/> Goal Two: Policy leadership for closing the academic achievement gap <input checked="" type="checkbox"/> Goal Three: Policy leadership to increase Washington's student enrollment and success in secondary and postsecondary education	<input type="checkbox"/> Goal Four: Effective strategies to make Washington's students nationally and internationally competitive in math and science <input type="checkbox"/> Goal Five: Advocacy for policies to develop the most highly effective K-12 teacher and leader workforce in the nation <input type="checkbox"/> Other
<b>Relevant To Board Roles:</b>	<input type="checkbox"/> Policy Leadership <input type="checkbox"/> System Oversight <input checked="" type="checkbox"/> Advocacy	<input checked="" type="checkbox"/> Communication <input type="checkbox"/> Convening and Facilitating
<b>Policy Considerations / Key Questions:</b>	How can Washington STEM work with the state to scale up innovative and evidence-based STEM teaching and learning practices to improve science achievement?	
<b>Possible Board Action:</b>	<input checked="" type="checkbox"/> Review <input type="checkbox"/> Adopt <input type="checkbox"/> Approve <input type="checkbox"/> Other	
<b>Materials Included in Packet:</b>	<input type="checkbox"/> Memo <input type="checkbox"/> Graphs / Graphics <input checked="" type="checkbox"/> Third-Party Materials <input type="checkbox"/> PowerPoint	
<b>Synopsis:</b>	<p>Washington STEM is a nonprofit organization created through the collaboration of business and philanthropic leaders to “cultivate and spread breakthrough approaches in effective STEM (science, technology engineering and mathematics) teaching and learning so that students are prepared to succeed in the 21<sup>st</sup> century.” The organization’s first Executive Director, Julia Novy-Hildesley, hired in 2011, will share the vision for Washington STEM, how it is supporting and promoting achievement in STEM-related fields, and how it is collaborating with an array of partners (including the state) to support state STEM-related directions. For instance, Washington STEM staff helped shape Washington’s successful application to be a lead partner state in the development of the Next Generation Science Standards. The Lead Partner States will guide a national team to write standards based on the <i>Framework for K-12 Science Education</i> developed by the National Research Council, and will also work together to develop plans for adoption, implementation, and transition that can be considered by other states.</p> <p>Washington STEM is a unique Washington resource that is pulling together expertise, financial support, and creative thinking to improve STEM education. Currently, Washington STEM offers three levels of investment:</p> <ul style="list-style-type: none"> <li>• One-year, “micro-investment” entrepreneurial awards (given to educators who are “pioneering breakthrough approaches to STEM teaching and learning).</li> <li>• Three-year, “mid-size” portfolio investments (Bellevue School District is the only school district awarded to date).</li> <li>• Multi-year learning networks intended to “generate new knowledge, foster collaborative learning, and support struggling schools.”</li> </ul>	

**Washington STEM** is a nonprofit organization created to cultivate and spread breakthrough approaches in effective STEM (science, technology, engineering, and mathematics) teaching and learning so that students are prepared to succeed in the 21st century.

Washington STEM mobilizes education, business, and civic leaders to advocate for and implement STEM programs that dramatically improve learning outcomes, create pathways for rewarding family-wage STEM careers, and prepare all students for success in today's science and technology-rich society.

Washington STEM will deploy a catalytic investment strategy to ensure all students—particularly those who have been historically underserved—are proficient in STEM disciplines. Investments will result in widespread implementation of instructional experiences that build conceptual and factual knowledge and are engaging and challenging to students of diverse backgrounds and cultures.

Washington STEM was conceived by business and philanthropic leaders throughout the state, with the support and input of education, civic, community, and industry stakeholders. Over an 18-month design period, the organization gathered input from over 500 state residents, including students, parents, education stakeholders, community groups, business leaders, minority group leaders, and elected officials, and consulted experts from across the nation to study national and local STEM education initiatives. Washington STEM has used the best of these ideas to create a plan that brings the most promising practices, programs, and policies to the forefront.

Lead funders Microsoft, the Boeing Company, the Bill & Melinda Gates Foundation, and McKinstry, among others, have already collectively committed nearly \$20 million in financial support to Washington STEM.

Washington STEM serves as a venture fund for improving STEM education through strategies that catalyze change and generate results:

- **INVEST:** Through a portfolio of investments, Washington STEM identifies and spreads innovative and evidence-based effective STEM teaching and learning practices.
- **GENERATE:** With our funded partners, Washington STEM generates and shares new knowledge about how to improve STEM education.
- **ENGAGE:** Through community engagement, Washington STEM expands and diversifies the network of partners working together to improve student success in STEM outcomes, including parents, educators, community leaders, and STEM professionals.
- **ADVOCATE:** Washington STEM contributes its investment and community-driven insights to advocate for and sustain improvements at scale through policy change.

## BOARD OF DIRECTORS

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Office Manager & Executive Assistant

## FACT SHEET

While Washington is home to institutions that have revolutionized the way people around our state and the world collaborate, cure diseases, and conserve our farmlands, far too many young people leave our PK-12 public schools unprepared to fully engage in our STEM-rich society. Previous attempts to improve STEM education and outcomes at scale have fallen short due to a variety of reasons, including the lack of instructional time, an insufficient supply of effective STEM teachers, the absence of curricula that are both rigorous and inspiring, low public demand for improvements and the absence of a statewide network accelerating the discovery and sharing of promising practices.

The following facts about Washington illustrate the disconnect between our state's economic prowess, driven in large part by STEM industries and the human capacity to innovate, and our state's lagging education outcomes, and indicate the substantial need for Washington STEM's leadership and services in our state and our country.

