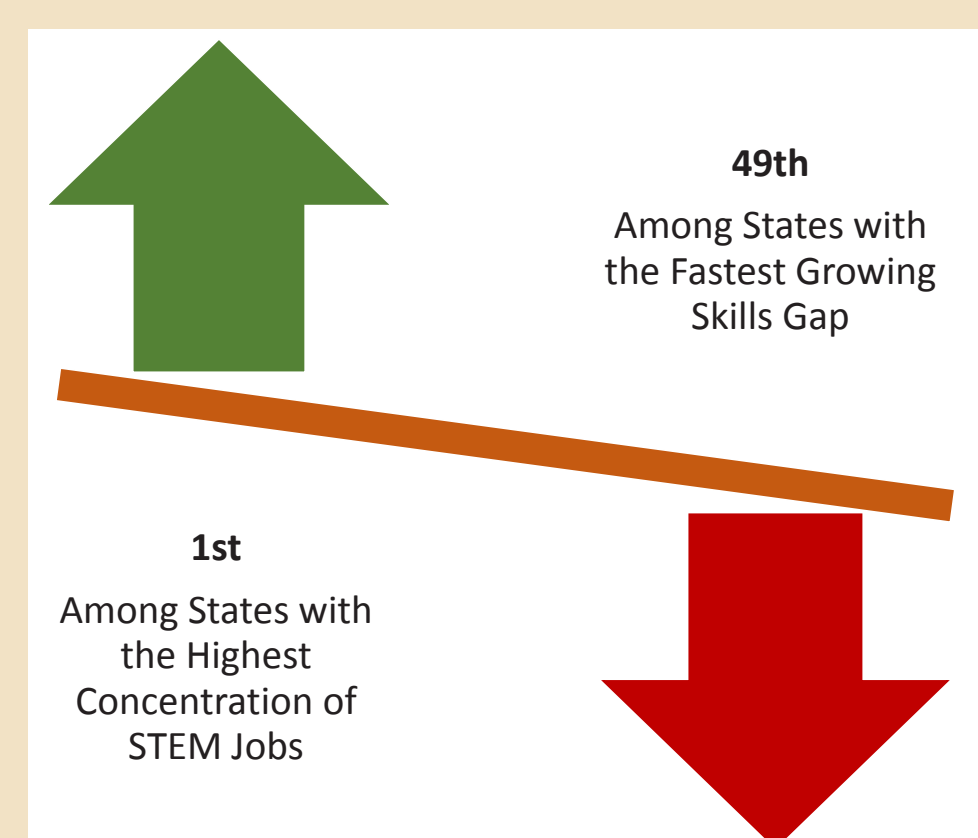




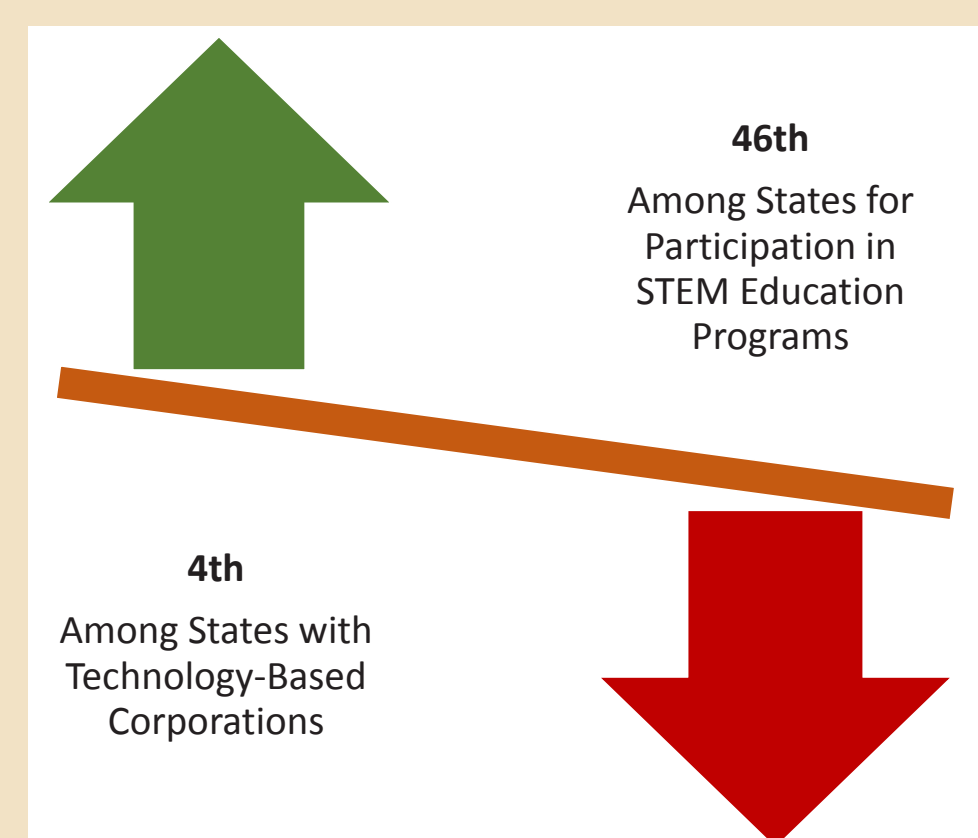
THE CHALLENGE

FOSTERING SYNERGY BETWEEN WASHINGTON'S EDUCATION SYSTEM AND ITS TECHNOLOGY-DRIVEN ECONOMY.

