

# INNOVATING OREGON'S FUTURE

**A Targeted STEM Strategic Plan**

December 2015



# STEM Investment Council

Created to assist the Chief Education Officer with the development and implementation of a long-term strategy to advance the state's STEM goals.

**By 2025:**

- Double the number of students proficient or advanced in math and science.
- Double the number of STEM degrees and credentials.

# STEM Investment Council Vision

To build an inclusive, sustainable, innovation-based economy...by empowering individuals... [with] skills and mindsets necessary to:

- Fully contribute to an increasingly complex and technologically rich global society
- Address high-demand workforce and industry needs
- Improve the prosperity of all individuals and communities across the state
- Become creative, life-long learners who can adapt to changing social and economic conditions

# Oregon Is on the Move

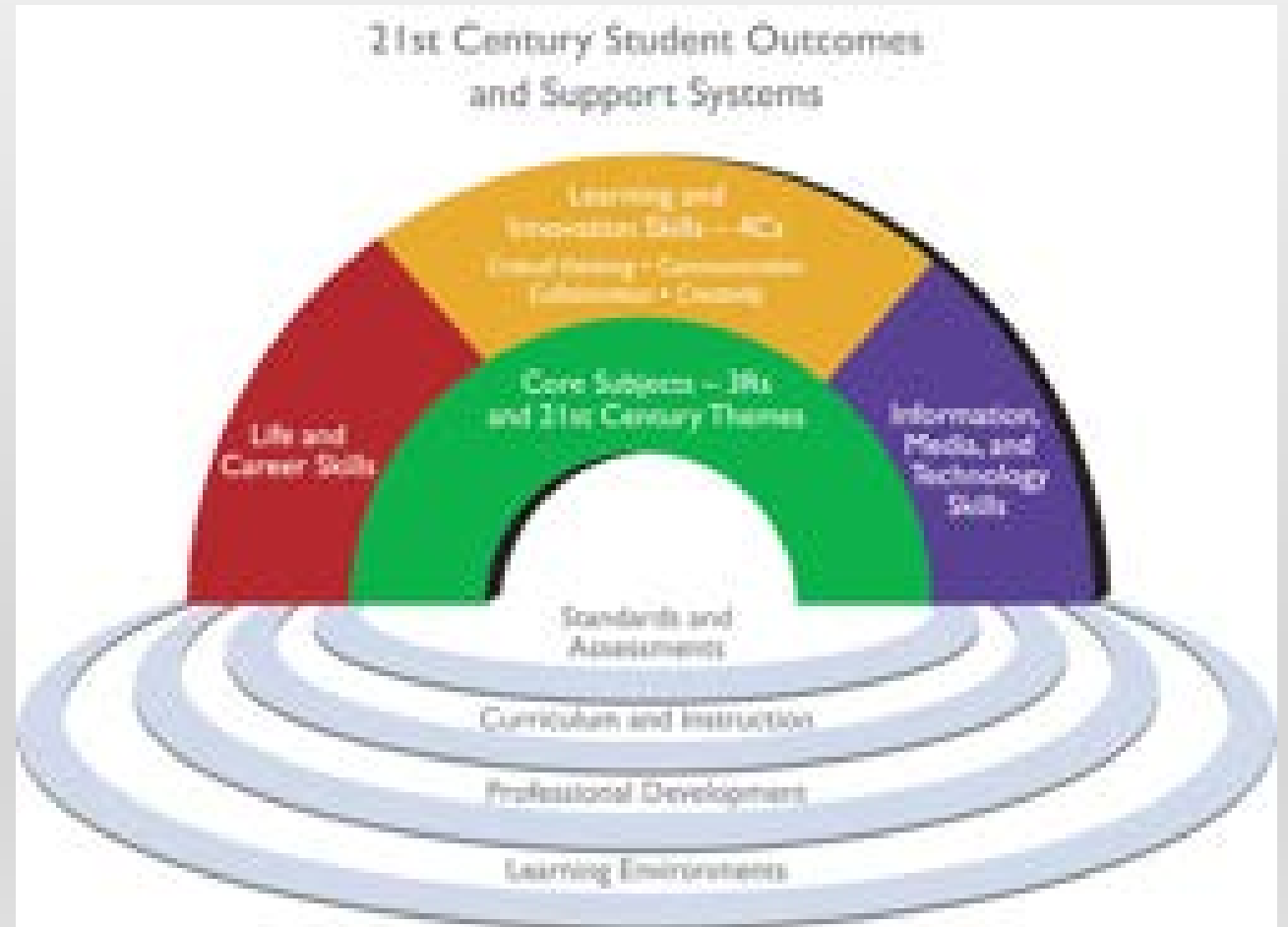
## Economic Growth

- 22,000 new jobs in 2013, driven by STEM
- Nation's 8<sup>th</sup> fastest growing economy
- By 2020, 40,000 new job openings in STEM per year
- Most in-demand industries: Healthcare, Manufacturing & Information Services

# Prosperity for all students

*What skills are necessary to succeed in tomorrow's world?*

- Creativity and Innovation
- Critical Thinking
- Problem Solving
- Communication
- Collaboration
- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility



# Oregon's Imminent Threat

4-year Graduation rate one of the lowest in the country.

Student performance is stuck in the middle

- 40<sup>th</sup> in nation on 4<sup>th</sup> grade math
- 25<sup>th</sup> in nation on 4<sup>th</sup> grade science
- 32<sup>nd</sup> in nation on 8<sup>th</sup> grade math
- 24<sup>th</sup> in nation on 8<sup>th</sup> grade science

Students of color and low-socioeconomic status significantly trail their peers.

- Averaging 18+ points lower on math benchmarks

# STEM Policy and Investment Gaps

**Conditions & Influencers:  
GAPS**

**Preparing & Developing STEM Educators**

- Elementary teachers and some secondary science teachers not required to pass content test
- State's elementary math teacher prep programs don't meet NCTQ standards – received a "D"
- Only 41% of Oregon's educators agree that PD is differentiated
- 41% of teachers in OR Coast STEM Hub lacked access to science PD; 52% to technology & engineering PD