- ❖ Washington state is a national leader for innovation, entrepreneurship, research, and high-tech industries ranking second in the nation for innovation, first for creation of new software companies, and seventh for receipt of R&D expenditures.
- ❖ Washington ranks fourth in the country in technology-based corporations, but falls to 46th when it comes to participation in science and engineering graduate programs.
- ❖ By 2018, 67 percent of jobs in Washington are projected to require some form of post-secondary education. Nearly one-quarter of projected job openings statewide through 2012 that require a bachelor's degree will be in computer science, engineering and life sciences, combined. Less than five percent of post-secondary STEM degrees are earned by students of color.
- ❖ Washington ranks 46th in the nation in terms of the likelihood of a student being enrolled in college by age 19. Less than half of high school students have even completed the necessary credits to apply to a Washington state four-year college. Lack of math courses is the biggest barrier to college for most students: only 21 percent of students had the needed math credits compared to 64 percent in English.
- ❖ Among Washington's community college students, roughly 52 percent are in remedial, non-credit-bearing courses, most often in math. Remediation rates are even higher for students of color. In 2005-06, Washington state spent \$17.2 million to remediate recent high school graduates in two-year community and technical colleges.
- ❖ University STEM teacher preparation programs in Washington are not producing enough teachers to meet the projected rise in demand in coming years, or to allow districts and administrators to hire selectively.
- ❖ Washington's fourth grade teachers report spending less than 20 minutes per week teaching science, the lowest instructional time in the country.

## FACT SHEET

- ❖ Only 44 percent of Washington's fourth-graders and 36 percent of eighth-graders scored proficient or above in math on the 2009 National Assessment of Educational Progress. Just 29 and 33 percent, respectively, scored that well in science.
- ❖ On the eighth-grade national tests, Washington is one of nine states in which the White-African American gap is growing, and one of seven states in which the White-Hispanic gap is growing. The gap in math achievement between Washington's low-income and higher-income students is the 12th largest in the nation.
- ❖ On a recent international assessment of 15-year olds' competencies and problem-solving skills administered in 65 countries around the world, US students ranked 31st in math (below international average), 23rd in science (roughly at international average) and 17th in reading (above international average).
- ❖ Highlights of the national results in science show that only 34 percent of fourth-graders, 30 percent of eighth-graders, and 21 percent of 12th-graders performed at or above the proficient level, demonstrating competency over challenging subject matter.

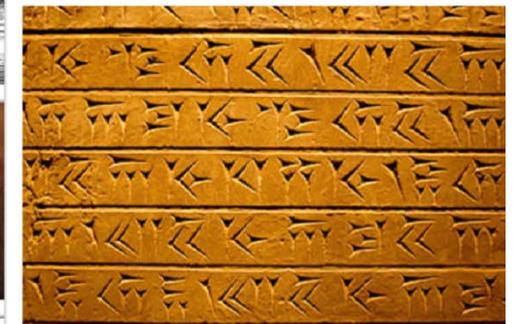
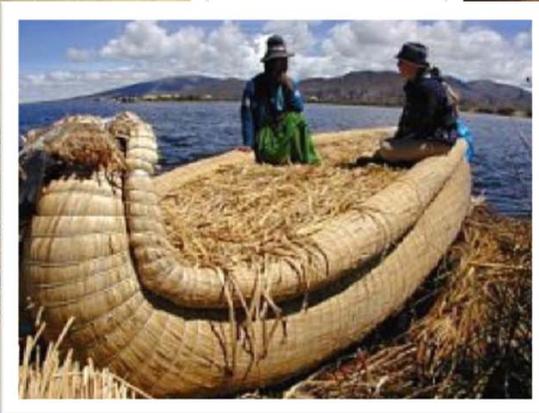
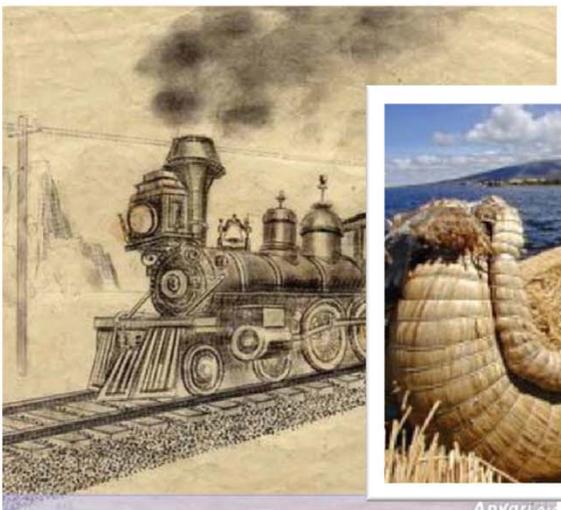
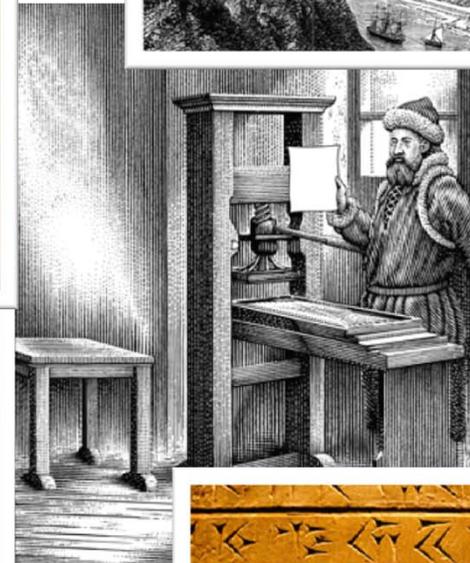
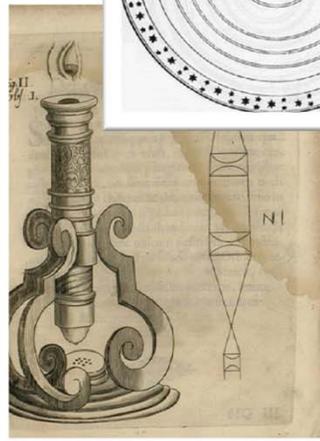
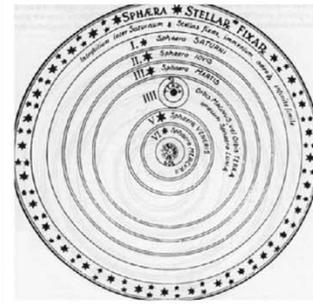