Aligning the education system with employers' needs in Washington requires a direct focus on STEM education.

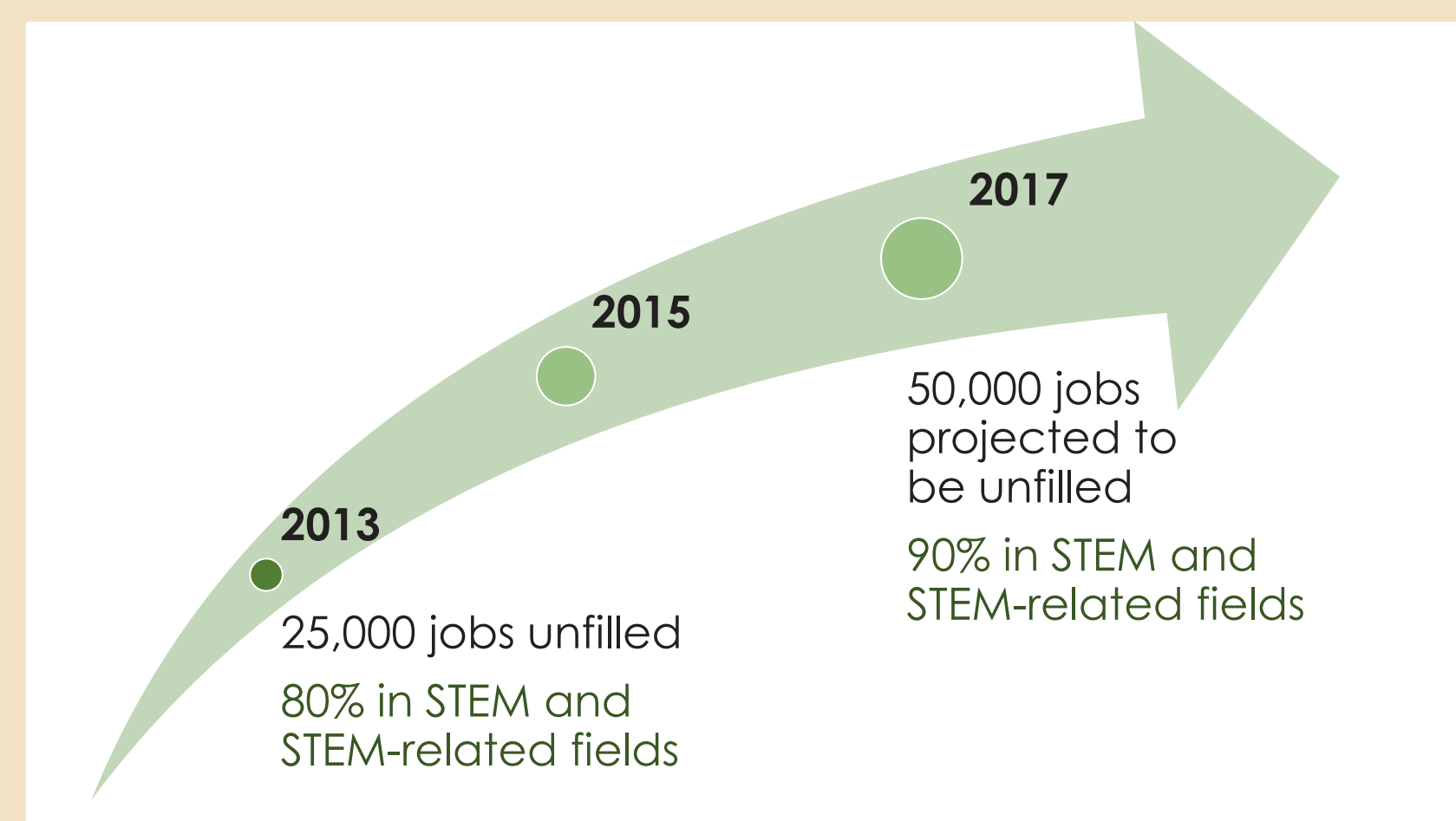


Washington's growing high-tech economy creates high-skilled, high-wage jobs, putting pressure on the state's postsecondary education and training system to keep pace with employer demand.