**Time on Science**  
Oregon ranks 50<sup>th</sup> in instructional hours spent on science, averaging 1.9 hrs/wk

**Educator Diversity**  
36% students of color in K-12, but only 8.5% educators of color

**Computer Science**  
Only 13 schools offered AP Computer Science in 2013-14

- Only 15% high schools offered Computer Science in 2012

**STEM Credentials Awarded in 2013\*\***  
852 Certificates;  
999 Associates;  
3,585 Bachelor's

**Current Overall Degree Attainment**

- 17% hold Associate's/ Certificate
- 31% hold Bachelor's or higher

**Expected STEM Job Growth**  
17% from 2014-24  
(20% Computing, 14% Engineering, 24% Advanced Manufacturing)

**STEM Wages**  
Pay is nearly twice the median income as for all workers

**P-12**

**Postsecondary**

**Workforce**

**STEM Related Data**

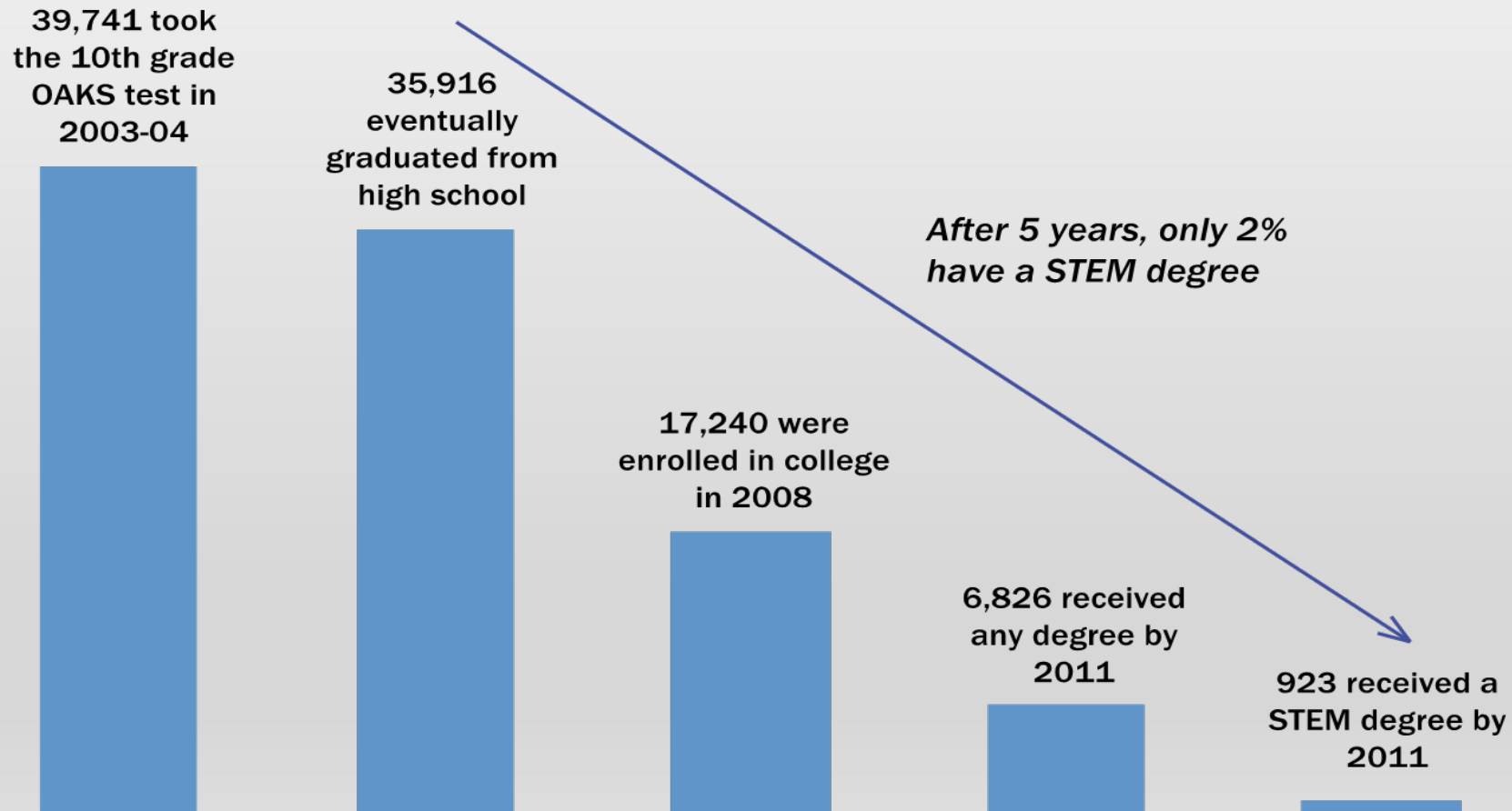
<p><b>Kindergarten</b> average 7.8 out of 16 on early math assessment</p>	<p><b>4<sup>th</sup> grade NAEP Math</b> 40<sup>th</sup> in the nation <b>Science</b> 25<sup>th</sup> in the nation</p>	<p><b>Students of Color</b> Black, Hispanic and low-income students scoring <i>significantly</i> lower than their white and higher income peers and graduating in <i>significantly</i> lower numbers</p>	<p><b>High School Graduation</b> 72% Bottom 5 in the nation (4-year grad rate)</p>	<p><b>Remediation</b> 65% of <i>all</i> community college students took a developmental math course</p> <p>More than 50% of 2-year and more than 10% of 4-year traditional college freshman require remediation</p>	<p><b>Community College Completion</b> 24% Bottom 5 states in the nation</p>	<p><b>Skill Deficits</b> Employers report students are least prepared in technology and computer skills, problem solving skills, basic technical training and math skills</p>
	<p><b>8<sup>th</sup> grade NAEP Math</b> 32<sup>th</sup> in the nation <b>Science</b> 24<sup>th</sup> in the nation</p>		<p><b>Meet or Exceed College Readiness</b> 57% in math and 49% in science (of those taking ACT)</p>			<p><b>STEM Ready</b> 81% of teachers and 89% of employers feel that OR is <i>not</i> preparing students well with STEM-related skills and mindsets</p>
						<p><b>Skills Mismatch</b> STEM employers report having too few applicants skills required to fill jobs; many go unfilled</p>