WASHINGTON  
 **STEM**  
ADVANCING SCIENCE, TECHNOLOGY,  
ENGINEERING AND MATH EDUCATION



**WHY STEM? WHY NOW?**

# WHY STEM? WHY NOW?



STEM

PASSPORT TO  
OPPORTUNITY

## STEM ECONOMY IN WASHINGTON TODAY

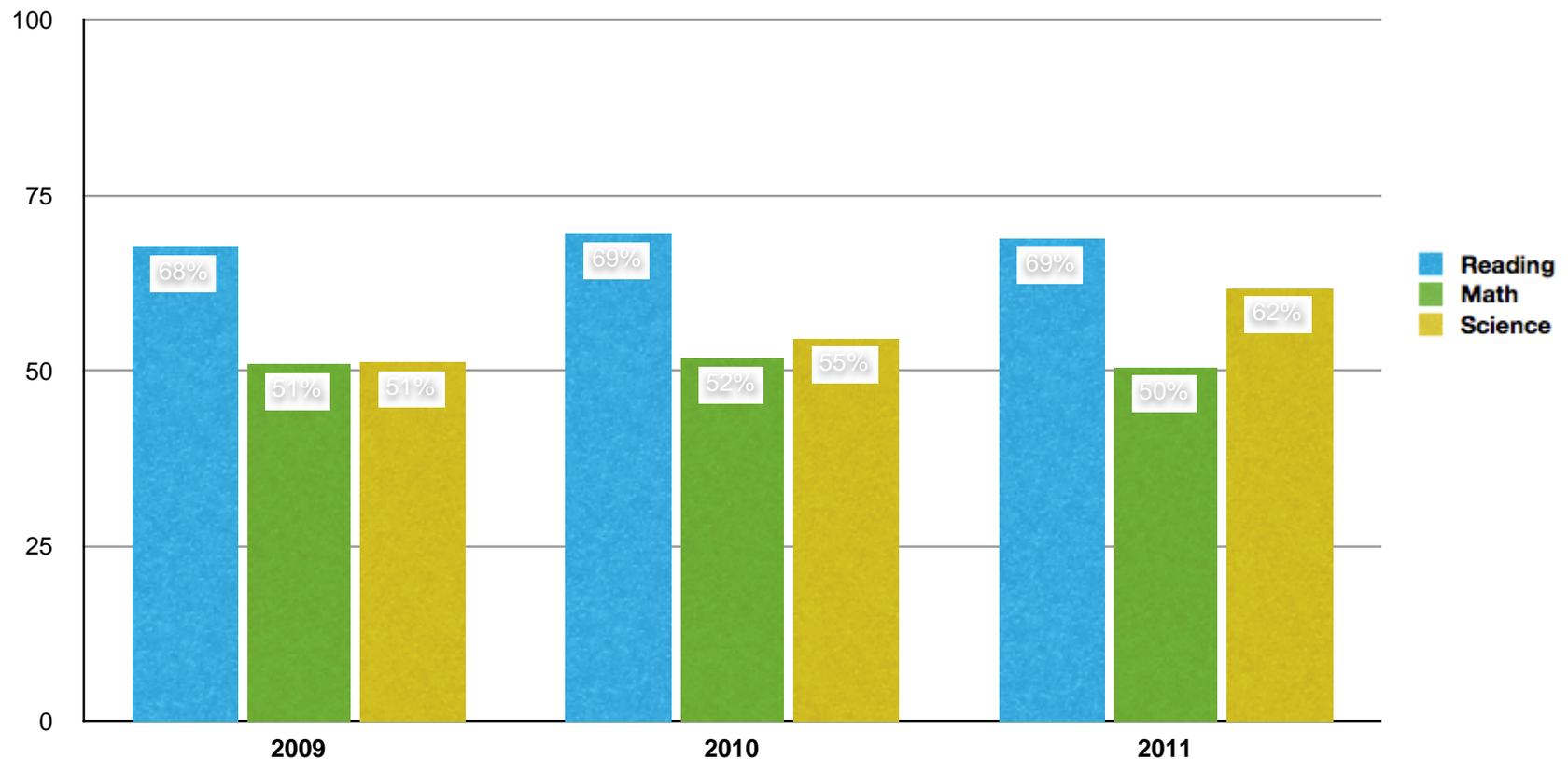
- 1<sup>st</sup>** Washington's rank in concentration of jobs in STEM
- 1<sup>st</sup>** Washington's rank in the creation of software companies
- 2<sup>nd</sup>** Washington's rank on the 2010 "New Economy" index for innovation and entrepreneurship
- 4<sup>th</sup>** Washington's rank in the nation in technology-based corporations

## STEM JOBS IN WASHINGTON 2018

- 8%** Total percentage of Washington jobs in 2018 that will be in STEM fields
- 24%** The increase in STEM jobs by 2018
- 7** Points Washington will score above the national average in STEM jobs
- 94%** Total percentage of 2018 STEM jobs that will require post-secondary education

# JUST HALF OF 8<sup>TH</sup> GRADERS MEET STATE STANDARDS IN MATH.

Percentage of Washington's 8<sup>th</sup> Graders Meeting State Standards by Year and Subject



## WASHINGTON'S ACHIEVEMENT GAP IN STEM IS LARGE AND GROWING.

In 8th grade math, Washington is:

**1 of 9** states where the White / African American gap is growing

**1 of 7** states where the White / Hispanic gap is growing

**1 of 18** states where the gap between low-poverty and high-poverty students is growing

“Our **mismatch** between the skills required for available jobs and individuals with those skills is **growing faster than all but one other state, Delaware.**”

- *Sen. Rosemary McAuliffe and Ed Lazowska, Bill & Melinda Gates Chair in Computer Science & Engineering at the University of Washington*

**WASHINGTON STEM**



Washington STEM is a nonprofit venture fund for innovation, equity, and excellence in STEM education.