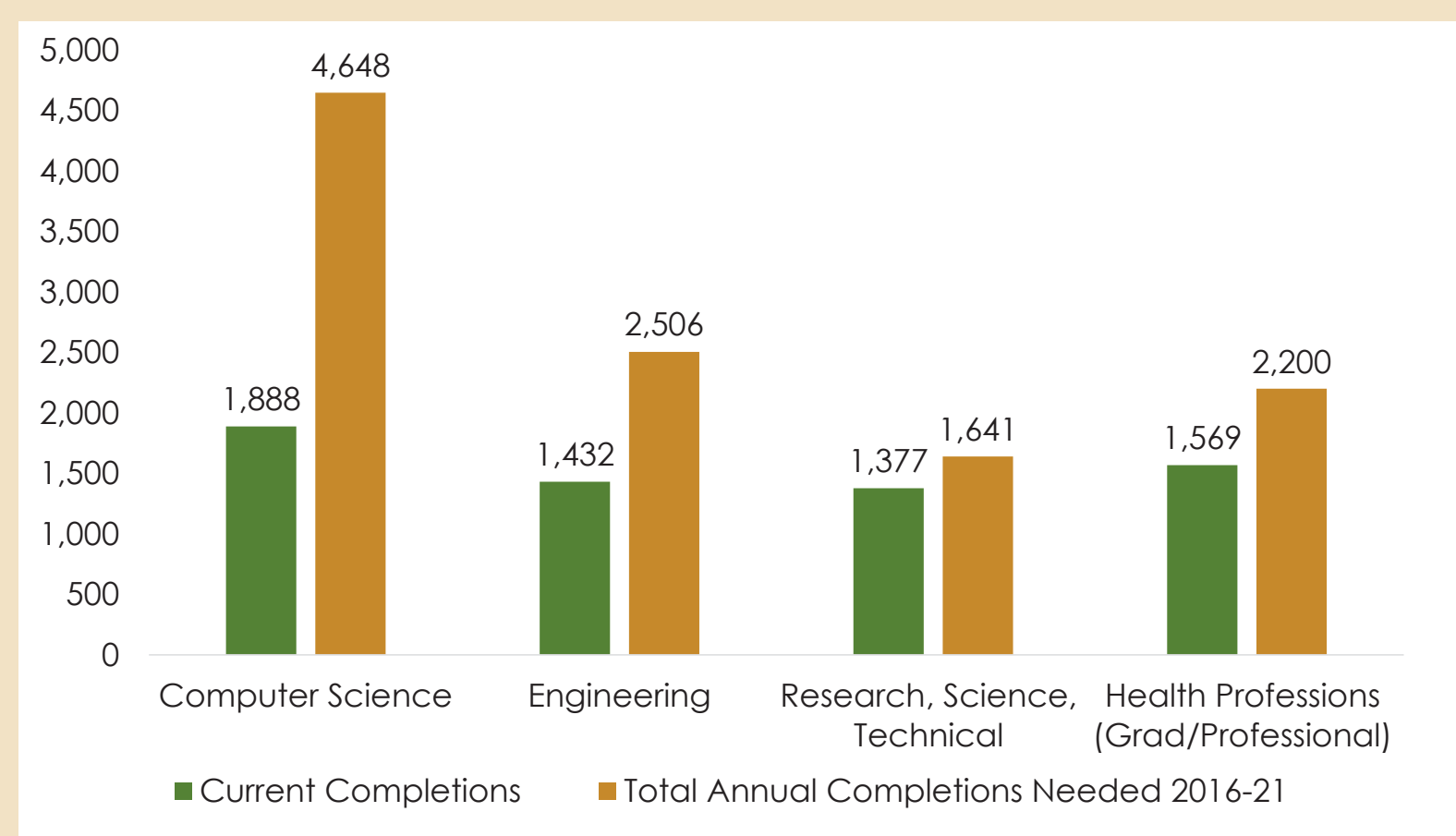
Washington's employers are experiencing a growing number of unfilled vacancies due to a lack of qualified candidates.

Unfilled Vacancies Due to a Lack of Qualified Candidates



Demand for workers in STEM occupations is increasing at every education level.

High Employer Demand Fields at Baccalaureate Level and Above (2013)



STEM supply problem goes beyond the need for more professional scientists, engineers, computer scientists, and mathematicians.

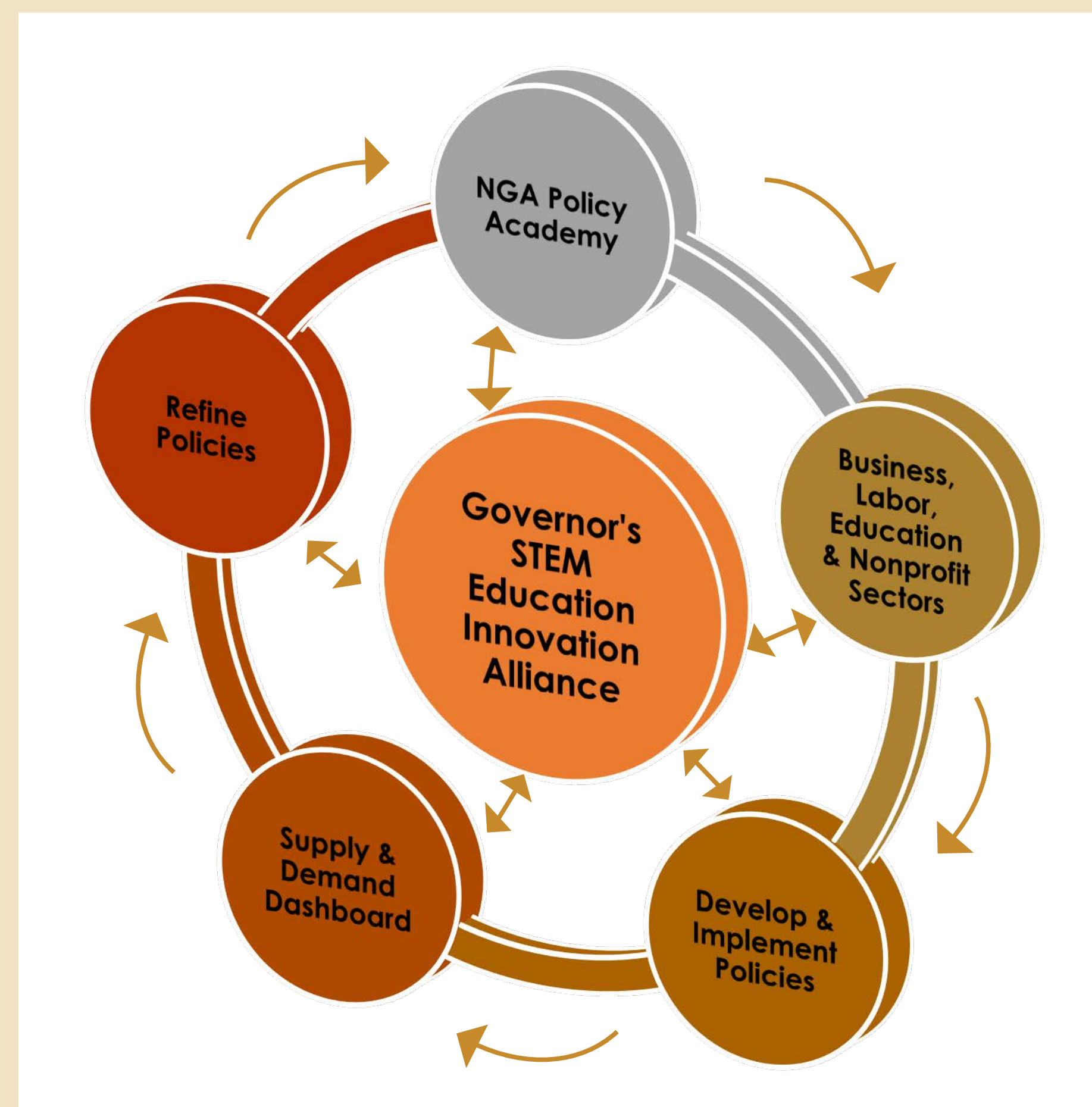
There is also a need for more qualified technicians and skilled STEM workers in a range of occupations and training levels.



