



# STEM - Strategic Plan Development Subcommittee

MEMBERS: Thompson Morrison (Chair), Herb Fricke

**March 20, 2015**

**9:00am – 11:00am**

University Technology Services Building, Room 503  
Portland State University, 2125 SW 4th,  
Portland OR 97201

JIM PIRO, Chair

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## **AGENDA**

### **1. Review of progress**

### **2. STEM Hub Outcomes Framework**

### **3. Draft Goals and strategies**

### **4. Public Comment**

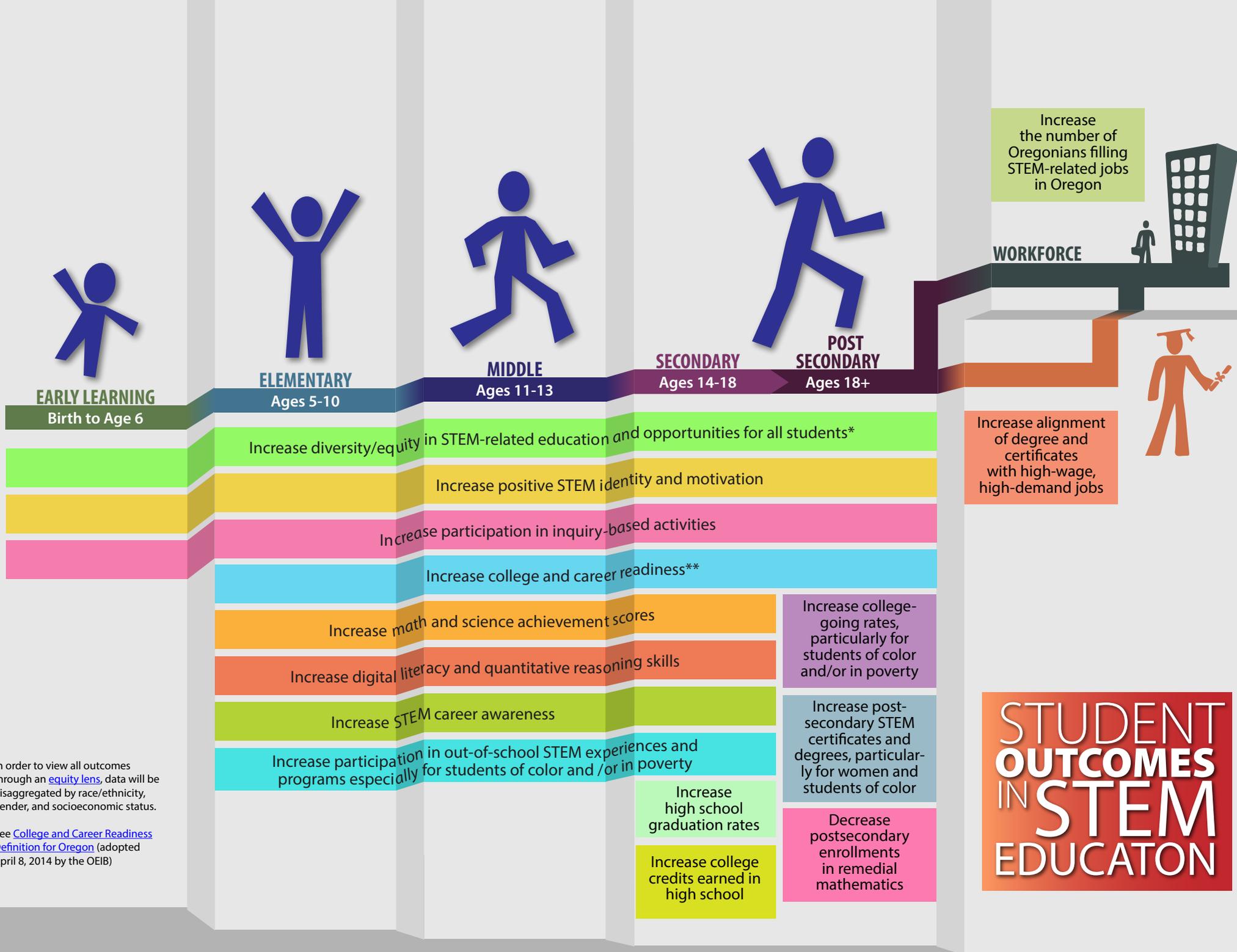
*Members of the public wanting to give public testimony must sign in.*

*There will only be one speaker from each group.*

*Each individual speaker or group spokesman will have three (3) minutes.*

*All meetings of the STEM Investment Council are open to the public and will conform to Oregon public meetings laws. The upcoming meeting schedule and materials from past meetings are posted online. A request for an interpreter for the hearing impaired or for accommodations for people with disabilities should be made to Seth Allen at 503-378-8213 or by email at Seth.Allen@state.or.us. Requests for accommodation should be made at least 48 hours in advance.*





\* In order to view all outcomes through an [equity lens](#), data will be disaggregated by race/ethnicity, gender, and socioeconomic status.