## INVESTMENTS & REACH TO DATE

- **\$2.6** Million Investments
- **300** Teachers
- **11,000** Students
- *Across Washington*

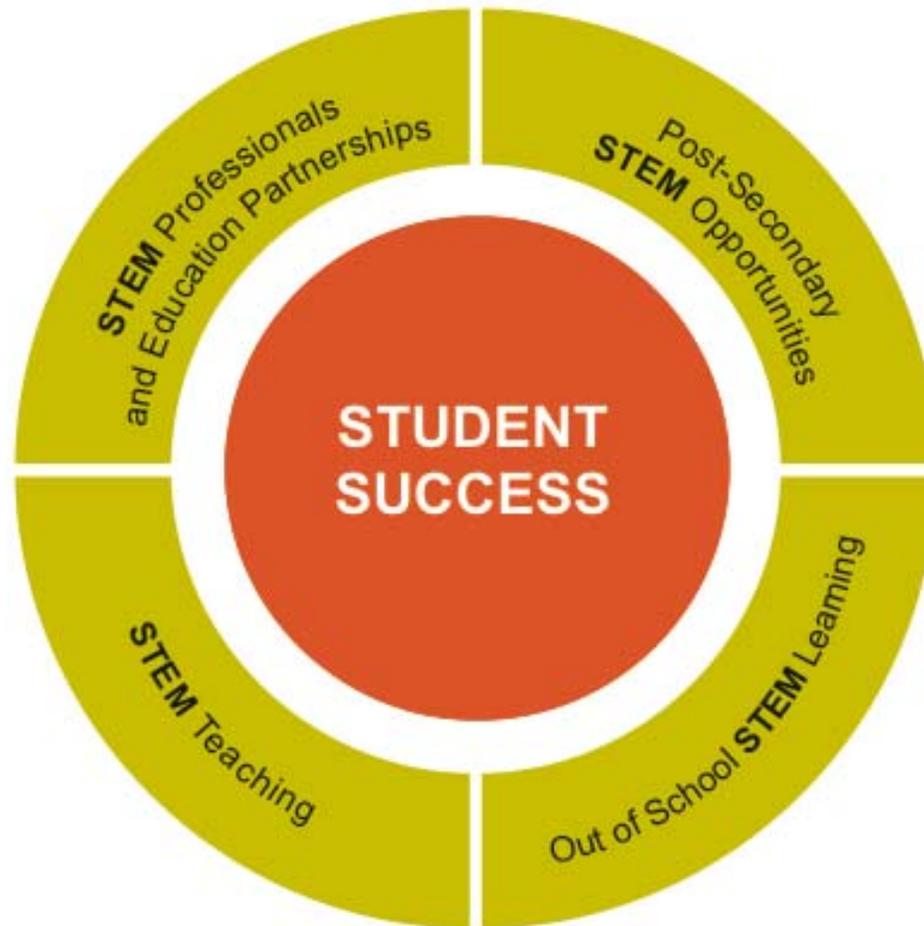


## STUDENT SUCCESS

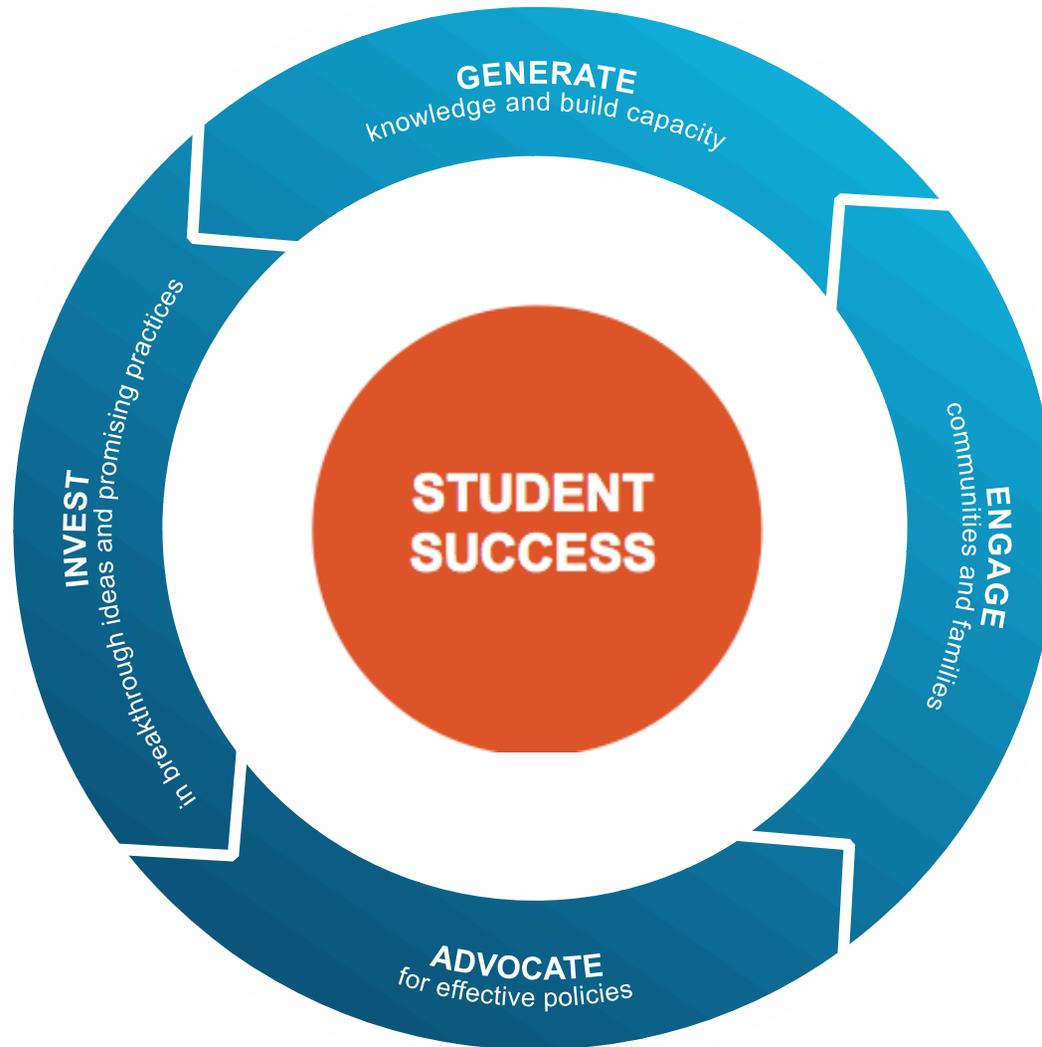
- STEM literacy
- Post-secondary education or training in STEM
- Entry into STEM workforce