WASHINGTON STATE



PRIMARY STRATEGY DRIVING THE ACTION PLAN



THE GOVERNOR'S STEM EDUCATION INNOVATION ALLIANCE:

- Leverages resources of the NGA Policy Academy to identify best practices.
- Collaborates with key partners from the education, business, labor, and nonprofit sectors.
- Advises the Governor in the development and implementation of policies to advance STEM education.
- Tracks progress through the creation of a dashboard.
- Refines policies based on the results in an iterative process.

ABOUT THE ALLIANCE

- Proposed by Governor Jay Inslee and approved by the Washington State Legislature in 2013 in House Bill 1872.
- Includes members from business, labor, nonprofit, and education organizations.
- Advises the Governor on policies designed to advance STEM education for a diverse population and prepares graduates for employment opportunities in Washington's technology-driven economy.
- Endeavors to ensure that graduates are STEM literate, which is defined as having the ability to identify, apply, and integrate concepts from science, technology, engineering, and mathematics to understand complex problems and innovate to solve them.
- Ensures that creativity, the arts, and other essential elements of a liberal education are integrated with STEM curricula.
- Collaborates with the NGA Policy Academy, which will play a key role in advancing the STEM Alliance agenda, catalyzing efforts to bring disparate resources together and promoting best practice strategies.



FORGING KEY PARTNERSHIPS

The STEM Education Innovation Alliance will work with key partners.

- **Regional STEM networks** in South King County (Puget Sound), Spokane, Tri-Cities, Vancouver, Yakima Valley, and Snohomish County will help build education and training systems aligned with the needs of local and state economies.
- **Washington STEM** will help forge strong relationships with crucial partners in this endeavor and coordinate annual statewide summits, convening a broad range of interested education, business, and community leaders, as well as policymakers and philanthropists.
- Established organizations focused on STEM issues like Washington **Mathematics Engineering Science Achievement (MESA)** and **Leadership & Assistance for Science Education Reform (LASER)** will form a solid foundation on which policy activity can build.

TRACKING PROGRESS

- A **talent supply and demand dashboard** will provide a valuable mechanism for tracking progress, sharing data, and focusing strategic attention on areas of the education pipeline that could be most productively improved.
- Jim Schmidt, Director of the Education Research Data Center, will lead the effort to create this essential strategic tool.

METRICS

DASHBOARD FRAMEWORK

Broad Goals	Metrics
Goal 1: Increase the number and diversity of STEM literate students in the education-to-career pipeline.	Indicator 1: Student interest in STEM fields. Indicator 2: Student STEM achievement in PreK-12 system. Indicator 3: Student readiness for college-level study in STEM fields. Indicator 4: Enrollment in postsecondary STEM programs. Indicator 5: Increase project-based, career, workplace, and community learning opportunities that provide STEM and 21st century skills. Indicator 6: Increase supplemental STEM-enriching learning opportunities both inside and outside the classroom.
Goal 2: Increase the diversity and capacity of K-12 teachers and schools to deliver high-quality, effective STEM education to diverse populations.	Indicator 7: K-12 STEM classes taught by educators trained in the discipline. Indicator 8: Teachers and school leaders with STEM-related degrees.
Goal 3: Expand capacity and pathway options for postsecondary and adult training programs to increase the number and diversity of STEM literate adults.	Indicator 9: Graduates from postsecondary institutions with degrees in STEM fields. Indicator 10: Increase number of graduates in academic transfer STEM programs in public community and technical colleges. Indicator 11: Increase the number of students earning credentials in high employer demand professional technical programs in public community and technical colleges. Indicator 12: Alignment of STEM education programs with workforce needs in key economic sectors. Indicator 13: Narrowing or closing of STEM employment skill gaps.
Goal 4: Increase both public and private support to advance STEM education and workforce alignment goals.	Indicator 14: Funding/resource allocation for STEM education and career training programs in Washington State.



