STEM Investment Council

August 5, 2020

1:00pm – 4:00pm

Meeting Link: Join Microsoft Teams Meeting

Call-in Number: 929-229-5751 Conference ID: 651 772 94#

Members of the public must submit written public comment to Sydney.G.King@oregon.gov 24 hours prior to the meeting.

Members:

STEFAN BIRD, *Chair*
MARCELINO ALVAREZ
HERB FRICKE
RITA HANSEN
MARV NELSON
LISA POWELL
NIKKI SALENGER
PAUL STEWART

Advisory Members:

BETH ALCOULARME
YOLANDA COLEMAN
MELISSA DUBOIS
PRESTON EAGLEHEART
ANDY GRZESKOWIAK
JESSICA HOWARD
KATRINA HULL
ANDREW LATTANNER
NAGI NAGANATHAN
KYLE RITCHY-NOLL
SUSAN SHUGERMAN
CARA SNOW
LELA THIEME
TONG ZHANG

Technical Advisors:

KAREN HUMELBAUGH
Director, Office of Workforce Investments

KURT TACKMAN
Deputy-Director, Office of Workforce Investments

STEM Staff:

JULIA STEINBERGER
Director

SYDNEY KING
Board Administrator

AGENDA

1:00 pm	**1.0**	**Welcome and Introductions**	
1:00 pm	1.1	Member introductions	Stefan Bird
1:05 pm	1.2	Review agenda	Stefan Bird
1:10 pm	**2.0**	**Public Comment**	
		Each Individual/Group will have a time limit of three minutes	
1:10 pm	2.1	Invited public comment	Public
1:15 pm	2.2	Other public comment	Public
1:25 pm	**3.0**	**Consent Agenda**	
1:25 pm	3.1	CONSENT ITEM: Approve April 2020	Stefan Bird
1:30 pm	**4.0**	**Director's Update**	
1:30 pm	4.1	Legislative and Budget Updates	Julia Steinberger
1:45 pm	**5.0**	**Oregon Department of Education Update**	
1:45 pm	5.1	Miscellaneous Updates	Alexa Pearson, Deb Bailey, Tom Thompson
2:00 pm	**6.0**	**STEM Hub Updates**	
2:00 pm	6.1	Frontier STEM Hub Update	Nickie Shira
2:10 pm	6.2	OCF Grant Update	Myronda Schiding
2:30 pm		**Break**	

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STEM Investment Council

August 5th 2020 AGENDA (continued)

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2:40 pm	**7.0**	**STEM Education Plan Draft**	
2:40 pm	7.1	Overview of STEM Education Plan draft	Julia Steinberger
2:50 pm	7.2	Discussion of STEM Education Plan draft	All
3:30 pm	**8.0**	**STEM Innovation and Hub Backbone Grants**	
3:20 pm	8.1	Update on Innovation Grant projects	Deb Bailey, Tom Thompson
3:30 pm	8.2	Deliverables and data collection	Deb Bailey, Tom Thompson
3:50 pm	**9.0**	**Wrap-up**	
3:50 pm	9.1	Other comments, questions, or concerns?	Stefan Bird
3:55 pm	9.2	Next steps	Stefan Bird

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STEM Investment Council

MEETING MINUTES

April 29th, 2020
1:00pm – 4:oopm
Skype meeting

Members:

STEFAN BIRD, Chair
MARCELINO ALVAREZ
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MARV NELSON
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SYDNEY KING
Board Administrator

MEETING MINUTES

Members Present:	Stefan Bird (Chair), Herb Fricke, Rita Hansen, Nikki Salenger, Paul Stewart
Advisory Members Present:	Melissa Dubois, Preston Eagleheart, Andy Grzeskowiak, Katrina Hull, Andrew Lattanner, Nagi Naganathan, Susan Shugerman, Tong Zhang
Ex-Officio, Technical Advisors and Staff Present:	Sydney King, Brittany Melzer, Julia Steinberger

1.0 Welcome & Meeting Overview

1.1 Chair Bird called the meeting to order at 1:03pm. He made introductions and reviewed the agenda.

2.0 Consent Agenda

2.1 ACTION ITEM: Melissa Dubois motioned to approve the January 2020 Minutes. Rita Hansen seconded the motion. No discussion. Motion approved.

2.2 ACTION ITEM: Rita Hansen motioned to vote to approve the November 2019 minutes. Nikki Salenger seconded. Some discussion as to why the November minutes are being passed in this meeting. Motion approved. Motion passed.

2.3 ACTION ITEM: Rita proposed a motion welcoming Kyle Ritchey-Noll and Beth Alcoularme as official advisory members to the STEM Investment Council. Paul Stewart seconded. Motion approved. Motion passed.

3.0 Public Comment

Each Individual/Group will have a time limit of three minutes

3.1 Invited Public Comment: None

3.2 Other Public Comment: None

4.0 Directors Update

4.1 Director Steinberger is working with Oregon Employment Department keying in Unemployment claims to assist with the workload.

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4.2 HECC is moving forward with the policy and legislation process on schedule. The Governor has asked to run a budget exercise and as the budget forecast comes out we will have a better idea of where the program is headed.

5.0 ODE Updates

5.1 Alexa Pearson, Director of Standards and Instructional Support for the Oregon Department of Education, along with her staff, Deb Bailey and Tom Thompson, gave a short presentation regarding ODE's response to the COVID-19 pandemic. Guidance for all grades is finished for the school year, and now their focus is shifting to fall and the next school year. ODE is keeping an equity lens on their guidance.

5.2 Deborah Bailey gave a report on Stem Innovation Grants. 11 of 15 of them are done. Due to Covid-19 the overall intent of grant and deliverables need to be examined and possibly changed.

5.3 Tom Thompson presented on Innovation Grant work that has been moving forward despite school closures. The dominant theme is the transition to a virtual system for summer. Fundamentally there will be changes with online and distance learning, adjustments will be made over time.

6.0 STEM Hub Updates

6.1 Melissa Dubois discussed how the STEM hubs are pivoting from their scheduled work to accommodate the unprecedented needs of the current climate with Covid-19. The Hubs are redirecting funds, adjusting deliverables, and increasing Oregon Connections usage among all users. They are organizing and promoting STEM Week Oregon, which is May 9th-17th.

6.2 Heidi Larwick gave a presentation on the Hub Network OCF Grant. There have been conversations around individual Hubs that are funded, and those conversations have focused on best practices. She outlined that they plan to use $10,000 of OCF funding to hire a part time consultant for the paperwork process involved.

7.0 Director Update

7.1 Director Steinberger went over the recommendations made for changes to the legislative and budget document. There was general agreement on the proportional increase in funding requests. Establishing the funding baseline is critical to keeping the Hubs funded. Council members discussed the letter. Julia will edit the letter, send it out to the Council, and the voting members will respond with a yes if they approve. Approving will represent a yes vote with your name and business attached. Discussion on inviting the Ethics Committee to visit

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the Council and provide advice on what is and is not allowed to push for STEM legislation.

8.0 STEM Education Plan Survey

8.1 Director Steinberger presented the survey that recently went out to all Hubs and highlights their common goals and aspirations. There was discussion on the results, and the consensus was to focus efforts on differentiating the short, mid and long term goals of the plan, as well as to use measureable metrics to gauge success with goals.

10.0 Adjourn

Chair Stefan Bird adjourned the meeting at 3:29pm.

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Docket Item: **5.1 ODE Update**

Docket Summary:

Alexa Pearson will provide an update on STEM Innovation Projects. This includes budget, potential cuts, and how that will affect the STEM system. She will also provide updates on federal grants, new hires, and funding for STEM programs. Guidelines for how COVID-19 and returning to school have been released by ODE, so Alexa will review guidelines with the STEM Council and how hybrid learning will work.

Docket Materials:

ODE Update Powerpoint

Staff Recommendation:

None. This is an informational item only.

ODE Update STEM Investment Council

August 5, 2020

ODE Update Topics

- Budget - STEM Hubs
- Other General Updates
  - Federal Grant
  - Hub Director Hiring
  - POP
  - Digital Director and SPST Director Hire
  - Oregon Open Learning Hub
- School Year 2020-2021 Guidance and Governor’s Announcement

STEM Budget

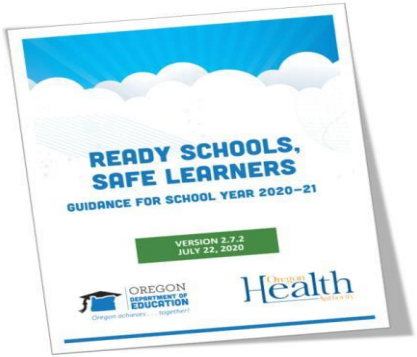
- Proposed ODE Budget Reduction - 8.5%
- Met with Hubs to share proposed budget details
- Impact on STEM Network and Innovation Grants
  - Elimination of Network Development Funds
  - Reduction of Network budgets - 3.25%
  - Reduction of Innovation Grants - 8.15%

Other Updates

- Federal Well Rounded Education Competitive Grant - ~$10 M
  - 5 years
  - Focus on STEM and Arts
  - Announcement late August
- POP 109 - STEM Programs for Diverse Learners
  - Mathematics - $2.5 M New Funding
  - STEM Network and Innovation Grants - $3.0 M over CSL
- New Hub Director - Mid-Valley CTE-STEM Hub (Sarah Whiteside 8/2/20)
- New Director Hire for East Metro STEM Partnership in final stages
- 1 year Interim Director established for Coast STEM Hub

Ready Schools, Safe Learners

July 23, 2020



Ready Schools, Safe Learners:
Community COVID-19 Metrics
Released 7/28/2020

Bigger Picture

Policy Framework	Guidance	Implementation
Ready Schools, Safe Learners returns to *decentralized* decision- making with clear and evolving health and safety and instructional parameters.	With the authority and responsibility of Governor Brown's Executive Order 20-29, ODE and OHA provide detailed requirements *and* recommendations for K-12 schools and related programs.	ODE offers support and coordination at state and regional levels while school, health, and community leaders do the hard work of putting into action their own values and strategies to ensure safety and education for students within the context of the guidance and framework.

Summary of Major Changes

- Clarifying roles and authorities
- Cohorting Parameters
- Face coverings
- Enrollment
- Attendance
- Instructional Time

** Next ODE Guidance Iteration is August 11*

Cohorting Parameters

Cohorts help manage risks in the potential spread of COVID-19. In particular, the size of the cohort matters for risk management. Student cohorting: (1) limits the number of exposed people when a COVID-19 case is identified in the school, (2) quickly identifies exposed individuals when a COVID-19 case is identified, (3) minimizes school-wide disruptions in student learning. (pg. 23)

- *Students cannot be part of any single cohort, or part of multiple cohorts that exceed a total of 100 people within the educational week. Schools should plan to limit cohort sizes to allow for efficient contact-tracing and minimal risk for exposure.*
- *A smaller cohort size of 24-36 is recommended for public health and safety.*

Face Coverings

Face coverings are now required for all students in grades kindergarten and above along with all staff. *Certain accommodations are noted in the guidance . . . (pg. 26)*

Students who abstain from wearing a face covering, or students whose families determine the student will not wear a face covering, during On-Site instruction must be provided access to instruction.

Comprehensive Distance Learning may be an option, however additional provisions apply to students protected under ADA and IDEA.

Face covering: A cloth, paper, or disposable face covering that covers the nose and the mouth; may or may not be medical grade.

Face shield: A clear plastic shield that covers the forehead, extends below the chin, and wraps around the sides of the face.

Clear plastic barriers: A clear plastic or solid surface that can be cleaned and sanitized often.

Attendance

For On-Site Instructional Models, prior attendance and reporting practices are unchanged and should meet the requirements described in this section and can be informed by the recommendations presented.

For any Hybrid Instructional Model or Comprehensive Distance Learning, ODE is establishing the following definitions and guidance:

- *Attendance includes both participation in class activities and interaction with a licensed or registered teacher during a school day or interactions with educational assistants and paraprofessionals through teacher designed and facilitated processes.*
- *Interaction can be evidenced by any of the following or reasonable equivalents:*
  - *Participating in a video class;*
  - *Communication from the student to the teacher via chat, text message or email;*
  - *A phone call with the student, or, for younger students, with the parent;*
  - *Posting completed coursework to a learning management system or web-based platform or via email; or*
  - *Turning in completed coursework on a given day.*
- *When there is no evidence of student interaction during a 24-hour period surrounding a scheduled school day as described, students are reported as absent. A day present for attendance may not be claimed for weekends or holidays, per ORS 336.010 and 187.010, or any other day during which a licensed or registered teacher is not available to students.*

Instructional Time

As we work to prioritize student learning in the coming school year, a common approach to instructional time requirements that apply across every instructional model and to every public school district, public charter school, and virtual public charter school are critical. (pg. 47)

For students not attending in-person through the On-Site Instructional Model, at least 50% of instructional time (as defined above) must meet the criteria for teacher-facilitated learning.