# FOUR LEVERS FOR CHANGE



# FOUR STRATEGIES



**STEM IN ACTION**

## MESA

*Preparing underserved students to succeed*



## ESD 112

### *Supporting Washington's transition to Common Core*

#### **Heidi Rhodes**

Secondary Math Specialist  
Evergreen Public Schools

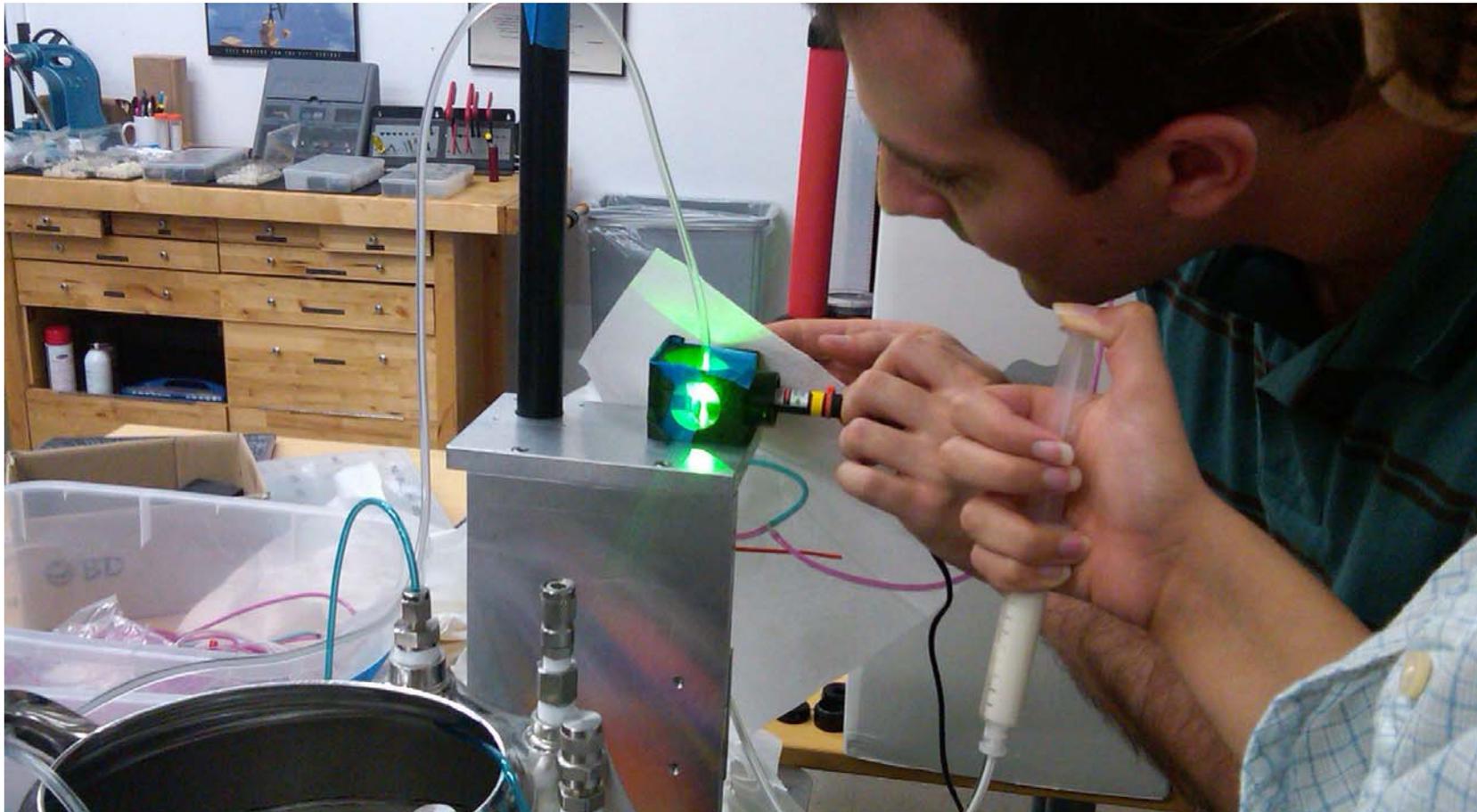


#### **ESD 112 - \$10,000 Entrepreneur Award**

- 30 school districts & 23 private schools in Southwest Washington
- 43% Poverty
- 28% Minority
- *Reaching over 2,000 students*

## CLEVELAND HIGH SCHOOL

*Connecting students with real world experiences  
and STEM careers*



# NEXT GENERATION SCIENCE STANDARDS

*Partnering with the state to lead the nation*



CURRENT PHASE

Standards development is underway!