\*\*According to IPEDS data using new, more inclusive STEM definition

# Gaps Correlate with Mediocre STEM Results

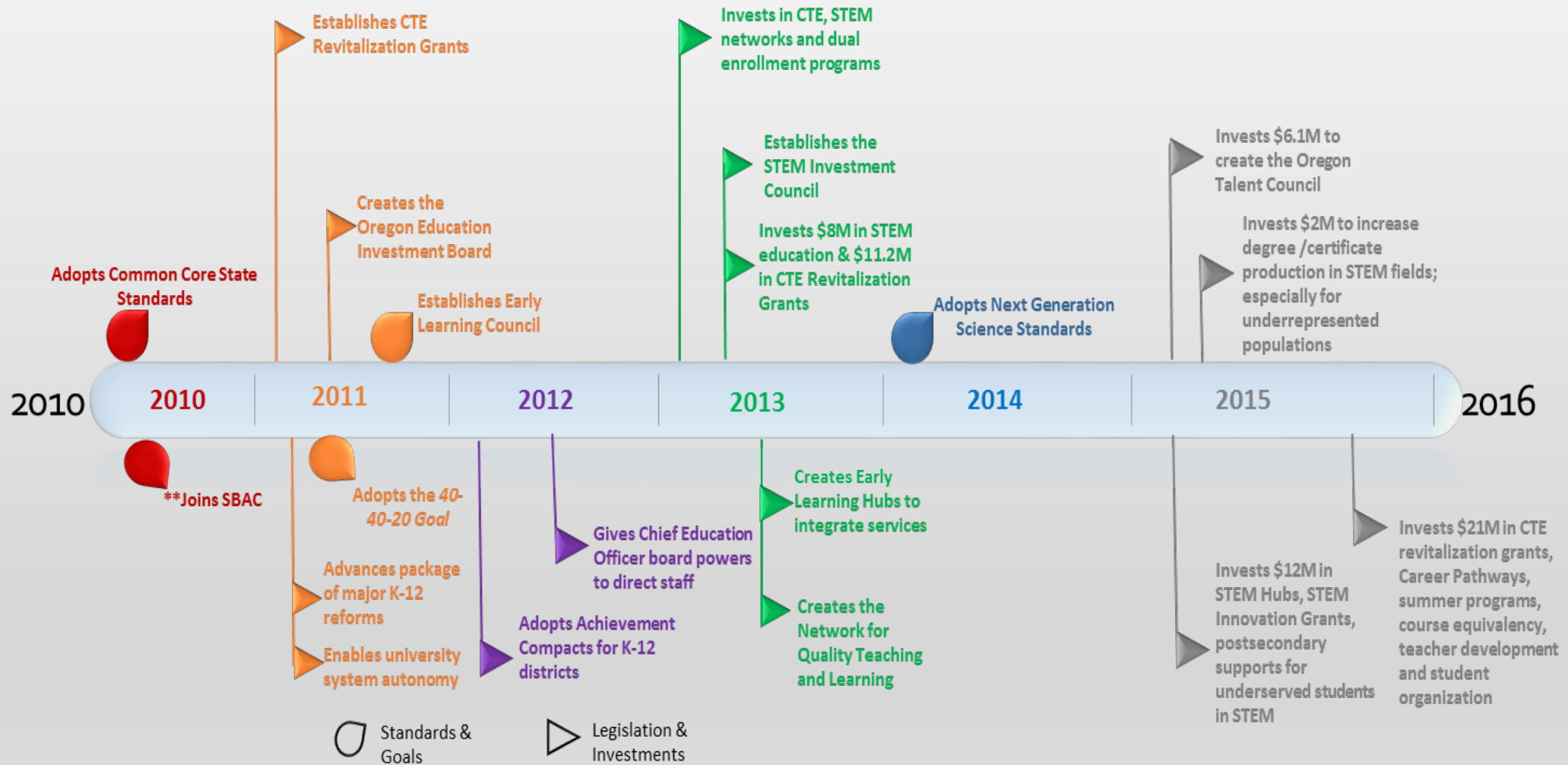
- STEM Outcomes for the Class of f2005



Source: ECONorthwest analysis of ODE and National Student Clearinghouse data.