OREGON DEPARTMENT OF EDUCATION

INSTRUCTIONAL TIME

2020-21 SCHOOL YEAR

TEACHER-FACILITATED ≥ 50% + APPLIED LEARNING ≤ 50% + OTHER

Synchronous/Asynchronous learning experience planned and guided by a licensed teacher.

Synchronous opportunities, either on-site or off-site, must be provided daily and may include full group instruction, peer interaction, two-way communication, small group breakouts, or individual office hours.

Learning experiences that allow for students to apply knowledge and skills that extend from the teacher-facilitated learning. Students have access to instructional support during applied learning activities, provided by educational assistants, teachers, and/or related service providers.

- Teacher Professional Development
- Parent/Family Contacts (guidance, support, communication, and parent/teacher conferences)

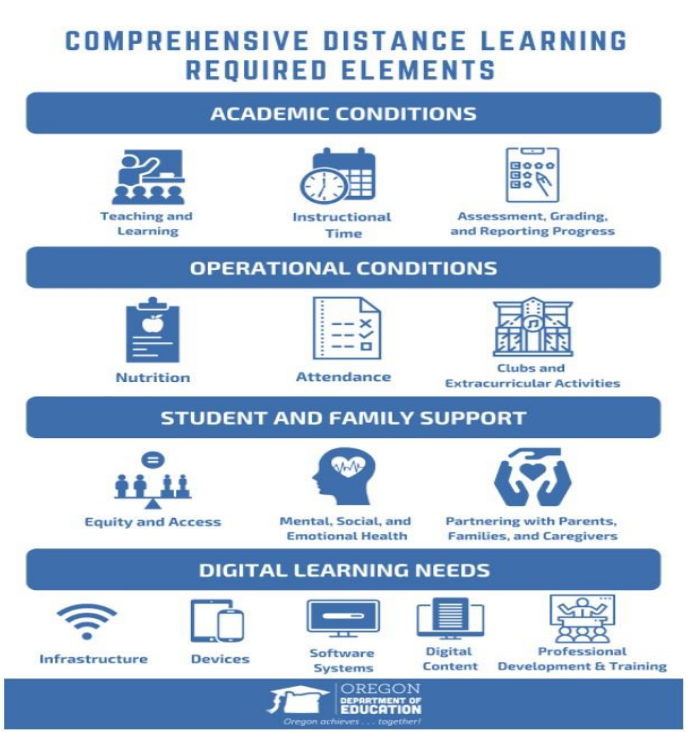
WITH STATE BOARD APPROVAL, DIVISION 22 REQUIREMENTS EXPANDED TO ALLOW FOR UP TO 90 TOTAL HOURS, ANNUALLY, FOR TEACHER PROFESSIONAL DEVELOPMENT & PARENT CONTACTS

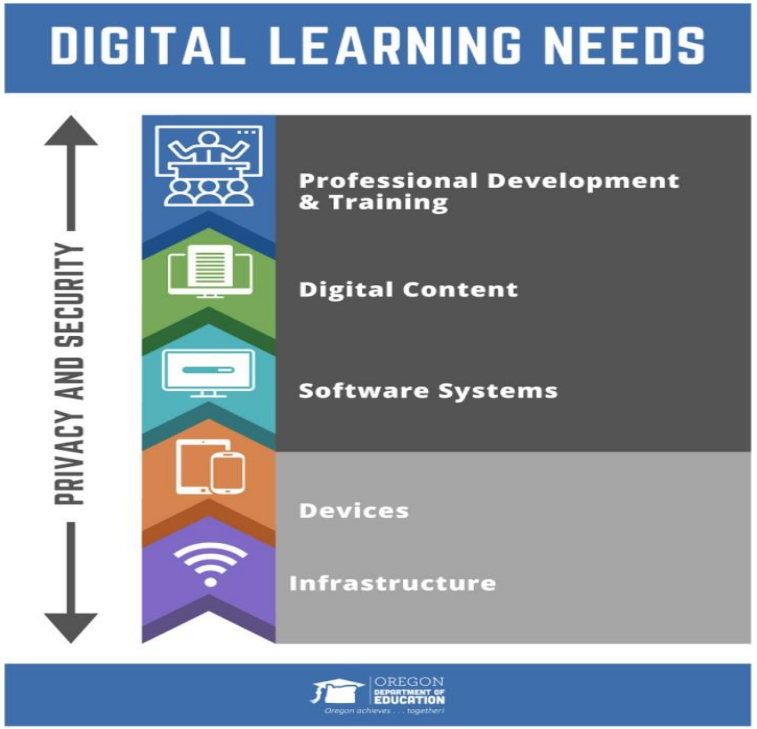
Instructional and Extracurricular Activities Requiring Additional Consideration

Beyond the general considerations outlined above there are program specific guidelines that will help administrators and educators plan for classes requiring additional considerations. Use the linked guides to develop implementation plans.

- Career and Technical Education
- Laboratories
- Visual and Performing Arts
- Physical Education
- Driver Education
- Athletics

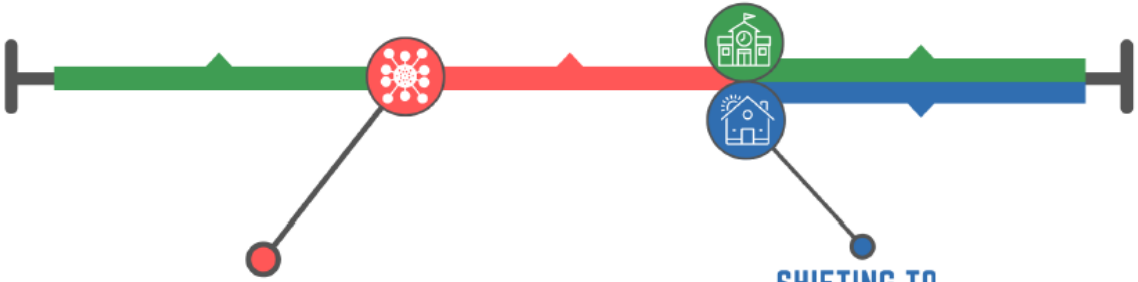
Comprehensive Distance Learning





OREGON DEPARTMENT OF EDUCATION

SHORT-TERM DISTANCE LEARNING TIMELINE



RESPONSE TO OUTBREAK

Districts, schools, and programs need to flexibly plan to use multiple models throughout the school year to meet evolving health conditions. Even when the primary plan is through an On-Site or Hybrid learning model, Short-Term Distance Learning may be required due to outbreaks.

SHIFTING TO COMPREHENSIVE DISTANCE LEARNING

Due to the unpredictability of which schools might be impacted by emergency closures, all schools will need to plan for Short-Term Distance Learning and be prepared to ramp up to Comprehensive Distance Learning if the closure extends beyond four weeks.

OREGON DEPARTMENT OF EDUCATION

Oregon achieves . . . together!

Docket Item: **6.1 STEM Hub Update**

Docket Summary:

Myronda Schiding, Director of the Northwest STEM Hub will present and update the Oregon STEM Hubs establishing a statewide nonprofit. The STEM Hubs are using the OCF Ignite grant funds and Oregon Solution's technical assistance to continue to lay the foundation for the statewide nonprofit, which will support sustainability of the STEM Hubs and provide strategic, cohesive leadership for the statewide network.

Docket Materials:

Oregon STEM Statewide Nonprofit one-pager

Staff Recommendation:

None. This is an informational item only.

Oregon STEM Statewide Nonprofit - *one pager draft*

Purpose

Oregon STEM hubs have collaboratively developed a shared commitment to move partners toward the development of a formal statewide non-profit that will have the ability to secure additional statewide resources, engage industry partners, and share resources across the state. Oregon STEM, a 501c3, will operate using an infrastructure separate from any one hub but is committed to providing strategic leadership and securing resources that advance each hub's regional STEM needs and the larger mission of serving all Oregon communities.

Relationships

Oregon STEM with ODE and the STEM Investment Council – Oregon STEM will work in collaboration with ODE and the STEM Investment Council to discover shared STEM goals and provide supplemental resources to advance Oregon STEM's goals.

Oregon STEM Hubs' fiscal sponsors – Oregon STEM will provide additional revenue as an independent infrastructure that will advocate for and secure funding as a 501c3.

Ask

Board Members:
To serve as a Board Member on Oregon STEM – Serve two years on the founding Board of Directors of the non-profit Oregon STEM. Founding board members will hire an executive director and then work collaboratively to pursue the purpose of Oregon STEM. They are expected to attend a majority of the meetings, which will occur 4-12 times per year, likely at rotating locations with remote joining options.

Financial Contribution:
To pledge a financial contribution to Oregon STEM – The founding fundraising goal is $1 million, with a likely $1 million match from the Oregon Community Foundation

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Next steps for planning team & STEM Hub Network (directors):

- Draft a script
- Identify next steps to approach state funders
- Identify next steps to recruit board members – identify criteria for a board member, what does follow up look like
- Develop timeline – who is going to submit the OCF grant and move this work forward

Docket Item: **6.2 Frontier STEM Hub Update**

Docket Summary:

Nickie Shira, STEM & Innovation Coordinator for the Frontier STEM Hub will give a short presentation regarding Frontier STEM's response to COVID-19. Students, families, and educators across the country are facing unprecedented challenges due to the current pandemic. To meet those challenges, Frontier STEM Hub is:

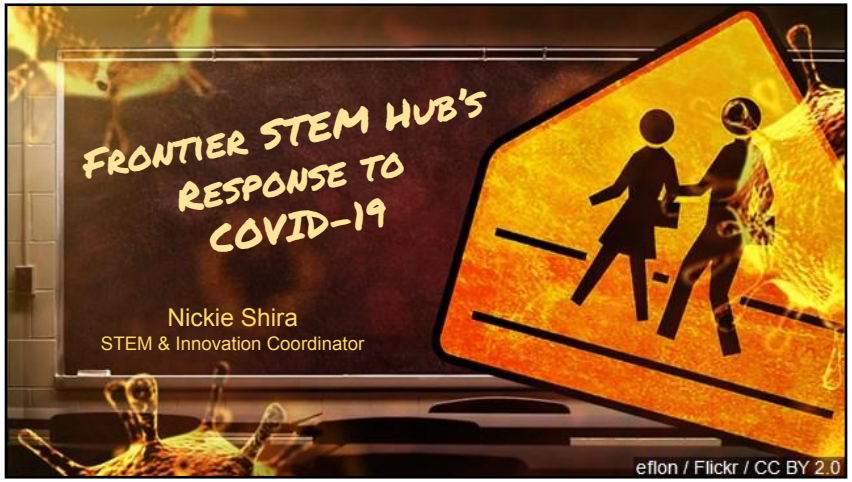
- Connecting support to provide families in need with internet access
- Providing professional development to equip educators as they transition to distance education
- Equipping students to utilize their STEM skills to produce much needed PPE for local communities
- Supporting and promoting the use of Oregon Connections to connect industry professionals to students and teachers
- Facilitating a virtual platform and community of practice for Chief Science Officers from across the state to continue to learn, grow, and connect as STEM leaders
- Continuing to engage in and support the strong collaborative efforts of the Oregon STEM Hub Network

Docket Materials:

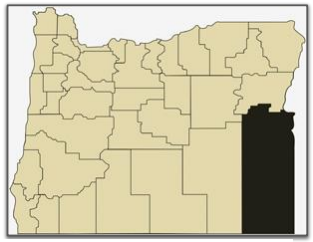
Slideshow Presentation

Staff Recommendation:

None. This is an informational item only.