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STATE ACTION PLAN

Vision

- Washington faces the challenge of aligning its education and career training system with a rapidly growing and dynamic technology-driven economy.
- The Governor is committed to a focus on STEM education to promote the health of the economy and to boost student prospects for seizing the high-skill, high-wage opportunities our thriving innovation economy offers.

Data

- Washington has a number of ongoing data projects it can leverage to integrate and track education and workforce data to inform policy, monitor progress, and measure success.
- In addition, a new dashboard will be created that is dedicated to tracking progress on a range of specific metrics closely related to the objectives in Washington's Action Plan.

Partnerships

- **Partnerships with Washington STEM and Regional STEM networks** will help build education and training systems aligned with the needs of local and state economies and strong relationships with crucial partners. Annual statewide summits will be convened with a broad range of education, business, and community leaders, as well as policymakers and philanthropists.
- Established organizations focused on STEM, like **Washington Mathematics Engineering Science Achievement (MESA)** and **Leadership & Assistance for Science Education Reform (LASER)**, will form a solid foundation on which policy activity can build.

Resources & Incentives

- An asset map of state and federal funding and programs intended for improving education, workforce training, or economic development will be developed.
- We will explore options to expand existing performance funding mechanisms to increase the effectiveness and efficiency of the state's postsecondary, workforce and career tech systems.

LEADING CHALLENGES AND SUCCESSES

Top policy or action item that we hope to learn more about from other states?

- How other states with technology-based economies are addressing the challenges of aligning their education systems with employment opportunities.
- Best practice insights in the development and uses of a talent demand and supply dashboard.

Critical work we are completing now that we can share with other states?

- **Results Washington**, a web-based, data-driven performance management and continuous improvement system (<http://www.results.wa.gov/>).
- **Governor's STEM Education Innovation Alliance**, a committee appointed by Governor Inslee with members from business, labor, nonprofit, and education organizations to advise and guide statewide STEM education initiatives (<http://www.governor.wa.gov/news/releases/article.aspx?id=323>).
- **Washington STEM Framework for Action and Accountability**, an outline of measurable goals and indicators to track progress in improving STEM education and workforce outcomes (<http://www.washingtonstem.org/>).
- Early implementation of **Common Core State Standards (CCSS)** and **Next Generation Science Standards (NGSS)**.
- **Washington Education Research Data Center (ERDC) data tracking efforts:** (1) longitudinal P20-through-workforce data tracking and (2) annual STEM Benchmark Report Cards, using key metrics associated with the Washington STEM Framework for Action and Accountability (<http://www.erd.wa.gov/>).

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Washington NGA-STEM Project 2014 -16

Dashboard Framework

K-12 STEM Readiness	Postsecondary STEM Achievement	Workforce STEM Careers
GOAL 1: Increase the number of K-12 students who graduate prepared for postsecondary STEM studies	GOAL 2: Increase the number of students who graduate prepared for STEM careers	GOAL 3: Improve alignment of STEM education programs with STEM & STEM-related workforce needs and employment opportunities
1. Student achievement in STEM courses in the K-12 system	3. Enrollment in postsecondary STEM programs	5. Narrowing or closing of STEM skill gaps in high employer demand fields
1a. Number of Math courses completed	3a. Enrollment in Computer Science and Information Technology programs	5a. Skills gap in Computer Science and Information Technology
1b. Number of Science courses completed	3b. Enrollment in Science and Mathematics programs	5b. Skills gap in Science and Mathematics
1c. K-12 STEM classes taught by educators trained in the discipline	3c. Enrollment in Engineering and Related Technology programs	5c. Skills gap in Engineering and Related Technology fields
1d. Teachers/School leaders with STEM-related degrees	3d. Enrollment in Health programs	5d. Skills gap in Health fields
2. Student preparedness for college-level study in STEM fields	4. Number of graduates in postsecondary STEM degree or certificate programs	
2a. Percentage of students completing 3 or more Math courses	4a. Number of graduates from post-secondary institutions with degrees in STEM fields	
2b. Percentage of students completing 2 or more Science courses	4b. Number of graduates in STEM academic transfer programs in public community and technical colleges	
2c. Percentage of students passing tests in STEM subjects	4c. Number of students earning credentials in high employer demand professional technical programs in public community and technical colleges	

K-12 STEM Readiness	Postsecondary STEM Achievement	Workforce STEM Careers
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2d. Number of dual-credit STEM courses completed		
2e. Student interest in STEM fields		
2f. Supplemental STEM-enriching learning opportunities both inside and outside the classroom		
2g. Project-based, career, workplace, and community learning opportunities that provide STEM and 21st century skills		