Learn more about the standards development process

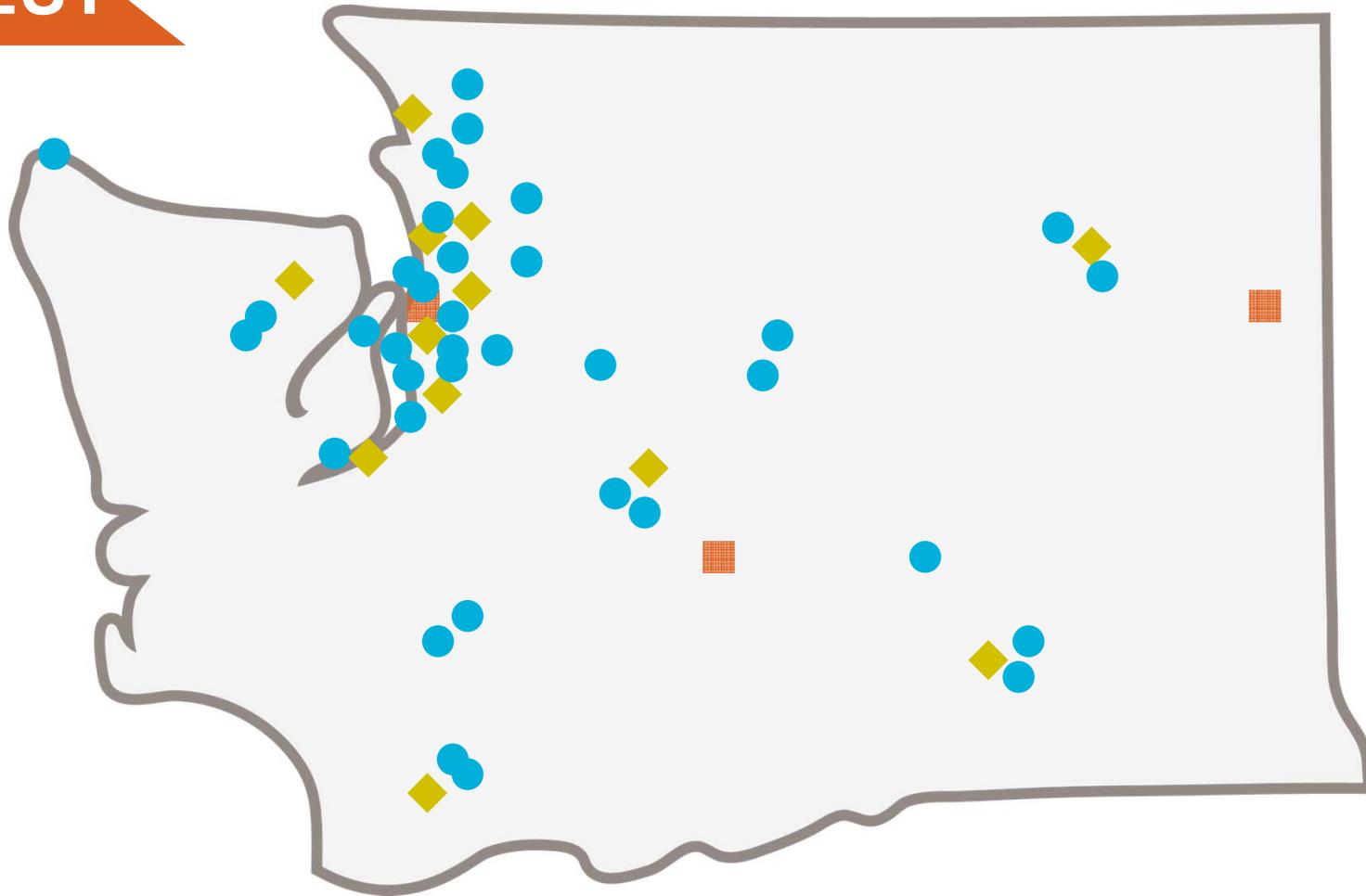
*Roll over the arrows to the right to see upcoming development phases*