Our Region



Median income

Malheur	$37,112	**Ranks 34th**
Oregon	$56,119	

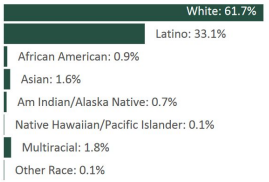
Source: Oregon By the Numbers 2019

Total population
30,421

Rural population
48%

Net migration, 2010-2017
(per 1,000 population)
-13 **Highest in the state**

Population by race/ethnicity



Broadband Internet Access for Rural Districts

- Malheur County 75% vs Oregon Average 93%
  - Bottom third in the state
- Supported administrators and districts by researching internet providers
  - Service discounts and agreements
  - Service areas
- Sought and secured financial support to provide internet access for families in need
- Impact
  - Immediate internet access for over 20 families

Transition to Distance Education

- Immediate professional development for districts
  - Zoom
  - Google Classroom
  - Individualized sessions for educators who needed extra support
- Identifying best practices for equitable remote learning
- Collaboration with Eastern Oregon REN
  - Designed 4-Week Summer Course for Educators
  - 60 educators participated
  - Website with resources for ongoing support

Supporting and Promoting the use of Oregon Connections

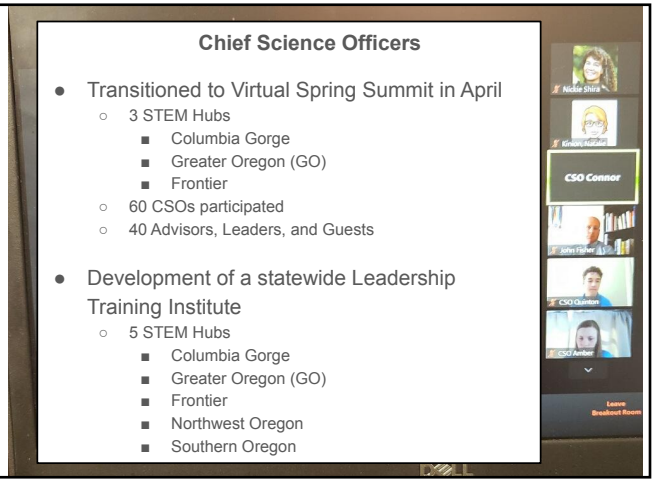
Perfect tool to support distance learning

- **Connecting industry to classrooms**
  - Virtual classroom visits/presentations
  - Virtual industry tours
  - Project mentorship
  - Project judging/presentation/assessment
- **Site Licensing agreement**
  - Increase access

STEM Leaders respond to shortage of PPE

- Provided equipment, supplies, and support for student leaders
- Increased connections to industry and community partners
- Real-world connections

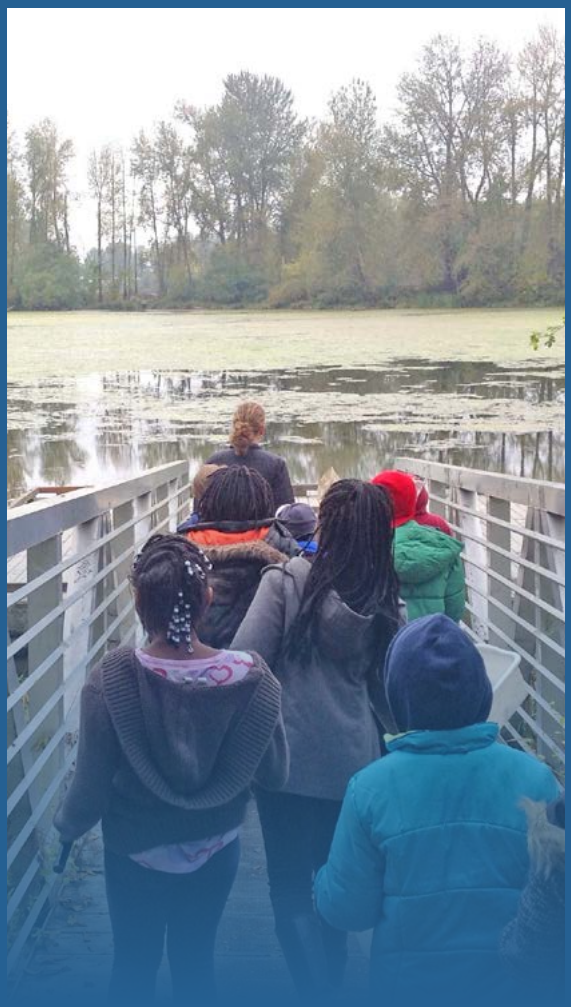
"It's so neat to see Malheur County STEM students finding real-world applications to their work. This donation enhances our efforts to remain ready and safe for all patients who come our way."
~A. LaRosa, RN, Manager of Emergency Services at Saint Alphonsus

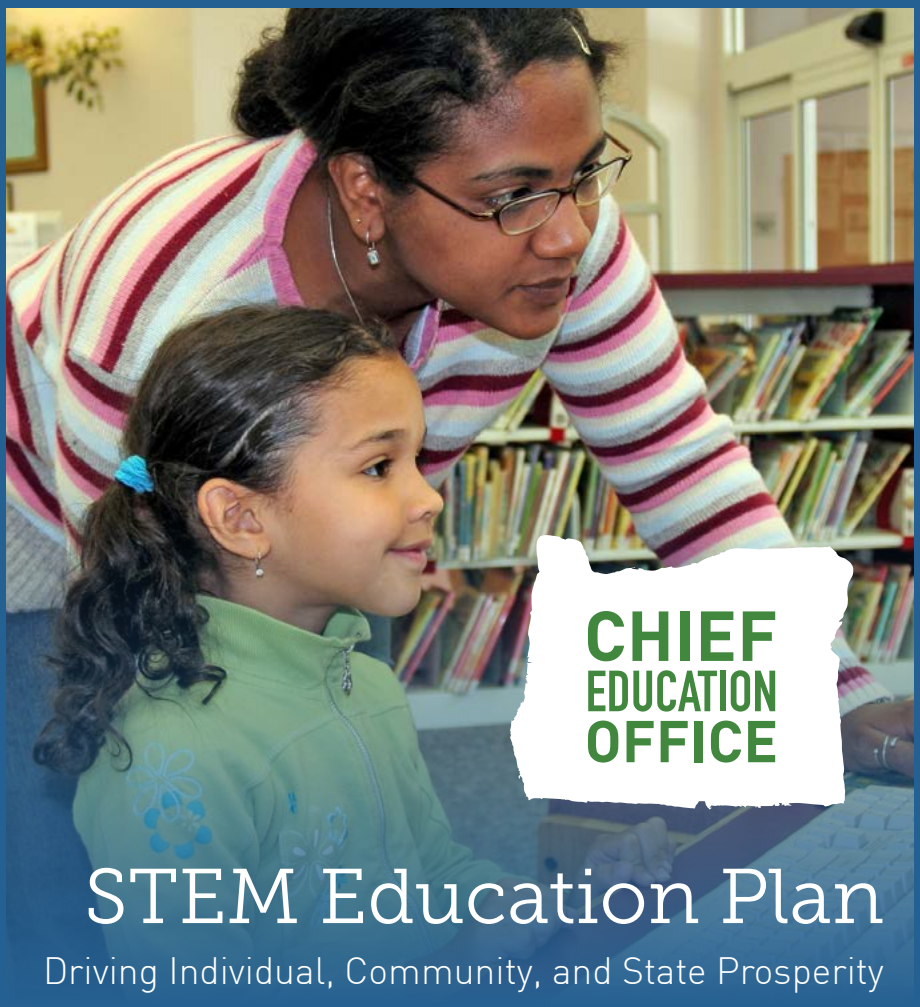


Collaborative STEM Hub Network

- STEM Week
  - May 9th-17th
- Development of hands-on STEM learning experiences
  - Supporting educators
    - Oregon Educator Network
  - Engaged learners
    - Focus on unplugged

November 2016





CHIEF EDUCATION OFFICE

STEM Education Plan

Driving Individual, Community, and State Prosperity

A LETTER FROM THE GOVERNOR

In 1957, the world was captivated when a tiny Russian orb the size of a beach ball catapulted into outer space for the first time. As Sputnik quietly circled above, a roar grew back home in the United States as everyone from scientists to President Dwight D. Eisenhower called for bolstering American science and technology. In the decades after those appeals, the United States rose to the challenge to produce more highly skilled and trained scientists and engineers to advance our nation.

Beep. Beep. Beep. In many ways, Sputnik's first transmitted sounds triggered the alarm to America to wake up. Today, we are more aware than ever of the importance of quality Science, Technology, Engineering and Mathematics (STEM) education that allows Oregon and our nation to compete on a global level, and to tackle and solve society's most pressing problems. And, if we want a future where each Oregonian thrives, it is incumbent upon us as a community of political leaders, policymakers, educators, school administrators, the business community, and, most importantly, students, to shape the future of our state through educational opportunities that give our young learners the foundations they need to be ready for the jobs of tomorrow.

One of those students I think about is Shayla Edge, whom I met while she was a fifth-grader in Coos Bay. Shayla, a member of the local robotics team, OMG Ort Minimizing Gypsies (ort is another word for food waste), won first place at the Intel Oregon FIRST LEGO League qualifying tournament earlier in 2015. We talked about her career goals (she wanted to become a veterinarian) and her interests in schools (computers, coding, robots, and Legos). She also had some thoughts on how to better engage students, including hopes that businesses and community members assist with hands-on learning by sharing with students what they know.

"I definitely think that they should have more things like robotics – not just after-school things but things you can do during school," Shayla said. "More computer things and being able to use the stuff for yourself, not just having to look at it on a paper and have a teacher say, 'OK, now what's the answer?'"

Expanding STEM education opportunities, along with Career and Technical Education (CTE), will give more Oregon students the chance to participate in applied and engaging learning. My goal is that each Oregon student graduates with a plan for his or her future. STEM and CTE opportunities are important gateways to the world of work beyond high school, proven to keep students on track to graduate. The roar we heard nearly six decades ago to improve and expand science and technology is louder than ever. Let's heed the call and work together to provide more opportunities to our future generations of Oregonians who will one day lead, create, and innovate in our state.

Kate Brown
Oregon Governor

Chief Education Office
775 Court Street NE
Salem, OR 97301
Phone: 503.373.1283
www.education.oregon.gov

STEM EDUCATION PLAN

November 2016

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Executive Summary

CONTEXT

Five years since the introduction of Oregon's first STEM Education Plan, the state has taken important steps toward realizing that plan's vision:

> *Reimagine and transform how we educate learners in order to enhance their life prospects, empower their communities, and build an inclusive, sustainable, innovation-based economy. Oregonians of all races, economic status, and regions will develop the fundamental STEM-enabled skills and mindsets necessary to:*
> - *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*
> - *Fully contribute to an increasingly complex and technologically rich global society*
> - *Address high-demand, competitive workforce and industry needs*

While Oregon has made headway on a number of the goals outlined in the 2016 STEM Education Plan, we have yet to move the needle in a big way statewide.

As communities across Oregon grappled with the effects of the COVID-19 pandemic, the crisis only highlighted the critical need for community-based, collaborative organizations, like Oregon's STEM Hubs, and the type of engaging, hands-on, project-based learning that is at the core of STEM education. As districts, schools, educators, parents, and students adapted to virtual learning, STEM Hubs stepped up. Hubs have developed and shared at-home STEM learning activities, organized virtual field trips, internships, and learning opportunities with local employers, and provided online professional development for educators.

Further, the expected lasting economic impact of COVID-19 means that now, more than ever, young Oregonians need STEM education. The skills and mindsets developed through STEM – problem solving, critical thinking, adaptability, innovation, design thinking, etc. – are exactly those skills that will help our young people thrive in an uncertain economy, and restart Oregon's economic engines.

We believe that now, with Oregon's Regional STEM Hub Network firmly in place and continuing to strengthen and mature, and an expanded STEM Investment Council that includes representatives from education, community-based organizations, and other partner organization, we have the opportunity and capability to accelerate progress. We need a STEM Education Plan to match this new phase.

The 2021 STEM Education Plan maintains and builds off of the grand vision for STEM education set forth in the 2016 plan. The updated plan attempts to operationalize the existing goals and assign clear indicators, performance targets, and roles. This plan is highly ambitious, outlining roughly 40 different strategies to implement in order to achieve our four overarching goals. As such, we have identified 10 priority strategies that will be the main focus for the next biennium. While all outcomes and strategies identified in the 2021 STEM Education Plan are essential, we believe that the following strategies are the most critical in the near-term.

PRIORITY STRATEGIES

Outcome I, Strategy (a): Incorporate applied learning, project-based learning, and other engaging practices into math and science curricula

Lead(s): STEM Hubs, school and district administrators, educators
Support: ODE, non-profits, community-based organizations, employers

Outcome I, Strategy (b): Increase time on science in elementary school

Lead(s): School and district administrators, educators, ODE
Support: STEM Hubs

Outcome II, Strategy (a): Integrate STEM teaching and learning principles across K-12 curricula

Lead(s): STEM Hubs, school and district administrators, educators
Support: ODE, non-profits, community-based organizations employers
Metric:

Outcome III, Strategy (a): Adopt culturally relevant, place-based contexts as the basis for STEM lesson plans, units, and courses

Lead(s): STEM Hubs, school and district administrators, educators
Support: ODE, non-profits, community-based organizations, employers

Outcome IV, Strategy (b): Provide financial aid for postsecondary students from underserved/underrepresented communities pursuing STEM postsecondary education and training pathways

Lead(s): HECC, State Legislature, postsecondary education and training providers
Support: Non-profits, community-based organizations, employers, philanthropy

Outcome IV, Strategy (c): Reform math and science course content, sequencing, and/or tracking

Lead(s): ODE, STEM Hubs
Support: School/district administrators, educators, postsecondary education/training providers

Outcome VI, Strategy (a): Provide STEM-based professional development sessions and communities of practice

Lead(s): STEM Hubs
Support: School and district administrators, regional educator networks

Outcome VII, Strategy (a): Provide high-quality STEM professional development to school and district administrators

Lead(s): STEM Hubs
Support: Regional educator networks

Outcome VIII, Strategy (a): Conduct fundraising outreach to business and philanthropy

Lead(s): STEM Hubs
Support: STEM Investment Council, non-profits, CTE-STEM Employer Coalition

Outcome IX, Strategy (a): Collaborate with CTE, workforce, early learning, and educator network leaders, and others to propose, fund, and implement local and regional initiatives

Lead(s): STEM Hubs, CTE regional coordinators, early learning hubs, regional educator networks, local workforce development boards
Support: STEM Investment Council, HECC, Oregon Workforce Partnership, Workforce and Talent Development Board, Early Learning Council

Oregon's STEM Education Plan

Driving Individual, Community, and State Prosperity

VISION

Reimagine and transform how we educate learners in order to enhance their life prospects, empower their communities, and build an inclusive, sustainable, innovation-based economy. Oregonians of all races, economic status, and regions will develop the fundamental STEM-enabled skills and mindsets necessary to:

- 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
- Fully contribute to an increasingly complex and technologically rich global society
- Address high-demand, competitive workforce and industry needs

We live in a time of exponential change – where we are flooded by information, where new technologies alter nearly every facet of our lives, and where the pace of global developments have an increasing impact on our communities and our planet. In this shifting context Oregon must prepare its learners for a future that we can't even imagine today, to solve problems that we are just beginning to fathom, using technologies that haven't yet been invented. In their various personal and occupational roles Oregonians will be called upon to understand these complex challenges, find solutions, adjust to change, innovate, work together, and build on the knowledge, enterprise, and achievements of previous generations.