METRICS

Dashboard Framework

Broad Goals	Metrics
<p>Goal 1: Increase the number and diversity of STEM literate students in the education to career pipeline.</p>	Indicator 1: Student interest in STEM fields
	Indicator 2: Student STEM achievement in PreK-12 system
	Indicator 3: Student readiness for college-level study in STEM fields
	Indicator 4: Enrollment in postsecondary STEM programs
	Indicator 5: Increase project-based, career, workplace, and community learning opportunities that provide STEM and 21st century skills
	Indicator 6: Increase supplemental STEM-enriching learning opportunities both inside and outside the classroom
<p>Goal 2: Increase the diversity and capacity of K-12 teachers and schools to deliver high-quality, effective STEM education to diverse populations</p>	Indicator 7: K-12 STEM classes taught by educators trained in the discipline
	Indicator 8: Teachers/School leaders with STEM-related degrees
<p>Goal 3: Expand capacity and pathway options for postsecondary and adult training programs to increase the number and diversity of STEM literate adults</p>	Indicator 9: Graduates from post-secondary institutions with degrees in STEM fields
	Indicator 10: Increase number of graduates in academic transfer STEM programs in public community and technical colleges
	Indicator 11: Increase the number of students earning credentials in high employer demand professional technical programs in public community and technical colleges
	Indicator 12: Alignment of STEM education programs with workforce needs in key economic sectors
	Indicator 13: Narrowing or closing of STEM employment skill gaps
<p>Goal 4: Increase both public and private support to advance STEM education and workforce alignment goals</p>	Indicator 14: Funding/resource allocation for STEM education and career training programs in Washington State



Washington State

Using Data to Guide Education and Workforce Policy

Gene Sharratt

Executive Director, Washington Student Achievement Council

[1]

Washington's Data-Driven Culture

**Reliable data is essential for
informed policymaking**




**Washington has embraced this
need for data**

- **The Governor's Results
Washington Initiative**
- **The Roadmap (Washington
Student Achievement Council)**
- **Education Research Data Center
/ State Longitudinal Data System**
- **Skilled and Educated Workforce
Reports**




Results Washington

Governor Jay Inslee
A New Strategic Framework


Vision	A Working Washington built on education and innovation ... where all Washingtonians thrive.
Mission	<ul style="list-style-type: none">➢ Foster the spirit of continuous improvement➢ Enhance the conditions for job creation➢ Prepare students for the future➢ Value our environment, our health and our people
Foundation	<ul style="list-style-type: none">➢ Create a responsive, innovative and data driven culture of continuous improvement.➢ Recognize Washington's rich natural resources, diverse people and entrepreneurial drive, and build upon our legacy.➢ Operate state government with the expectation that success is dependent on the success of all.➢ Create effective communication and transparency on goals, measures and progress in meeting expectations.➢ Deepen our focus, understanding and commitment to our citizens: Know our customers.
Goals	<div style="display: flex; justify-content: space-around; align-items: center;"><div style="text-align: center;"> World-Class Education</div><div style="text-align: center;"> Prosperous Economy</div><div style="text-align: center;"> Sustainable Energy and a Clean Environment</div><div style="text-align: center;"> Healthy and Safe Communities</div><div style="text-align: center;"> Efficient, Effective and Accountable Government</div></div>
Measure & Improve	<p>Building a more responsive, data-driven state government to get results:</p> <div style="text-align: center;"> www.results.wa.gov</div>

3



2023 Educational Attainment Goals

- All adults in Washington, ages 25-44, will have a high school diploma or equivalent (Currently at 89%).
- At least 70 percent of Washington adults, ages 25-44, will have a postsecondary credential (Currently at 50%).



New metrics to be integrated with broader dashboard development.

For more information: <http://www.wsac.wa.gov/the-roadmap>

4

Annual assessment of progress using the following metrics:

- Number and percentage of adults completing a high school diploma or equivalent.
- Percentage of adults enrolled in a postsecondary certificate, apprenticeship, or degree program.
- Number of postsecondary certificates, apprenticeships, and degrees awarded annually.



The Roadmap calls for the creation of a website to provide ongoing, real-time data updates.

- Progress measures will be identified and refined to reflect specific Roadmap goals.
- May be integrated with broader dashboard development projects in the state.

Two Ongoing Data Projects

Washington's P-20 STATE LONGITUDINAL DATA SYSTEM (SLDS) Project

P-20 longitudinal data system, from early learning
through workforce participation.



A Skilled and Educated Workforce Report

Identifies skill gaps by comparing:

- **Current supply (rate of degree production)**
- **Projected annual employer demand**

5

SLDS PROJECT


- A collaborative effort by the Office of Superintendent of Public Instruction, the Education Research and Data Center, and other partner agencies.
- Washington was awarded 17.3 million dollars in grant funding by the Institute of Education Sciences (2009).
- Built upon Washington's statewide K-12 longitudinal data system which tracks individual student enrollment, assessments, and course-taking information, as well as information about teachers.
- Extended those K-12 capabilities by incorporating longitudinal early learning, post-secondary, and workforce information, toward the formation of a comprehensive P-20 data system.

A Skilled and Educated Workforce Reports

- Biannual reports assessing the number and type of higher education and training credentials required to match employer demand for a skilled and educated workforce.
- Prepared by the Washington Student Achievement Council, in collaboration with the Workforce Training & Education Coordinating Board and the State Board for Community and Technical Colleges.
- **Workforce education analysis:**
 - Compares current supply (rate of degree production) with projected annual demand by education level, based on long-term employment projections from Employment Security Department).
 - Identifies skill gaps and high employer demand fields

Key Factors in the Effective Use of Data:

- Carefully selected progress indicators
- Well-managed data governance
- Efficient methodology



6

Carefully selected progress indicators:

- Indicators must be capable of measuring what they are intended to
- They should not be redundant, leading to wasted time and effort (this can burden and strain relationships with partner agencies)
- Indicators should be considered carefully to ensure that there are available and reliable data sources for them.