# Closing the Gaps: STEM+CTE Education Goals, Policies and Investments



\*\*Offers an "opt-out" provision

# STEM Investment Council: *Beliefs*

All people have  
creative potential

Each student  
deserves an  
opportunity at  
prosperity

Diversity is our  
strength

Engaged learners  
succeed

Education is a  
collective  
responsibility

Innovation is the  
cornerstone of  
prosperity

Learning takes  
courage,  
persistence, and  
humility

STEM skills are  
essential skills

All learning is cross  
disciplinary

The best way to  
learn STEM is to  
DO it

# STEM Investment Council: *Goals*

-  1. **Inspire and empower our students** to develop the knowledge, skills, and mindsets necessary to thrive in a rapidly-changing, technologically rich, global society.
-  2. **Ensure equitable opportunities and access** for each and every student to become a part of an inclusive innovation economy.
-  3. **Continuously improve the effectiveness**, access to resources, and the number of formal and informal **STEM educators**.
-  4. **Create sustainable and supportive conditions** to achieve STEM outcomes aligned to Oregon's economic, education, and community goals.

# STEM Investment Council: *Goals*



**Goal #1: Inspire and empower our students** to develop the knowledge, skills, and mindsets necessary to thrive in a rapidly-changing, technologically rich, global society.

## **PRIORITY OUTCOMES:**

1. Increase time on science in elementary school.
2. Transform mathematics instruction with a focus on application.
3. Increase computer science and digital literacy.

# STEM Investment Council: *Goals*



**Goal #2: Ensure equitable opportunities and access for each and every student to become a part of an inclusive innovation economy.**

## **PRIORITY OUTCOMES:**

1. Double the number of underserved and underrepresented STEM students participating in informal, out-of-school STEM learning opportunities.
2. Double access to quality support services and pre-college transition/bridge programs.
3. Increase access to STEM role models and professional networks.

# STEM Investment Council: *Goals*



**Goal #3: Continuously improve the effectiveness, access to resources, and the number of formal and informal **STEM** educators.**

## **PRIORITY OUTCOMES:**

1. Provide sustained, high-quality professional development opportunities to at least 50 percent of Oregon's STEM educators.

# STEM Investment Council: *Goals*



**Goal #4: Create sustainable and supportive conditions** to achieve STEM outcomes aligned to Oregon's economic, education, and community goals.

## PRIORITY OUTCOMES:

1. Double the state's STEM & CTE investment.
2. Create a data dashboard of key STEM.

# Tracking Our Progress

## Data & Metrics Subcommittee workplan

- Develop both leading and lagging indicators that enable us to:
  - 1) Communicate and monitor the change that we seek (data dashboard)
  - 2) Assess the effectiveness of Hubs and other investments
- Collect longitudinal data to track student progress
- Assess the alignment of selected indicators with outcomes



# Tracking Our Progress

## Elementary

- Kindergarten readiness in math
- Elementary time on science
- 4th Grade math and science achievement scores

## Middle School

- Expressed interest in STEM
- Underserved students participating in out-of-school STEM programs
- 8th grade math and science achievement scores

## High School

- 9th/10th grade STEM-CTE participation rates
- High school graduation rates
- Students declaring a postsecondary STEM interest

## Post-secondary

- Enrollments in developmental mathematics
- Underserved student participation in STEM-related research opportunities and internships
- Postsecondary STEM degrees and certificates

## Workforce

- Time to fill STEM job openings
- Employment rates within one year of credential
- % of imported talent

# Feedback

<https://www.surveymonkey.com/r/99K752J>

## Next Steps

- **Incorporate additional feedback from Summit**
- **Agency & Board discussions**
- **Regional discussions in February/March**
- **Finalize plan**
- **Launch in May**