Our students' education must enrich their lives, prepare them to successfully adapt to an unforeseeable future, and strengthen the economic prospects of Oregon's communities.

Right now, an economic resurgence infused by emerging technologies and scientific discoveries in every sector of the business landscape offers unprecedented job and career opportunities to Oregonians who've acquired the talent, passion, and initiative that come from studies in science, technology, engineering, and math (STEM). This is evident, as expected, in electronics, software, clean energy, and cutting edge biomedical research. But it's also true in more established sectors such as advanced manufacturing, precision agriculture, construction, and food processing.

In 2013, Oregon companies added more than 220,000 jobs, the majority of them STEM-related. That number is expected to increase in the foreseeable future.[1] In 2015 the state boosted job growth above 3 percent, making it the nation's 8th fastest growing economy.[2] One major driver of this job growth is Oregon's high-technology and software sectors, which pay average wages of $100,000 per year. Additionally, Oregon's small-business innovators and entrepreneurs continue to propel the economies of Portland, Lane County, the North Coast, Central Oregon, the Gorge, Pendleton-Umatilla, and Southern Oregon. The state's wages have rebounded too, and are now growing at nearly 8 percent per year[3]. And, every region of the state is experiencing various degrees of recovery in population growth and economic activity, even though many rural regions are still in distress. Highly skilled and educated newcomers are attracted to the state's quality of life and innovative economy.

THE RELATIONSHIP OF STEM AND CTE

Although STEM and Career Technical Education (CTE) programs have traditionally had different funding sources, delivery structures, and societal expectations, they are highly complementary. They share intended outcomes, applied learning approaches, and the preparation they offer for high-demand careers. (See Venn diagram, Appendix A.) In particular, both CTE and STEM engage and motivate students through hands-on, real-world learning; both hone creativity, critical thinking, problem-solving, communication, and teamwork; and, both prepare students for well-paying careers and successful futures.

Against this backdrop, there is a looming and growing disconnect between the demand for skills and talent in Oregon's economy and the number of young Oregonians emerging from our education system who possess such skills and talent, especially in the STEM disciplines. This disconnect represents a threat to the job prospects of our people, the prosperity of our communities, and the competitive capacity of our economy.

This needn't be so. Each one of Oregon's students has the potential to acquire and apply capabilities in the jobs demanded by a cutting-edge economy. The path to readiness for highly-skilled, high-paying jobs in this evolving economy needs to be extended to more of our students. Important student learning benchmarks bear out the urgent need and opportunity to effectively engage more of our students, especially students from communities of color and families in poverty. In 2015, 37% percent of all fourth graders scored at or above the proficient level for math in the National Assessment of Educational Progress (NAEP) as compared to 27% of our students eligible for lunch subsidy, 19% for our Latino students, and 17% percent for our African American students.[4]

Oregon cannot afford its growing talent shortages. By 2020, our economy will have almost 40,000 new job openings per year in STEM-related fields, and 94 percent of those will require a postsecondary credential.

The demands of Oregon's economy for highly-skilled talent will continue to increase in the future, over and above existing shortages. By 2020, our economy will have almost 40,000 new job openings per year in STEM-related fields, and 94 percent of those will require a postsecondary credential[5]. Today, based on current labor market data, the state's three most in-demand industry clusters are healthcare (with 11,157 job openings), manufacturing (with 6,213 job openings) and information services (with 2,269 job openings). Within these industries, healthcare practitioners (with 3,813 job openings), computers and IT (with 2,171 job openings) and architecture and engineering (with 1,241 job openings) lead the technical and professional occupations.[6]

The bottom line: Oregon's growing economy requires a statewide strategy to prepare individuals for high-wage, high-growth STEM careers. Although there were still more than 117,000 unemployed workers in August 2015,[7] Oregon companies indicated that they cannot find qualified talent. This mismatch of talent and available jobs will only intensify if the skills and preparation gaps are not addressed.

STEM Literacy for All

Let's be clear. The challenge before us is not simply about filling jobs and driving economic growth. More of our students will succeed in school when the connection between their learning and their future is clear and when there is readily-available access to opportunities to become more prepared to adapt and contribute to a rapidly evolving, technologically-rich society. Currently, 26% percent of our students do not graduate high school on time, limiting their future prospects and the opportunity to realize their full potential. STEM education provides a pathway to improve these prospects.

Oregon must act now. And, we must act together. We must strive to help each student discover and develop their talents and interest, achieve individual prosperity, and thrive as a citizen of Oregon and of the world. Each student must be equipped with the cross-cutting skills, attitudes, and dispositions needed to be successful in work, family, and community life. When asked what those skills, attitudes, and dispositions are, educators, parents, and employers have nearly identical responses. They say that what students need goes far beyond specific content knowledge to include critical thinking, problem solving, creativity, communication, flexibility, perseverance, risk-taking, adaptability, teamwork, and initiative.[8] In a society where information and academic content is readily searchable online, those who are able to analyze, synthesize, and apply that information in unique situations are the ones who will be in the highest demand, and will also be the change-makers of our future.

STEM and CTE education are a critical way that Oregon can fully prepare each student for success. These complementary approaches dramatically increase real-world relevance, have authentic demonstrations of student thinking, and provide opportunities for students to take charge of their learning. In STEM and CTE students become more engaged in the learning process. Engaged learners succeed. They are able to see pathways and opportunities before them, and stay on the path to graduate with a plan.

Oregon must 1) double the number of 4th and 8th grade students proficient in math and science by 2025, and 2) double the number of STEM and CTE degrees and certificates by 2025.

The state must continue to transform its student-centered approach to teaching and learning by scaling STEM and CTE education. In its truest form, STEM is a multidisciplinary approach to learning that eliminates the false dichotomies between academic and applied learning, between in-school and out-of-school experiences, and between education and employment. The applied learning approach of STEM and CTE motivates students, ignites their curiosity and creativity, encourages problem solving, and instills strong work habits. STEM education equips Oregon students with the knowledge, skills, creative thinking, and dispositions that will help them thrive in a rapidly changing, technologically rich world.

~~Oregon's Current STEM Ecosystem: Robust STEM Goals, Policies, and Investments~~

~~In 2011, Oregon leaders adopted the bold 40-40-20 goal: By 2025, 100 percent of Oregon's students will graduate from high school, with 40 percent going on to earn a bachelor's degree or higher, and 40 percent holding at an associate's degree or other technical credential.~~

~~STEM education plays an important role in achieving this statewide goal. Using the 40-40-20 goal as a springboard, the Oregon Legislature established the STEM Investment Council to 1) double the number of 4th and 8th grade students proficient in math and science by 2025 and 2) double the number of CTE-STEM degrees and certificates by 2025. The STEM Investment Council is also committed to achieving equity of access, opportunity, and attainment for historically underserved and underrepresented populations.* These two goals were created to increase state productivity, reduce poverty, and meet the talent needs of businesses and communities.~~

~~To reach these goals, Oregon has aggressively invested in STEM policies and initiatives (see Figure 1). These include:~~

- ~~In 2012, adopting College and Career Readiness standards to increase expectations – and the quality of teaching and learning – for Oregon students.~~
- ~~In 2012, creating a statewide network of regional STEM Hubs and forging stronger industry partnerships.~~
- ~~In 2013, establishing the STEM Investment Council.~~
- ~~In 2014, adopting and implementing the Next Generation Science Standards (NGSS), which also integrate engineering standards and practices.~~
- ~~In 2015, creating the Oregon Talent Council to help state agencies and education institutions develop talent to meet the growth and competitive needs of Oregon's traded sector and high-growth industries.~~

* For the purposes of this plan, "historically underserved and underrepresented" populations in STEM include African American, Latino/Hispanic, Native American, Alaskan Native, and Pacific Islander. It also includes both rural and urban students in poverty, as well as women.

OREGON'S REGIONAL STEM HUBS

As a key strategy to accelerate improved outcomes across the state, the Legislature created a statewide network of Regional STEM Hubs. These hubs devise local solutions to local needs. They coordinate regional communication and partnerships, improve key student outcomes, build capacity and sustainability for change, and encourage and support local and statewide engagement.

The Hubs are multi-sector partnerships that link local P-20 educators with representatives from workforce and economic development, community-based organizations, and business to transform STEM teaching and learning. (See STEM hub map, Appendix E.)

~~This coherent set of policies and strategic actions seeks to address the state's full education and workforce continuum.~~

~~In conjunction with its policies and actions, the Legislature has made considerable investments to increase student learning opportunities in CTE and STEM education, to increase degree and certificate production in STEM fields, and to increase participation and degree completion in STEM fields by students of color and women at public colleges and universities. In 2013, in addition to establishing the STEM Investment Council, the Legislature allocated $8.5M to fund six regional STEM Hubs, model STEM Lab Schools, and a suite of STEM/STEAM/CTE grants focused on historically underserved and underrepresented students. In 2015 the Legislature doubled funding for CTE and STEM education, increasing its investment from $17M to nearly $35M, including investments for regional STEM Hubs, STEM innovation grants, CTE revitalization grants, Career Pathways, CTE summer programs, teacher development, and post-secondary support for historically underserved and underrepresented students. It also invested $6.1 million in the Oregon Talent Council to support start-up programs at post-secondary institutions aligned with high-wage, high-growth sectors~~.

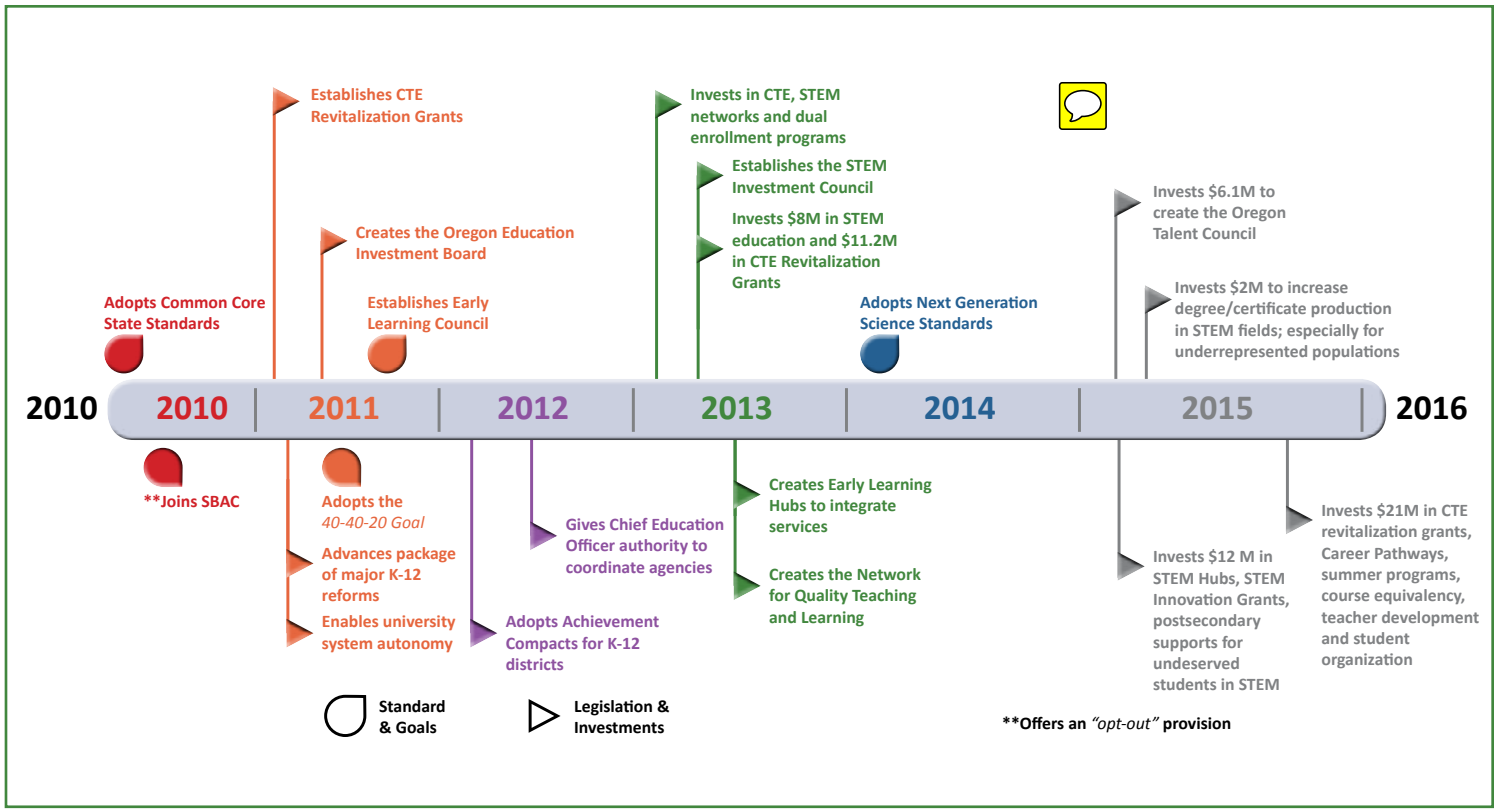

Figure 1: Oregon's STEM policies and investments

~~In 2015 the Oregon Higher Education Coordinating Council (HECC) implemented a new funding model, which incentivizes successful student completion of degrees with special emphasis on historically underserved students and degrees in high-priority fields. The Legislature also invested $10M to create the Oregon Promise, which offsets tuition payments for Oregon's recent high school graduates who attend and pursue a certificate or degree at one of the state 17 community colleges.~~