Well-managed data governance:

- Agreements outlining when, how, and what data can be shared are a crucial component to making data available and facilitating the sharing of linked individual-level data while also protecting individuals' privacy.

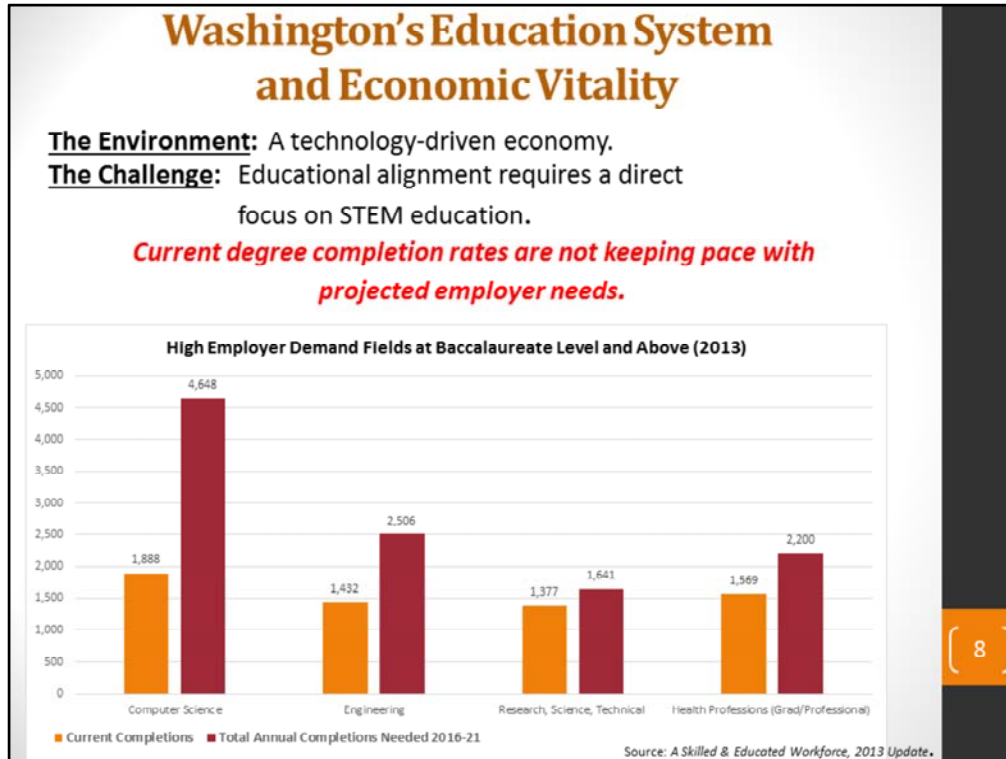
The Washington Imperative

What's Next for Washington?



A focus on **STEM** to align the education and career training system with a technology-driven economy.

[7]



- Washington currently ranks #1 nationally in the concentration of STEM jobs.
- Washington's growing high-tech economy creates high-skilled, high wage jobs putting pressure on the state's postsecondary education and training system to keep pace with employer demand.
- Washington ranks fourth in the country for technology-based corporations but only 46th for participation in STEM education programs.
- In 2013, there were 25,000 unfilled jobs in Washington due to a lack of qualified candidates.
- Eighty percent were in high-demand healthcare and STEM fields, such as computer science and engineering.
- By 2017, approximately 50,000 vacancies are expected.

- Ninety percent are projected from STEM and healthcare fields.

Integrating Workforce & Education Data

Governor's STEM Education Innovation Alliance:

- **Forms a multi-sector alliance.**
- **Brings together government, business, labor, and education groups to align the education system with state workforce needs.**
- **Leverages NGA Policy Academy resources to promote the use of best practices.**
- **Creates a talent supply and demand dashboard, complementing other ongoing Washington data projects.**

9

In 2013, key legislation was passed establishing a multi-sector **STEM Education Innovation Alliance** (E2SHB 1872) by Governor Inslee—to bring government, business and education sectors together to match the education system with the state's workforce needs.

Leverages NGA Policy Academy resources to promote the use of best practices

NGA Policy Academy Grant program will leverage the Governor's STEM Education Innovation Alliance initiative to:

Bring disparate resources together.