\*\* See [College and Career Readiness Definition for Oregon](#) (adopted April 8, 2014 by the OEIB)

# STEM Hub Shared Outcomes Framework\* - DRAFT

## Shorter-Term Outcomes (1-2 years)

## Longer-Term Outcomes (3-5 years)

### Student Outcomes (Disaggregated by Student Characteristics)

Increase participation in inquiry-based activities

Increase positive STEM identity and motivation

Increase participation in out-of-school STEM experiences and programs, especially for students of color and/or in poverty

Increase STEM career awareness

Increase college and career readiness\*\*

Increase digital literacy and quantitative reasoning skills

Increase students taking STEM-related elective courses

Increase access to, and participation in, undergraduate research opportunities and internships

Increase math and science achievement scores

Increase high school graduation rates

Increase early college credit in STEM subjects

Increase college-going rates, particularly for students of color and in poverty

Decrease postsecondary enrollments in remedial mathematics

Increase postsecondary STEM certificates and degrees, particularly for women and students of color

### K-16 Formal and Informal Educator and Administrator Outcomes

Increase time allocated for science instruction in elementary school

Increase interactions between educators and STEM professionals in classrooms, workplaces, and the community

Increase educator access to high-quality STEM professional development and resources

Increase educator access to high-quality professional development on digital literacy and quantitative reasoning

Increase availability of high-quality instructional materials and resources that support and promote effective STEM education

Increase educator pedagogical content knowledge in STEM subjects

Increase educator understanding of how STEM content is applied in STEM fields

Increase educator confidence in teaching digital literacy and quantitative reasoning skills

Increase educator confidence in teaching STEM subjects

Increase educator use of inquiry-/problem-based learning approaches

\* Whether outcomes are short-term or longer-term may depend on the developmental stage of the collaborative.

\*\* See College and Career Readiness Definition for Oregon (adopted April 8, 2014 by the OEIB)

## Shorter-Term Outcomes (1-2 years)

### Community Outcomes

Increase parental and community awareness of the value of STEM education and career opportunities

Increase parental and community support for STEM education programs

Increase partnerships between educational institutions and local stakeholders/businesses

Increase availability and access to community-based out-of-school STEM programs

### Workforce Outcomes

### STEM Hub Infrastructure Outcomes

Governance includes high-level leadership from multiple sectors and community stakeholders, including workforce development, industry, and P-20 education

Leadership includes partners from culturally and linguistically diverse backgrounds

Partners implement an aligned plan of action to address a common agenda

STEM Hub plan includes regular monitoring of data focused on improving outcomes

## Longer-Term Outcomes (3-5 years)

Increase the number of Oregonians filling STEM-related jobs in Oregon

Increase alignment of degree and certificates with high-wage, high-demand jobs

An efficient and effective backbone infrastructure with clearly defined roles and responsibilities is maintained

Regional efforts are aligned to reduce service gaps and overlaps in STEM education programming to improve outcomes

Sustained human, financial, and in-kind support from partners and external sources

Structures and processes are in place to share data and support ongoing learning related to STEM Hub efficiency and effectiveness

### System-Level Support Strategies

Build relationships and trust to improve feedback loop between policy and practice	Sustained investment in STEM Hub backbone infrastructure and programs	Build STEM Hub capacity through organizational support	Provide support and training in implementing the equity lens in STEM Hub work	Foster cross-STEM Hub learning networks	Provide support for communication and community outreach	Provide STEM Hub support for data, research, and evaluation	Advocacy for ongoing STEM education investments
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# The Oregon STEM Manifesto

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## Our Vision

Reimagine and transform how we educate and empower individuals and communities to build an inclusive, sustainable, innovation-based economy. Oregonians of all races, economic status, and locations have developed the fundamental STEM 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 condition