~~Oregon is on the right track with its robust STEM goals, policies, and investments. But, it will take time for them to bear fruit and impact the state's results indicated in Figure 2, which are currently mediocre at best. Partners must acknowledge that a systemic commitment to STEM and CTE education is a marathon, not a sprint. Investments will likely result in a "hockey stick" growth pattern, where indicators remain flat for four to five years and then increase rapidly as investments start to benefit the first cohorts coming through.~~

System Gaps and Related Results

Major gaps in Oregon's STEM education ecosystem are identified in the top half of Figure 2. The bottom half of the figure pinpoints Oregon's middling STEM results, which correlate with the gaps. Significant gaps affecting students include the amount of time each week that Oregon elementary students spend on science. Currently, the state ranks 50th. In addition, only 13 schools in the state offered AP Computer Science in 2013-14.

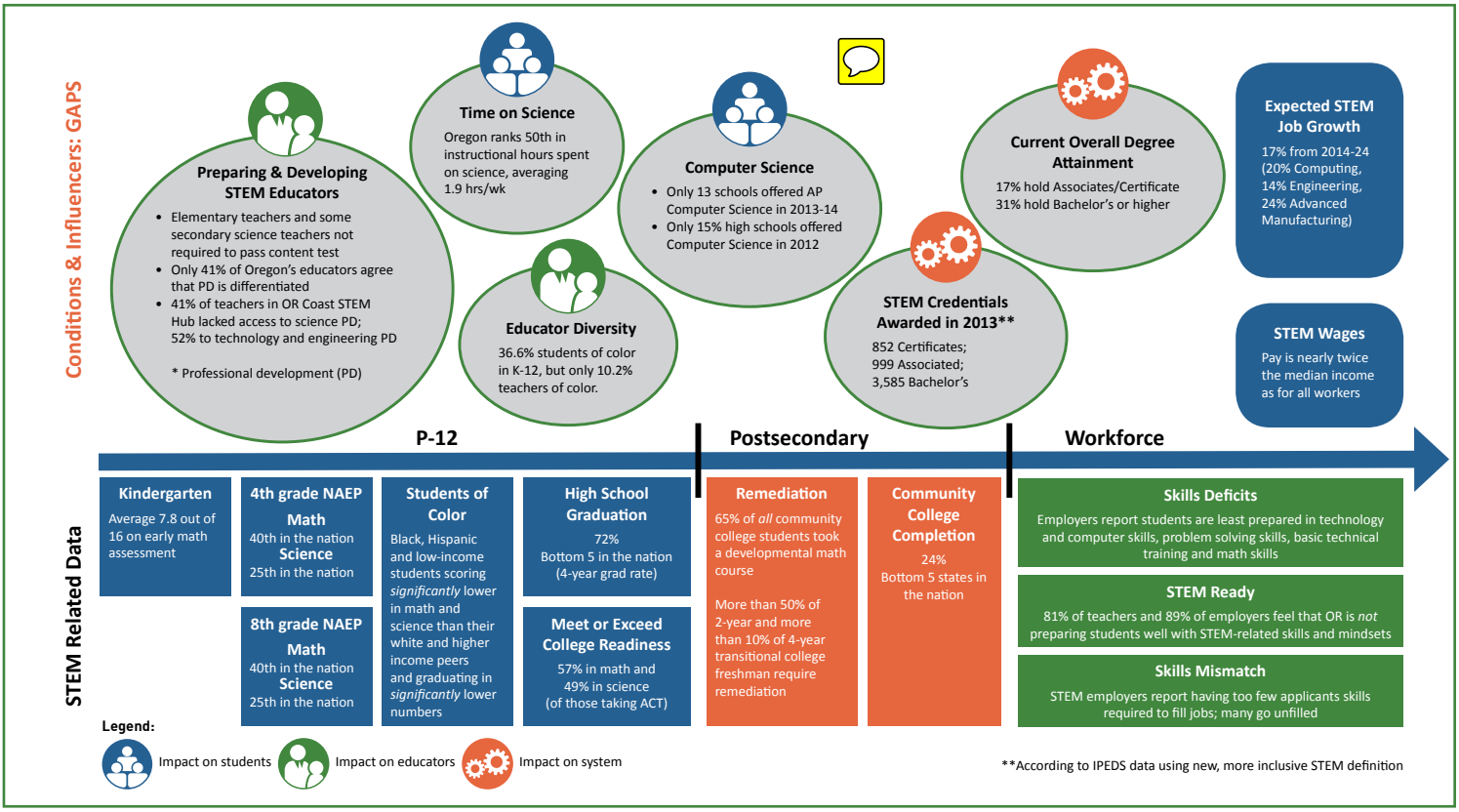

Figure 2: STEM gaps and data

~~National research attributes the lack of diversity in the STEM labor force in part to so few STEM role models of color in education. Gaps that impact educators include Oregon's low expectations for STEM teacher preparation and low quality professional development. Although Oregon places a premium on equity for its students, it has a small share of teachers of color (10.2 percent) relative to students of color (36.6 percent). However, according to the Oregon Educator Equity Report, the state is on track to meet a goal of increasing the number of diverse teachers.~~[9]

~~The state's mediocre STEM outcomes reflect the system gaps cited here. For instance, as shown in Figure 3, only 7 percent of Oregon's class of 2006 (41,655 sophomores in the 2003-04 school year) had achieved a STEM postsecondary credential by the spring of 2013. This example highlights a gap between the state's STEM degree production and STEM jobs that are available in Oregon.~~

~~If Oregon is to reach its laudable statewide 40-40-20 goal and its STEM-specific goals then it must stay the course to advance its previously enacted STEM policies and investments and expand efforts to target and close its gaps.~~

The Oregon STEM Investment Council

Created in 2013, Oregon's STEM Investment Council has a legislative mandate to assist the Chief Education Officer with the development and implementation of a long-term strategy to advance the state's STEM goals. This plan represents the Council's recommended suite of long-term strategies.

To jumpstart its work, the STEM Investment Council convened a statewide STEM Leadership Summit in 2014 to determine systemic STEM barriers across the state's P-20 education and workforce system and identify solutions to remove those barriers. The STEM Investment Council used those findings to inform its recommendations for the Governor's STEM budget for fiscal years 2015-17. Over the last several months, the Council and the Chief Education Office have been working with educators, diverse community groups, non-profits, and other partners to articulate a vision, belief statements, and driving goals for STEM education in Oregon. In particular, this vision emphasizes equity of opportunity, access, and attainment for every Oregon student consistent with Oregon's Equity Lens.

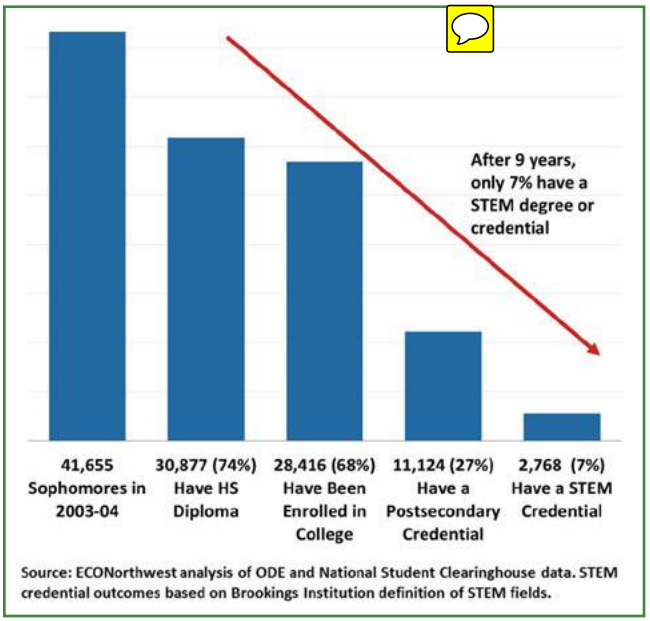

Figure 3: Class of 2006 STEM Outcomes by spring 2013

STEM, STEAM, What does it all mean?

This strategic plan is acronym agnostic. Whether you call it STEM, STEAM, STREAM, STEMM, METS, i-STEM, e-STEM, TEAMS, S^2TEM, $MESH_T$, or other associated acronym, Oregonians generally agree on the fundamental principles and values put forward in the following STEM Manifesto. These guiding belief statements were created by the Council's strategic planning committee as the foundation for this plan, and they strive to communicate a vision of STEM education through which we ignite an inclusive renaissance of curiosity, creativity, wonderment, innovation, and the joyful pursuit of life long learning and talent discovery. In this light STEM can be viewed as "applied curiosity"—the insatiable desire to know and wonder, coupled with a creative drive to make, invent, and contribute to the betterment of humanity.

The STEM Manifesto

1) **All people have creative potential.** Our students are not passive consumers of information. Adults must provide the space for them to be active participants in their own learning and construction of knowledge. Their inherent talents, interests, and creativity have only to be unleashed.

2) **Each student deserves an opportunity to prosper.** Too many students who reflect the racial and ethnic diversity of Oregon, too many from families navigating poverty, too many from rural communities, and too many young women are not afforded a path into high-wage, high-demand STEM professions. No student's potential, nor dreams, should be left unrealized.

3) **Diversity is our strength.** Differences of gender, ability, race, ethnicity, and culture provide critical and diverse perspectives and voices to address today's complex challenges. Innovation and solutions emerge 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, take ownership of, and joy in their learning, and become lifelong learners.

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. We need to engage with leaders, institutions, and volunteers in our communities who want to help our young succeed.

6) **Innovation is the cornerstone of prosperity.** STEM education is not just about filling jobs, but also about creating jobs. Building an innovation-based economy is essential for the long-term competitiveness and prosperity of Oregon and its people.

7) **Learning takes courage, persistence, and humility.** Pushing the boundaries of one's understanding requires us to value curiosity, risk failure as a stepping stone to success, prize questions over answers, and see learning as an unending journey.

8) **STEM skills are essential skills.** Advancements in science, technology, engineering, and mathematics are transforming nearly every facet of life and work. Not only is STEM literacy integral to the requirements of daily life, civic engagement, and employment, so are STEM capabilities in analyzing needs, taking initiative, organizing effort, and solving problems.

9) **STEM learning is cross-disciplinary.** It is the interconnectedness of ideas that enables people to integrate new learning with their prior experiences. STEM by its nature synthesizes analytical and creative thinking across multiple areas of human knowledge and expression. It is a powerful tool that sits at the crossroads of the sciences, arts, and humanities.

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

STEM VISION FOR OREGON

Reimagine and transform how we educate learners in order to enhance their life prospects, empower their communities, and build an inclusive, sustainable, innovation-based economy. Oregonians of all races, economic status, and locations will develop the fundamental STEM-enabled skills and mindsets necessary to:

- 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
- Fully contribute to an increasingly complex and technologically rich global society
- Address high-demand, competitive workforce and industry needs

Oregon's STEM Goals

Summarized below are four primary goals to spur interest, attainment, and opportunities for learners through STEM education. Each of these is detailed more fully in terms of measurable priority outcomes, a narrative rationale for each area of focus, and a summary of initiatives, if implemented, will achieve the targeted outcomes.

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 every student to become a part of an inclusive innovation economy.

3) Continuously improve the effectiveness, support, and the number of formal and informal P-20 STEM educators.

4) Create sustainable and supportive conditions to achieve STEM outcomes aligned to Oregon's economic, education, and community 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.

OUTCOME I
Oregon students are interested in STEM and develop a STEM identity.