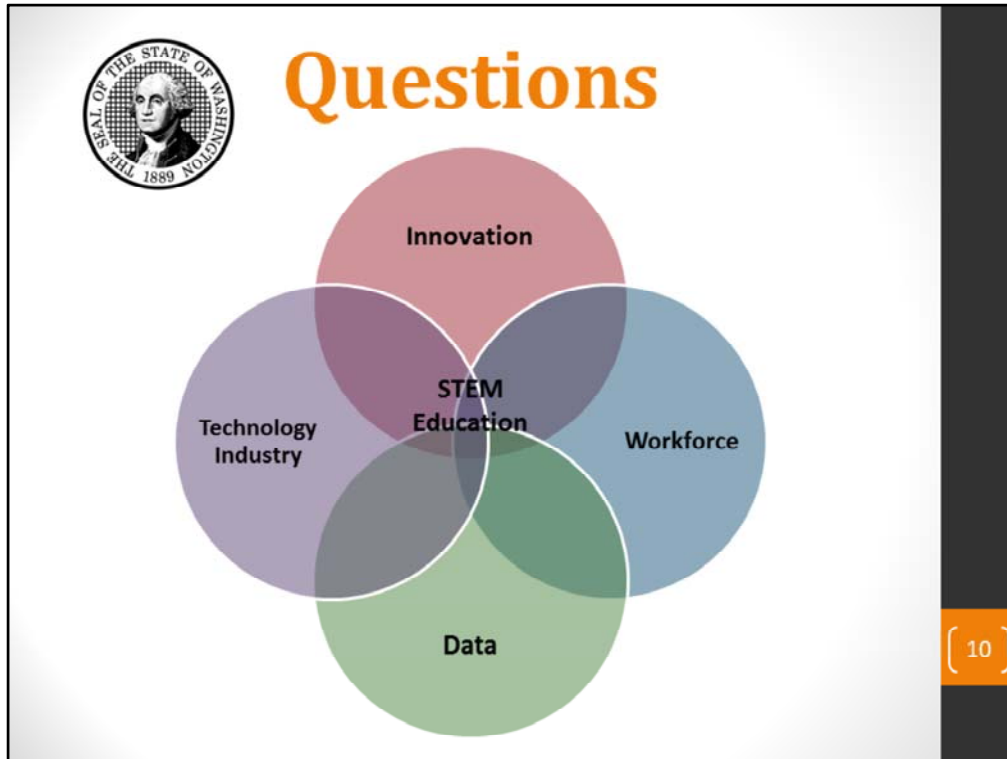
Promote best practice strategies through the cross-state partnerships.

Builds upon the Governor's Results Washington Initiative and other workforce education resources.

Create a talent supply and demand dashboard.

- Led by Jim Schmidt, Director, Education Research Data Center (ERDC)
- In collaboration with agency partners

Leverage the ERDC's ongoing project to track and connect longitudinal data on individuals and cohorts as they move through P-20 education and subsequent training programs into jobs.



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Phone: 360-753-7863
Email: darylm@wsac.wa.gov



Governor Inslee's STEM Education Innovation Alliance

Name	Position	Organization
Brian Bonlender	<i>Director</i>	Washington State Department of Commerce
Violet "Vi" Boyer	<i>President and CEO</i>	Independent Colleges of Washington
Jeff Charbonneau	<i>2013 National Teacher of the Year</i>	Zillah High School and Educational Service District 105
Maud Daudon	<i>Director & CEO</i>	Seattle Metropolitan Chamber of Commerce
Susan Enfield	<i>Superintendent</i>	Highline School District
Christine Johnson	<i>Chancellor</i>	Spokane Community Colleges
Scott Keeney	<i>President & CEO</i>	nLIGHT Corporation
Caroline King	<i>Chief Policy Officer</i>	Washington STEM
Mike Kluse	<i>Director</i>	Pacific Northwest National Laboratory
Ed Lazowska	<i>Bill & Melinda Gates Chair</i>	University of Washington Computer Science & Engineering
Marcie Maxwell	<i>Senior Policy Advisor on Education</i>	Governor Inslee's Legislative Affairs & Policy Office
Gil Mendoza	<i>Deputy Superintendent</i>	Office of Superintendent of Public Instruction
Isabel Munoz-Colon	<i>State Board of Education Member</i>	City of Seattle
Gene Sharratt	<i>Executive Director</i>	Washington Student Achievement Council
Brad Smith	<i>Executive Vice President</i>	Microsoft Corporation
Stan Sorscher	<i>Labor Representative</i>	Society of Professional Engineering Employees in Aerospace
Brian Teppner	<i>Principal, Newport Heights Elementary School</i>	Bellevue School District
Nancy Truitt Pierce	<i>Director, School Board</i>	Monroe Public Schools
Margaret Tudor	<i>Executive Director</i>	Pacific Education Institute
Joyce Walters	<i>CEO and Founder</i>	Corporate Education Strategies
Yolanda Watson Spiva	<i>President & CEO</i>	College Success Foundation
Sam Whiting	<i>President & CEO</i>	Thrive By Five Washington
Yale Wong	<i>Chairman and Founder</i>	General Biodiesel

State of Washington House Bill 1872 created the STEM Education Innovation Alliance; enacted into law in 2013.



Governor Jay Inslee

A New Strategic Framework

Vision

A **Working Washington** built on education and innovation ... where all Washingtonians thrive.

Mission

- Foster the spirit of **continuous improvement**
- Enhance the conditions for **job creation**
- Prepare **students** for the future
- Value our **environment**, our **health** and our **people**

Foundation

- **Create** a responsive, **innovative** and data driven culture of continuous improvement.
- **Recognize** Washington's rich **natural resources**, diverse **people** and entrepreneurial **drive**, and build upon our legacy.
- **Operate** state government with the expectation that success is dependent on the success of **all**.
- **Create** effective communication and transparency on **goals**, **measures** and **progress** in meeting expectations.
- **Deepen** our focus, understanding and commitment to our citizens: **Know our customers**.

Goals



World-Class Education



Prosperous Economy



Sustainable Energy and a Clean Environment



Healthy and Safe Communities



Efficient, Effective and Accountable Government

Building a more responsive, data-driven state government to get results:

Measure & Improve



www.results.wa.gov