## Our Beliefs

1. **All people create.** Our students should not just be consumers of knowledge, they need to be creators of it in a way that unleashes their creative genius, interests, and talents.
2. **Each student deserves an opportunity at prosperity.** There continues to be persistent inequities in race, ethnicity, gender, and among students of color in high-wage, high demand professions. Further, many students in poverty and from rural areas are being left behind. No talent should be left behind in light of the STEM talent shortage.
3. **Diversity is our strength.** Differences of gender, ability, race, ethnicity, and ability to provide critical perspectives and voices to address today's complex challenges. Innovation emerges where different ideas and cultures interconnect.
4. **Engaged learners succeed.** *How* we teach our students is as important as *what* we teach them. We must create meaningful learning experiences that empower all students to embrace their curiosity and take ownership of their learning.
5. **Education is a collective responsibility.** Effective STEM learning takes place both in and outside of classrooms. Everyone in our community is a potential educator and we need to build solutions that develop partnerships with all of the human capital in our communities.
6. **Innovation is the cornerstone of prosperity.** STEM is not just about filling jobs but creating jobs. Building an innovation-based economy is essential for long-term prosperity resulting in competitive advantage in a global marketplace.
7. **Learning takes courage, persistence, and humility.** Pushing the boundaries of one's understanding requires us to embrace ambiguity and to take intellectual risks. What we do with what we don't know is as important as what we do know. We should prioritize questions over answers.
8. **STEM skills are essential skills for all students.** Advancements in technology and information are transforming every industrial sector from agriculture to energy, medicine to manufacturing, forestry to nanotechnology.
9. **All learning is cross disciplinary.** It is the interconnectedness of ideas that enable people to integrate new learning with their prior experiences. STEM by its nature synthesizes analytical and creative thinking. It is a powerful tool that sits at the crossroads of the sciences, arts and humanities.

## The Oregon STEM Manifesto

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10. **The best way to learn STEM, is to DO it.** Education is not about retaining facts or disconnected bits of information. Utilizing purpose driven learning challenges students to pursue deeper questions and to solve problems that are relevant and meaningful.

### Our Goals

1. Increase number and diversity of students who successfully complete post-secondary credentials (degrees and certificates) in high-demand STEM-related careers.
2. Increase student aspiration, skills and knowledge in STEM by increasing literacy, confidence, awareness, and achievement for all students.
3. Each Oregon student needs access to effective STEM instruction and high-quality hands-on learning environments, both in, and out of school.
4. Increase the quantity and effectiveness of P-16 STEM educators, both in and out of school.
5. Build public awareness and support - Increase the understanding of Oregonians about the critical importance of STEM to their own economic competitiveness and to that of the state.

### Our Plan

1. **Build statewide partnerships for STEM education.** Utilizing Regional STEM Hubs and other professional networks, we will connect, align and leverage assets from around the state to develop and disseminate promising practices and resources for STEM education. At a local level, STEM practitioners, educators and local businesses will work closely to increase access and quality of STEM educational experiences both in and out of school. Support for this connected ecosystem of practitioners is essential to increase communication, spreading strategies that work, learning with and from each other, and providing critical feedback to inform policy and investment decisions.
2. **Change the perception of STEM careers.** Working with industry and institution partners, we will develop a statewide marketing campaign that conveys the creative nature of these careers and encourages participation of all members of our community, particularly reaching communities of color. The campaign will also convey to all Oregonians the relevance and importance of technology-enabled innovations to drive economic growth in all sectors of economy. Locally, there also needs to be more opportunities for students to interact with STEM employees and to engage in apprenticeships, internships, and research.
3. **Create transformative professional development for our educators and educational leaders.** Quality learning requires knowledgeable, confident, and supported educators. In order to realize our vision for richly-contextualized, purpose-driven educational experiences for students, educators must have the opportunity to deepen their own learning, transform the professional culture in their schools, and have the opportunity to interact with peers and STEM professionals. STEM education not only

## The Oregon STEM Manifesto

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opens the door to new toolsets and mindsets, but also shapes new learning models that will impact all areas of education and better inspire life-long educational journeys.

4. **Develop a sustainable funding and policy environment.** In order to realize these these transformational aspirations, we must create the enabling conditions for change to occur. This will take a combination of leadership, resources, collective will, and outcomes-oriented funding. Our plan aligns corporate, state and philanthropic resources to provide stable funding streams that lead to sustained change.

# The Oregon STEM Manifesto

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## Meeting Notes

### Tactics

1	2	3	4	5

## The Oregon STEM Manifesto

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### Notes

*Elevator*

Innovation is the cornerstone of prosperity

The way we educate needs to be reimagined

STEM skills are essential skills for all students

[STEM skills are foundational skills for all students?](#)

[Engaged STEM learners succeed \(or succeed in the workforce\)?](#)

[STEM literacy drives the economy.... STEM literacy opens doors for students?](#)

[Some version of the quote:](#)

["Tell me and I forget, teach me and I may remember, involve me and I learn."](#)

[— Benjamin Franklin](#)

leading to engaged learning, persistence, creativity, and innovation

Imagine curiosity unleashed.

# The Oregon STEM Manifesto

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Goal	Strategies
Align supply & demand	
Increasing potential	
Broader Access	
Improve capacity	utilizing workforce assets
Build awareness & support	