Developing a STEM identity is critical to students' future interest in, pursuit of, and success in STEM learning and careers. Through discovery, discourse, inquiry, and play, children learn to observe natural phenomena, become pattern sleuths, shape and defend an argument, and use problem-solving tactics.[i]

Making a Lasting Impression
According to the Center for Advancement of Informal Science Education, students who develop STEM identities show a deeper interest in these subjects. In fact, "science identity, for example, increases the likelihood that students will, over the long term, continue to develop science literacy or even follow an educational pathway toward a science career or profession that requires or benefits from education or training in STEM."[ii]

Importantly, this STEM identity development must begin at a young age. Early STEM experiences are vital because students get hooked on STEM early. Research suggests that students who decide to take advanced science classes and pursue postsecondary STEM fields tend to get interested in STEM and make their choices as early as middle school, or even before.[iii] For girls and culturally and linguistically diverse students, early exposure to STEM experiences proves to be a key factor in deciding to pursue STEM coursework and careers.[iv]

Improving Outcomes
Further, a random assignment study by the Center for Research in Educational Policy supports the claim that strong inquiry-based science experiences strengthen K-8 science outcomes, even for students who are typically underrepresented in the STEM fields.[v] A landmark 2007 study also showed that early math skills are one of the best predictors of later academic success in both math and language arts.[vi]

Providing students with project-based, hands-on, and career-influencing science experiences takes teacher expertise, resources, and time. Oregon must ensure that all of its students receive strong STEM education early so they are prepared for college, career, and life.

Strategies

a. Incorporate applied learning, project-based learning, and other engaging practices into math and science curricula
b. Increase time on science in elementary school
c. Provide community-based resources, such as community STEM events, maker spaces, and take-home STEM kits
d. Provide access to out-of-school STEM learning opportunities
e. Offer opportunities for P-12 students to interact with STEM professionals
f. Offer STEM-based work experiences for high school students

Indicators, Performance Targets, and Methods

Indicator 1: Difference in student STEM identity before and after participation in Hub-supported STEM experience*
Target 1: P-12 STEM identity increases by X percent
Method 1: Pre- and post-surveys for students in Hub-supported STEM learning

Indicator 2: Enrollment in high school STEM electives and/or accelerated learning courses
Target 2: Increase enrollment in high school STEM electives by X
Method 2: ODE course enrollment data (might only be for CTE courses)

Indicator 3: Enrollment in postsecondary STEM education and training programs
Target 3: Increase enrollment in postsecondary STEM education and training programs by X
Method 3: HECC enrollment data

OUTCOME II

Students are prepared to enter and succeed in postsecondary STEM education and training pathways or STEM careers.

To meet Oregon employers' demand for a STEM-educated workforce, our students, upon completing high school, must be prepared to enter and succeed in STEM postsecondary education and training pathways or STEM careers.

Math and Science Standards
Most postsecondary STEM education and training pathways and STEM fields require students and prospective employees to meet a certain level of proficiency in math and science. Too often, students complete high school and, due to insufficient K-12 math and science courses, are unable to enter directly into their preferred STEM education and training pathways or job. That is why it is so important to use STEM teaching and learning principles to implement math and science standards that align with postsecondary education and training, as well as employer needs.

In 2014, Oregon adopted the Next Generation Science Standards (NGSS). NGSS introduced an integrated approach to learning science that promotes inquiry and exploration, and deemphasizes memorization and siloed thinking. While still in progress, the Oregon Department of Education is leading the Oregon Mathways initiative, which includes a major revision of Oregon's Math Standards.

Computer Science Education
Some of state's fastest growing job clusters are in technology and software. Currently, Oregon has 8,058 open computing jobs, with average salaries of $81,000 – significantly higher than the average salary in the state. In 2013, Oregon had only 355 computer science graduates (and only 11 percent of those were female). In 2015, Oregon had 290 high school students take the AP Computer Science exam. Of those students, 18 percent were female, 11 students were Latino, and four students were African American. Only 15 percent of Oregon's high schools offered at least one coding course in 2012.16 Only 13 schools offered the AP Computer Science in 2013-14.

Strategies

a. Integrate STEM teaching and learning principles across K-12 curricula
b. Provide access to college-level STEM courses and STEM-related CTE courses and programs of study in high school
c. Develop and implement a statewide plan to provide all students with digital literacy and computer science education

Indicators, Performance Targets, and Methods

Indicator 4: Number and percent of students scoring proficient or better on statewide math and science assessments
Target 4: Increase number and percent of students scoring proficient or better on statewide math and science assessments by X
Method 4: ODE data

Indicator 5: Number and % of students meeting benchmarks on AP science and math exams and on science and math sections of college entrance exams
Target 5: Increase number and % of students meeting benchmarks on AP Science and math exams and on science and math sections of college entrance exams by X
Method 5: National data

Indicator 6: Completion of postsecondary STEM education and training credentials
Target 6: Increase number of postsecondary STEM education and training credentials earned by X
Method 6: HECC data

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

Why a specific goal on equity?
Oregon faces significant opportunity and attainment gaps across its cradle to career education ecosystem, particularly among its students of color and students from families in poverty. The state must close these gaps.

Increasing diversity in the STEM labor force is both a moral and economic imperative. As indicated in the STEM Manifesto, diversity is an asset in addressing today's complex challenges. Yet persons of color and women account for far fewer of the country's STEM job holders than their percentage of the general population. Nationally, just 2.7 percent of African Americans, 3.3 percent of Native Americans and Alaska Natives and 2.2 percent of Hispanics and Latinos who are 24 years old have earned a first university degree in natural sciences or engineering.[vii]

OUTCOME III
Students from underserved/underrepresented communities see futures in STEM

Students from underserved/underrepresented communities face an expectation gap, an

opportunity gap, an information gap, and an inspiration gap. Key systemic inequities include insufficient access to school programs such as computer science, AP courses, and CTE in and out of classrooms; limited student exposure to diverse STEM faculty and out-of-school role models; and biased messaging and expectations. Students from rural areas and families in poverty also often experience limited access to STEM opportunities. Over 38 percent of Oregon's school districts are classified as rural.

Strategies

a. Adopt culturally relevant, place-based contexts as the basis for STEM lesson plans, units, and courses
b. Diversify the STEM teaching workforce
c. Increase access to out-of-school STEM learning opportunities for students from underserved and underrepresented communities
d. Improve the clarity of and access to up-to-date information and data on STEM education pathways and careers

Indicators, Performance Targets, and Methods

Indicator 7: Gaps in STEM identity across different student populations
Target 7: Decrease gaps in STEM identify across different student populations by X
Method 7: Pre- and post-surveys for students in Hub-supported STEM learning

Indicator 8: Gaps across student populations in enrollment in high school STEM electives and/or accelerated learning courses
Target 8: Reduce gaps across student populations in enrollment in high school STEM electives by X
Method 8: Oregon Department of Education course enrollment data

Indicator 9: Gaps across student populations in enrollment in postsecondary STEM education and training programs
Target 9: Reduce gaps across student populations in enrollment in postsecondary STEM education and training programs by X
Method 9: HECC enrollment data

OUTCOME IV

Students from underserved/underrepresented communities pursue and succeed in postsecondary STEM education and training, and/or STEM careers.

Closing achievement gaps

Targeted strategies and supports increase the likelihood of success for students historically underrepresented in STEM studies. At the postsecondary level, those STEM-specific strategies include exposure to STEM courses in conjunction with a combination of advising, co-requisite remediation and gateway-course redesign. To persist to a STEM certificate or degree, students must see how their coursework applies to the real world. Research shows that one of the most effective strategies is access to undergraduate research and/or internships during the freshman

and sophomore years of postsecondary. To help bridge this gap, postsecondary institutions must forge authentic partnerships with business and industry. Employers can influence programs and curriculum, provide technology and equipment or participate on advisory boards.

Strategies

a. Provide non-financial supports, such as counseling and mentoring, for postsecondary students from underserved/underrepresented communities intending to pursue STEM education and careers
b. Provide financial aid for postsecondary students from underserved/underrepresented communities pursuing STEM postsecondary education and training pathways
c. Reform math and science course content, sequencing, and/or tracking
d. Expand and strengthen alumni and professional networks for students of color and women
e. Require that all STEM funding go to activities that serve a significant number of students from underserved/underrepresented communities.

Indicators, Performance Targets, and Methods

Indicator 10: Gaps across student populations scoring proficient or better on statewide math and science assessments
Target 10: Decrease gaps across student populations scoring proficient or better on statewide math and science assessments by X
Method 10: ODE data

Indicator 11: Gaps across student populations in meeting benchmarks on AP science and math exams and on science and math sections of college entrance exams
Target 11: Decrease gaps across student populations in meeting benchmarks on AP Science and math exams and on science and math sections of college entrance exams by X
Method 11: National data

Metric 12: Gaps across student populations for completion of postsecondary STEM education and training credentials
Target 12: Decrease gaps across student populations for completion of STEM education and training credentials earned by X
Method 12: HECC data

Goal 3: Continuously improve the effectiveness, support, and number of formal and informal P-20 STEM educators.

Educators have the greatest impact on student success across the education continuum, both inside and outside of classrooms. In Preschool to grade 12 (P-12), for instance, research indicates that a classroom teacher's effectiveness is more important—and has more impact on student achievement—than any other factor controlled by school systems, including class size or the school a student attends.

OUTCOME V

New educators enter the teaching workforce with a deep understanding of STEM teaching and learning principles, and STEM content knowledge.

Thoughtful, skillful teachers who have an understanding of how STEM knowledge and skills are applied in the workplace are the backbone to delivering innovative STEM instruction across elementary and secondary classrooms. They drive differentiated, integrated STEM learning experiences, and develop and deliver hands-on, project-based instruction for learners of all ages.

Strategies

a. Increase the time spent on STEM practices and content in educator preparation programs
b. Increase STEM-focused tracks in educator preparation programs
c. Include educator preparation faculty in STEM educator communities of practice
d. Develop expedited pathways for STEM professionals to become educators
e. Incentivize practicum hours to be earned in STEM classrooms

Indicators, Performance Targets, and Methods

Indicator 13: Number and % of educators who completed a STEM track or have a STEM certification
Target 13: Increase number and % of educators who completed a STEM track or have a STEM certification by X
Method 13: *TBD*

Indicator 14: Number and % of first-year educators who report feeling confident implementing STEM pedagogy
Target 14: Increase Number and % of first-year educators who report feeling confident implementing STEM pedagogy by X
Method 14: *TBD*

OUTCOME VI

The P-12 educator workforce maintains a deep understanding of STEM teaching and learning principles, and is confident in implementing these principles in their practice.

Researchers agree that strengthening educator effectiveness is the most efficient way to boost academic achievement and they believe rigorous, cutting-edge professional development can play a key role in improving educator practices.[viii] This type of professional learning is job-embedded (integrated into the work teachers do on a day-to-day basis), collaborative, incorporates coaching and technology, and takes into account the school context.[ix] However, today only 51 percent of Oregon's educators agree that professional development is differentiated to meet their individual needs.[x] In addition, access to high-level professional development is often lacking across the state.

Strategies

a. Provide STEM-based professional development sessions and communities of practice
b. Provide industry-based experiences for STEM educators
c. Cultivate a community of STEM teacher leaders
d. Create an online repository of STEM instructional resources
e. Create STEM lending libraries for educators

Indicators, Performance Targets, and Methods

Indicator 15: Difference in reported confidence in STEM between pre- and post-surveys for Hub-supported professional development
Target 15: Increase educator confidence in STEM by X
Method 15: Hub administered and collected surveys

OUTCOME VII
School and district leaders adopt STEM teaching and learning principles school- and district-wide

Leaders determine the culture of their organizations and institutions. The same research that has shown that teachers have the greatest impact on student success in the system, also shows that building principals have the next greatest impact. In schools where high quality STEM is taking place, principals and teacher leaders have worked together to create a positive, student-centered culture where educators work collaboratively and are encouraged to take thoughtful risks in their teaching approaches in order to meaningfully engage students and community members.

Many of Oregon's administrators and classroom educators already understand and embrace the power of STEM education and have created pockets of STEM excellence in their classrooms and schools. To ensure that these efforts reach beyond one administrator or educator – beyond a single classroom or one employee's tenure at the school – cultivating a school-wide STEM culture is necessary.

Strategies

a. Provide high-quality STEM professional development to school and district administrators
b. Develop a community of STEM administrator leaders
c. Develop and implement a school-wide STEM transformation process
d. Celebrate and share-out best practices and success stories

Indicators, Performance Targets, and Methods

Indicator 16: Difference in attitude toward STEM between pre- and post-surveys for Hub-supported professional development
Target 16: Increase administrator positivity toward STEM by X
Method 16: Hub administered and collected surveys

Indicator 17: Number of schools recognized as "STEM Schools" by STEM Hub Network
Target 17: Increase the number of schools recognized as "STEM Schools" by X
Method 17: Hub collected data

GOAL 4: Develop a sustainable funding and policy environment for STEM and CTE that provides reliable, seamless, and sufficient support across biennia

Oregon must continue to stay the course and build upon the good work it has done since 2011. To do so, Oregon must make stable, sustained investments in STEM education and adopt policies that align STEM and other related efforts.