1

2

3

INVEST

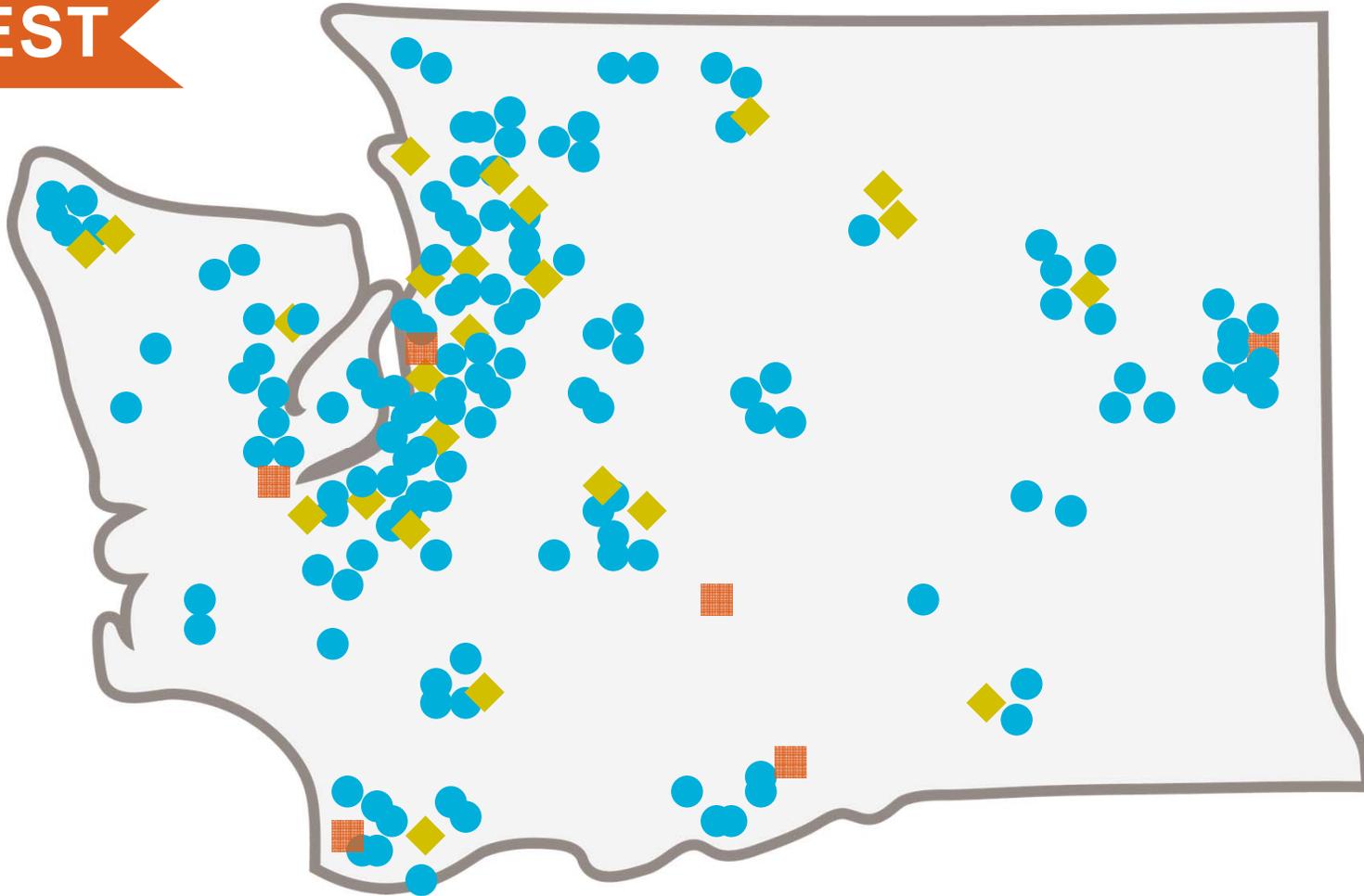


● Inaugural Entrepreneurial Awards

■ Emerging Learning Networks

◆ Portfolio Awards

INVEST

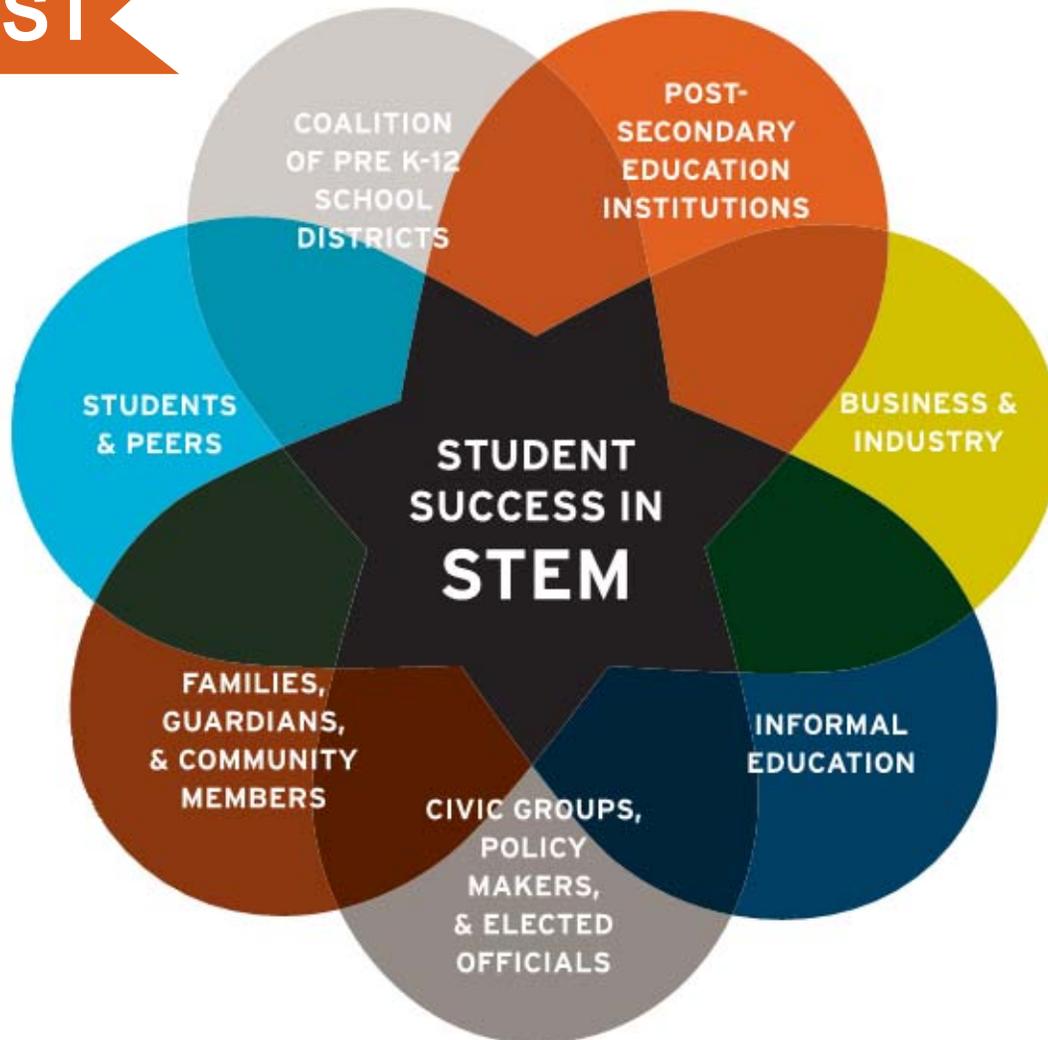


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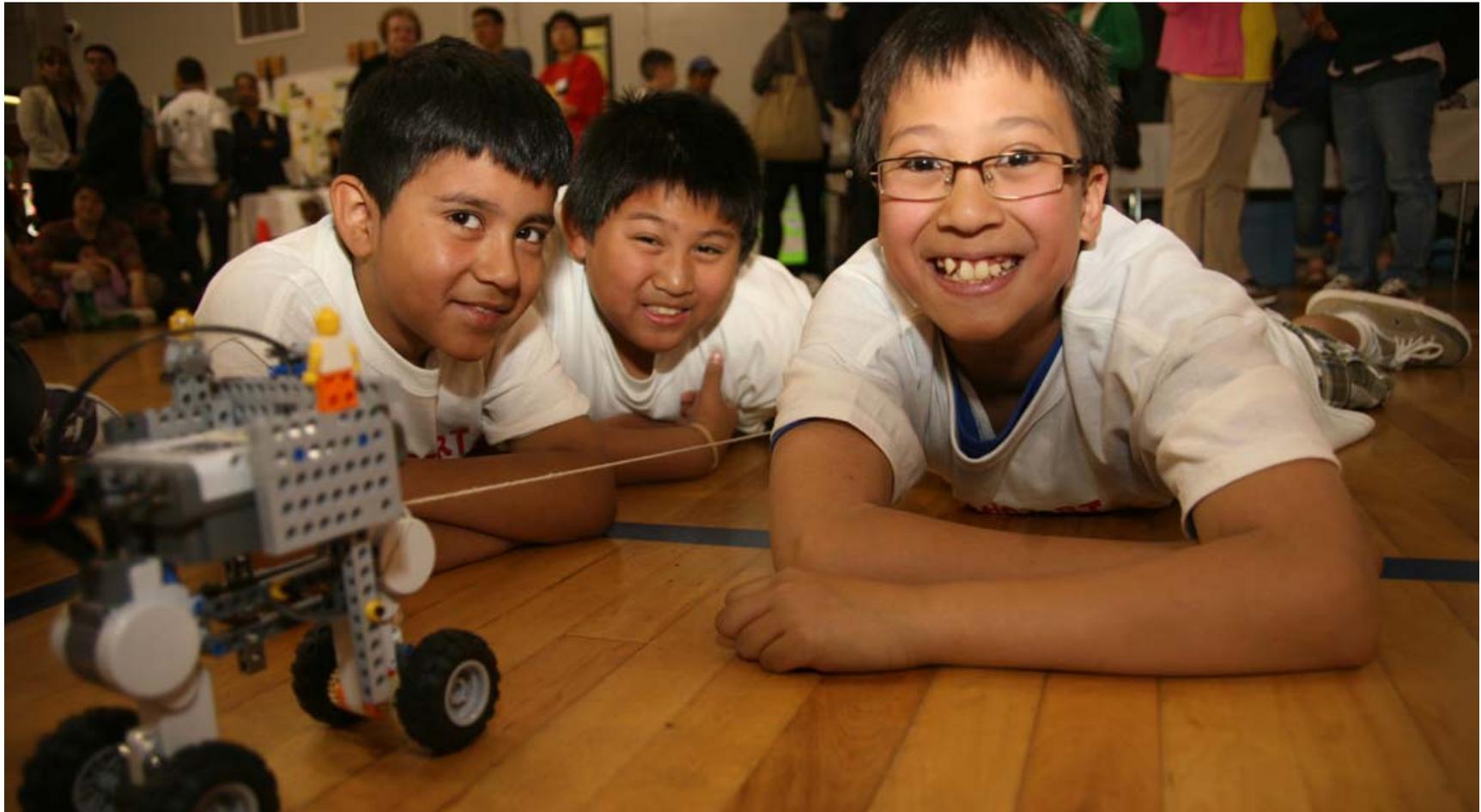
INVEST



## Learning Networks

- Place-based investment for community-driven plan
- Engages schools, nonprofits, businesses, and others to drive innovation

GENERATE > ENGAGE >  
ADVOCATE



21<sup>st</sup> century

STEM

education

ONWARD!

## Julia Novy-Hildesley

Chief Executive Officer

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[www.washingtonstem.org](http://www.washingtonstem.org)

Join Washington STEM on  
**Facebook** and follow the  
work on our **blog!**





WASHINGTON  
**STEM**  
ADVANCING SCIENCE, TECHNOLOGY,  
ENGINEERING AND MATH EDUCATION





Julia Novy-Hildesley  
Chief Executive Officer

**EDUCATION:**

Stanford University: Bachelor of Science in Human Biology, Minor in African Studies

Sussex University, Institute for Development Studies: Master of Philosophy in International Development

**HONORS:**

Named a Young Global Leader by the World Economic Forum in 2010

Fellow of the Donella Meadows Leadership Fellows Program

One of *Portland Business Journal's* 2008 "Forty leading business people under the age of 40"

Featured in *Oregon Business Magazine's* 2005 "50 Great Leaders for Oregon"

Julia Novy-Hildesley is the Chief Executive Officer of Washington STEM. With an inspiring board and staff team, she drives the strategic vision of the organization, devoted to creating young people prepared for work, life and citizenship in the 21<sup>st</sup> century.

Julia's past and current work is unified by a theme of forging multi-stakeholder partnerships to test new models and extend proven approaches to unleashing innovation. She is the former executive director of the Lemelson Foundation, a private philanthropy dedicated to catalyzing invention and innovation through educational and investment strategies. During her tenure, the foundation expanded its focus on STEM education among underserved communities in the United States, launched an international program, doubled its annual grantmaking, and initiated creative investment strategies.