OUTCOME VIII
School-, district-, and state-level decision-makers understand, support, and invest in STEM

To ensure continued investment in STEM education, Oregon's leaders, including its education leaders, and the general public must understand and believe in the value of STEM education. Without this buy-in, the multitude of other priorities – education-related and others – will overshadow our STEM efforts. As such, our leaders need to see – firsthand and through data – the positive impacts of STEM education.

Strategies

a. Conduct fundraising outreach to business and philanthropy
b. Develop and implement a STEM communications campaign, including a public-facing STEM data dashboard
c. Meet with school, district, and state leaders about STEM and bring them to community STEM events

Indicators, Performance Targets, and Methods

Metric 18: Level of state funding for STEM Hubs
Target 18: Increase state funding for STEM Hubs by X
Method 18: HECC and ODE legislatively adopted budgets

Metric 19: Amount of funds raised by STEM Hubs
Target 19: Increase amount of funds raised by STEM Hubs by X
Method 19: STEM Hub-reported

OUTCOME IX
STEM-specific initiatives, policy, and funding are aligned and coordinated with related efforts

STEM education does not happen in a vacuum. Rather, it is closely related to – and should be strongly aligned with – other initiatives, such as career and technical education, early learning, educator professional development efforts, education accountability systems, and others.

Strategies

a. Collaborate with CTE, workforce, early learning, and educator network leaders, and others to propose, fund, and implement local and regional initiatives
b. Advocate for STEM to be a required or incentivized activity under current and future P-20 funding streams
c. Strengthen STEM's inclusion in Oregon's federally required Every Student Succeeds Act state plan

Indicators, Performance Targets, and Methods

Metric 18: Level of state funding for STEM Hubs
Target 18: Increase state funding for STEM Hubs by X
Method 18: HECC and ODE legislatively adopted budgets

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[i] TIES STEM Education Monograph Series: Attributes of STEM Education; Aug 2006
[ii] https://www.informalscience.org/sites/default/files/identity-in-STEM-interview-reflections-v2.pdf
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[iv] Generation STEM: What Girls Say About Science, Technology, Engineering and Math; 2012; https://www.girlscouts.org/research/pdf/generation_stem_full_report.pdf
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[vii] National Science Foundation, Women, Minorities, and Persons with Disabilities in Science and Engineering
[viii] Nurturing Quality Teachers in Oregon, A Profile of Success and Challenges of Six Oregon Districts; ECONorthwest, 2008
[ix] Education First: Common Core State Standards & the Transformation of Professional Development; http://www.education-first.com/files/CCSS_PD_Brief_1_-_Essential_Elements_of_PD.pdf
[x] 2014 TELL Oregon Survey, Spring 2014

Summary

This strategic plan consists of a comprehensive set of strategies and initiatives to strengthen and transform the STEM education ecosystem in Oregon. It is formally submitted to the Chief Education Officer as partial fulfillment of the statutory duties of the STEM Investment Council. Through the duties of that Office, these recommendations are also made by extension to the Governor, the State Board of Education, the Higher Education Coordinating Commission, the Early Learning Council, the Youth Development Council, and the Teacher Standards and Practices Commission.

Consistent with this plan the STEM Council will continue to monitor the impact of specific investments as well as changes reflected in the indicators identified in Appendix B. This plan will be updated every two years following a thorough assessment of the changing operating environment in Oregon and input from a broad representation of stakeholders. Each biennium, the STEM Investment Council will provide a report to the Legislature on progress against these indicators, as well as specific policy and investment recommendations arising from the vision and priorities of this plan.

The Oregon STEM Investment Council also thanks the Oregon Community Foundation for generously supporting the development of this plan, Oregon Learns and Education First for collaboration on this work, and to all of the participants of focus groups from communities throughout this great state.

Respectfully submitted,

Jim Piro
Chair, STEM Investment Council

OREGON STEM INVESTMENT COUNCIL

Jim Piro, Portland General Electric (Council Chair)

Celeste Edman, Lunar Logic

Romanna Flores, Intel Corp.

Herb Fricke, Akana

Lisa Graham, Alkemy Innovation

Dwayne Johnson, ScaleUp Partners

Eric Meslow, Timbercon, Inc.

Thompson Morrison, Innovate Oregon

CHIEF EDUCATION OFFICE

Lindsey Capps, Chief Education Officer

Mark Lewis, STEM & CTE Policy Director

Krissi Hewitt, Regional Education Partnership Policy Advisor

ADVISORS

Jim Fong, Rogue Workforce Partnership

Kristen Harrison, Portland Metro STEM Partnership

Bradford Hill, Southridge High School, Beaverton School District

Jessica Howard, Portland Community College, SE Campus

Kimberly Howard, Portland General Electric

Jill Hubbard, Tigard-Tualatin School District

Craig Hudson, Garmin AT

Leslie Garcia, Oregon Health Sciences University

Kali Ladd, Kairos PDX

Andrew McGough, Worksystems Inc.

Kyle Ritchey-Noll, Oregon Business Council

Terrell Smith, Oregon Computer Science Teachers Association

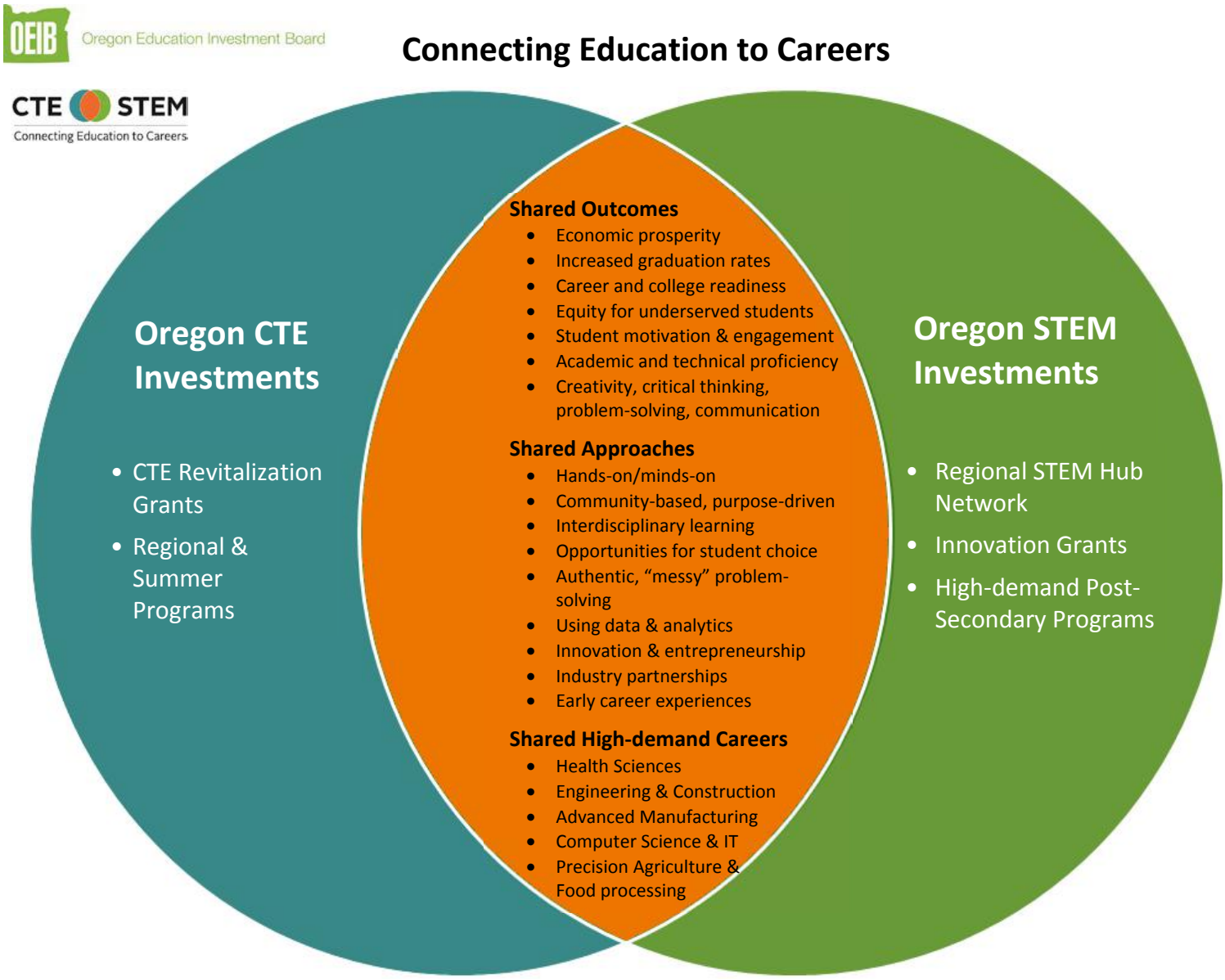
Martin Storksdieck, Center for Research on Lifelong STEM Learning, Oregon State University

John Tapogna, ECONorthwest

Tom Thompson, Oregon Department of Education

Beth Unverzagt, Oregon Afterschool for Kids

APPENDIX A: RELATIONSHIP OF CTE AND STEM



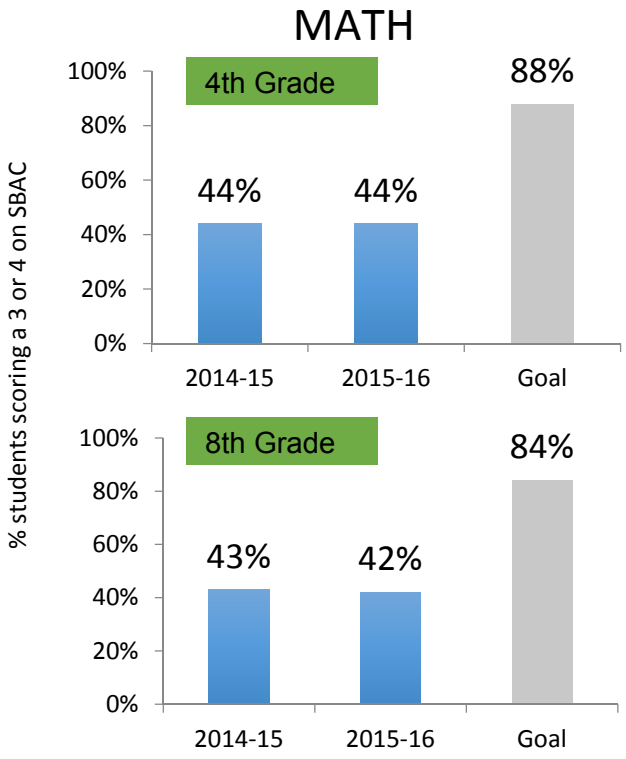
APPENDIX C: BASELINE DATA

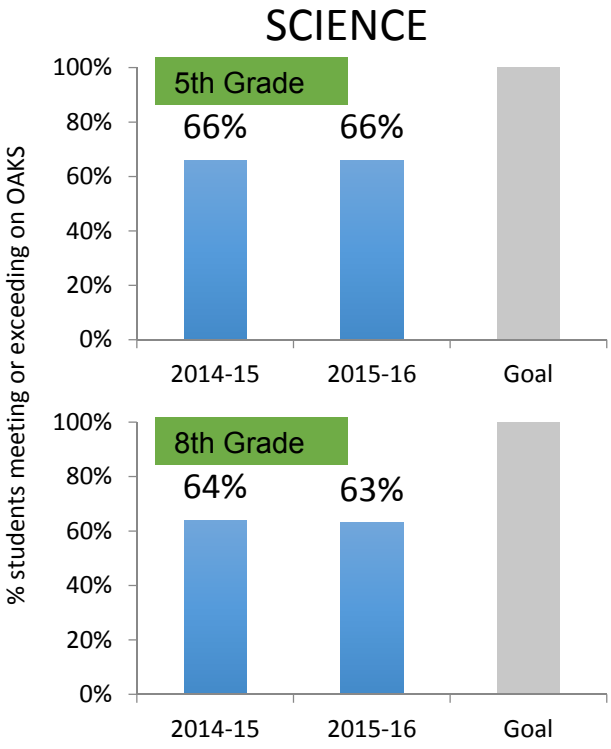
Goal 1

Double the percentage of students in 4th and 8th grade who are proficient in Math and Science.

Notes

In Math, the Smarter Balanced Assessment (SBAC) is administered at 4th and 8th grade. This assessment is aligned to Common Core State Standards with a score of 3 or 4 indicating students on-track for college. In Science, the OAKS is administered at 5th and 8th grades. This assessment is aligned to Oregon state standards that are in the process of conversion to the Next Generation Science Standards.