Prior to the Lemelson Foundation, Julia served as director of the World Wildlife Fund's Pacific office where she spearheaded the organization's public outreach on the West Coast. She also lectured at Stanford University's Law School, and in the earth sciences, anthropological sciences, and human biology departments.

Julia was named a Young Global Leader by the World Economic Forum in 2010. That year, she served as a topic leader for the Clinton Global Initiative (CGI) annual meeting, designing the "Market-based Solutions" track. She is also fellow of the Donella Meadows Leadership Fellows Program, and was selected as one of *Portland Business Journal's* 2008 "Forty leading business people under the age of 40," as well as *Oregon Business Magazine's* 2005 "50 Great Leaders for Oregon."

Julia has lived and conducted research in Madagascar, Tanzania, Bolivia, French Polynesia, and other developing countries. She has consulted for a range of governmental organizations, including the World Bank, United States Agency for International Development (USAID), and the U.K. Department for International Development, as well as non-governmental organizations and private sector partners.

She has served on several boards, including the editorial board of Massachusetts Institute of Technology's *Innovations Journal*, Harvard University's Women's Leadership board, and Portland State University's Engineering and Technology Management Board. Her writing has been published in *Innovations Journal*, the *Journal of Ethnopharmacology*, *GOOD* magazine, *Sustainable Business Oregon*, and *Far Eastern Economic Review*.

A Fulbright and Marshall scholar, Julia pursued her undergraduate degree at Stanford University and her master's at Sussex University, where she studied international development. Julia speaks French, Spanish, and Kiswahili.

**ABOUT WASHINGTON STEM**

Washington STEM is a nonprofit organization that aims to advance innovation, equity, and excellence in science, technology, engineering and mathematics (STEM) education in Washington State.