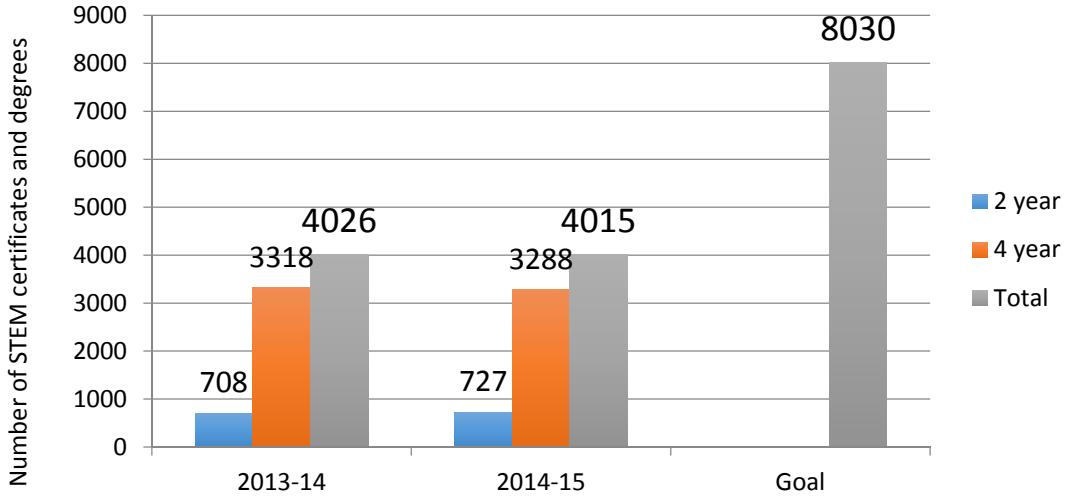


Goal 2

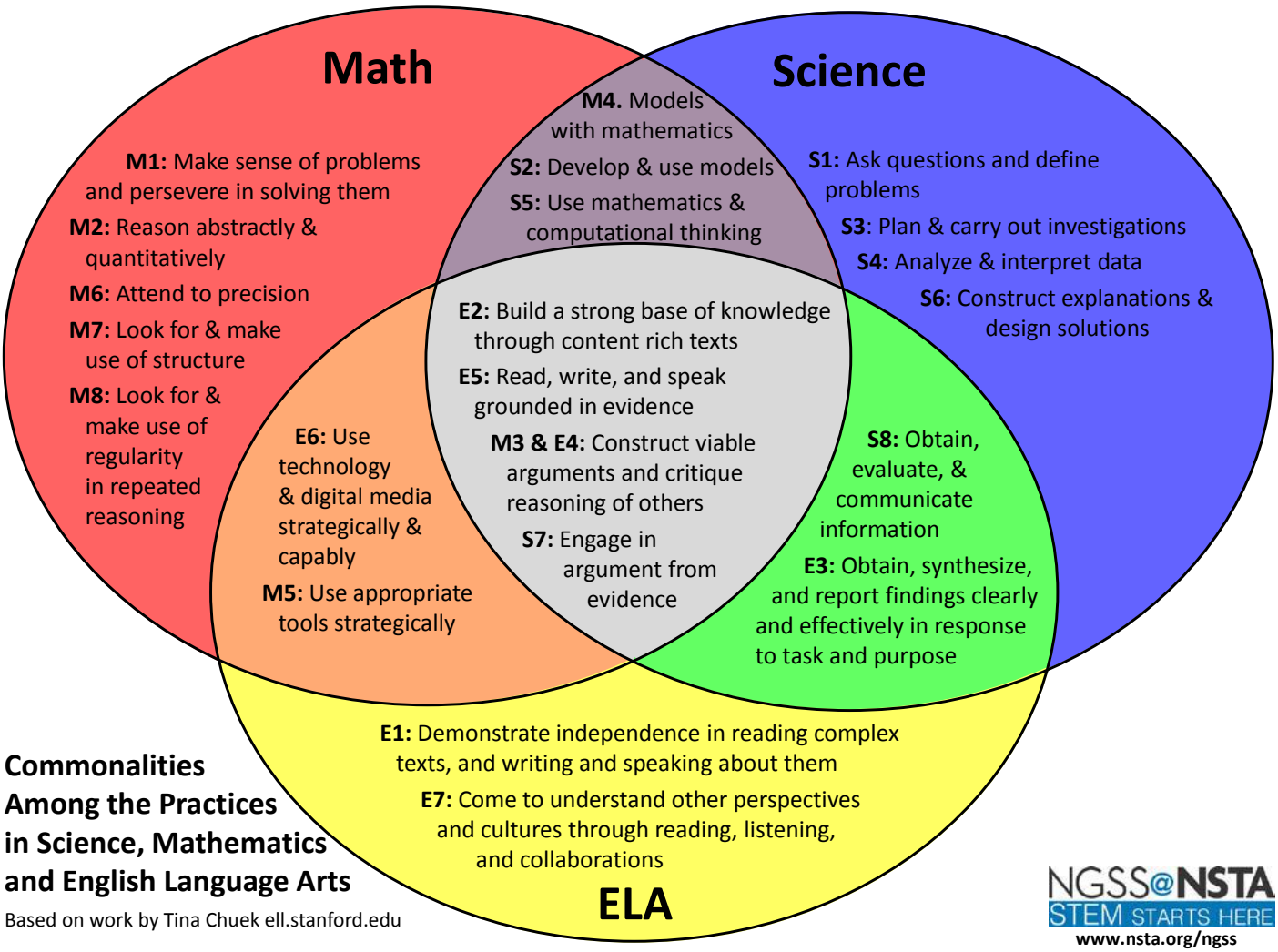
Double the number of students who earn a post-secondary degree requiring proficiency in science, technology, engineering or mathematics.

Notes

Post-secondary STEM degrees were counted using methodology from the Brookings Institute (Rothwell, Jonathan and Kulkarni, Siddharth, Beyond College Rankings A Value-Added Approach to Assessing Two- and Four-Year Schools, pp. 26-28, Brookings, April 2015). Students are defined as those who ever attended an Oregon public K-12 school and then earned a 2- or 4-year certificate or degree in an Oregon public institution of higher education.



APPENDIX D: COMMONALTIES IN THE PRACTICES ACROSS MATH, SCIENCE, AND LANGUAGE ARTS STANDARDS

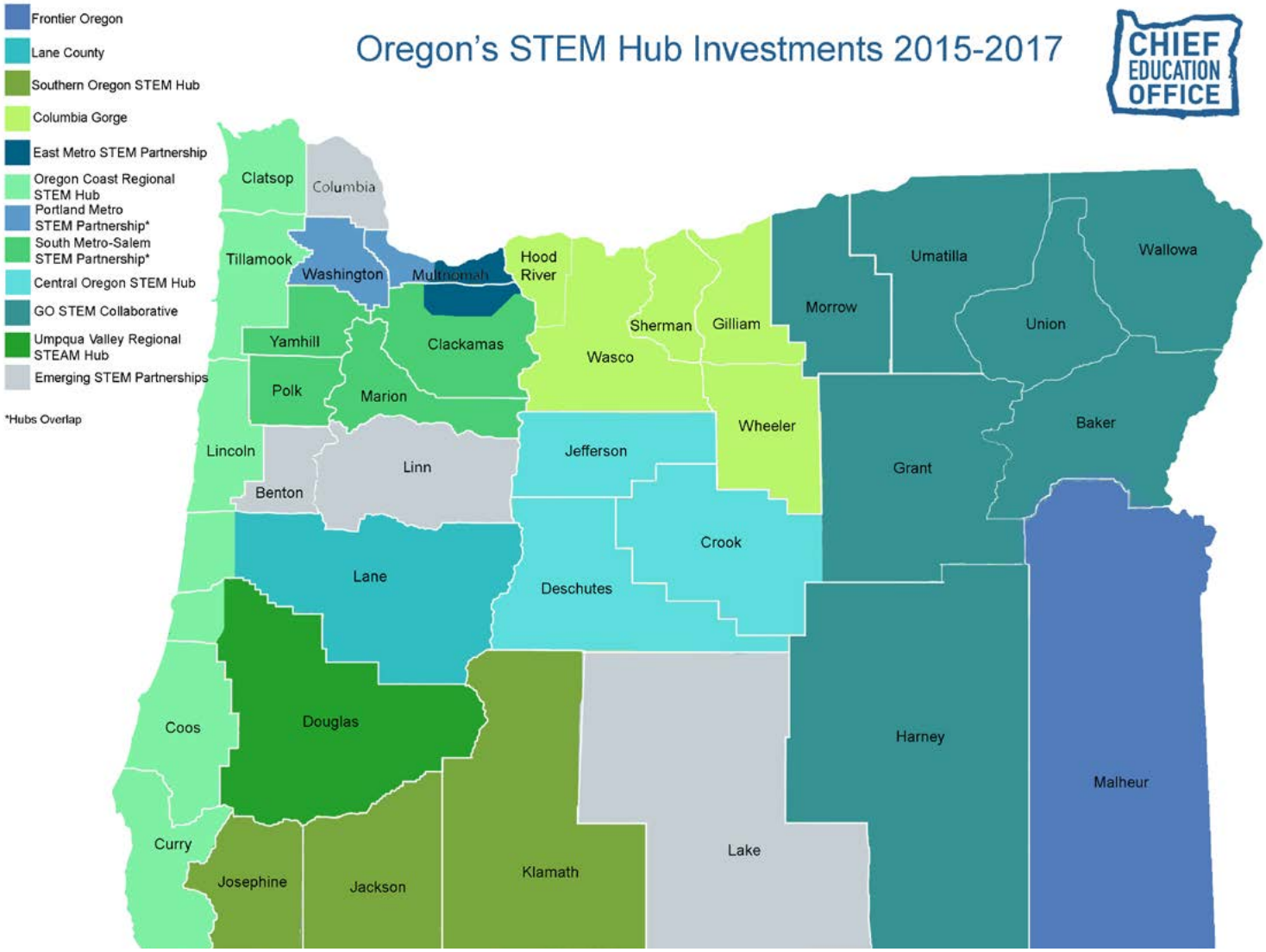


Commonalities Among the Practices in Science, Mathematics and English Language Arts

Based on work by Tina Chuek ell.stanford.edu

NGSS@NSTA STEM STARTS HERE
www.nsta.org/ngss

APPENDIX E: OREGON'S STEM HUBS 2015-17



APPENDIX F: IMPLEMENTING THE PLAN — PROPOSED ACTIONS

The following recommendations are summarized from several different regional community forums, focus groups with communities of color, input from Regional STEM Hub partners, leaders from K-12 school districts, and business partners. They represent specific suggestions for ways that constituents, agencies, and other stakeholders can support the operationalization of this plan. It should be noted that many of these recommendations are already in the process of being implemented by agencies, individuals, and partner initiatives.

K-12 Classroom Educators:

- Elementary school educators should increase the time on inquiry-based science instruction consistent with the NGSS, and integrating science with other subject areas whenever appropriate.
- Use project-based approaches to situate content within the context of "driving questions" arising from the real world.
- Value and reinforce sense-making, reasoning, curiosity, connections, and application over getting "the right answer."
- Reduce the consequences of "failing" and build in opportunities for students to "iterate" and improve their understanding.
- Eliminate or reduce timed testing in mathematics, even for fluency of math facts. Place emphasis on applied, contextual math, and multiple strategies for problem-solving.
- Visit local STEM businesses and organizations to understand STEM careers and how content is applied in authentic settings.
- Prioritize questions and sense-making over getting to "the answer.
- Encourage connections to other discipline areas as much as possible.
- Take learning into the community and bring the community into the classroom through local examples, issues, and volunteers.
- Foster individual student talent and curiosity. Find out what "lights them up."
- Partner with volunteers who are STEM employees both in and out of the classroom.
- Invite diverse role models into your classroom.
- Avoid perpetuating STEM stereotypes and negative feelings, especially about math.
- Collaborate with peers from other subject areas and/or grade levels.
- Feed your own curiosity and remain playful.

K-12 Administrators:

- Prioritize STEM skills and dispositions as fundamental skills and not just "add on" or "enrichment."
- Ensure 3-4 hours of inquiry-based science per week in ALL elementary classrooms year round, integrating with other subject areas wherever possible.
- Partner with community-based after school and summer STEM programs, and allow them to use district facilities.
- Create school and district cultures that support risk-taking and (sometimes messy) applied learning approaches.
- Encourage more teachers to partner with STEM professionals and incorporate this into their professional development.

- Engage in regional collaborations, such as STEM Hubs or Regional Achievement Collaboratives, with other community leaders.
- Ensure students of color, students in poverty, and girls have equitable participation in STEM-related activities and programs.
- Expose students, teachers, counselors, principals, and other faculty to local STEM businesses and organizations.
- Reach out to parents, explaining to them how STEM-related careers could be a benefit to their kids.
- Prioritize CTE programs that are aligned to high-wage, high-demand areas such as biomedical sciences, manufacturing and engineering, and computer science.
- Engage with local and regional policy makers and encourage them to visit your STEM and CTE programs.

Post-secondary Faculty:

- Increase mentoring, internships, and undergraduate research opportunities in STEM for students of color, women, and students in poverty.
- Incorporate experiential learning, collaboration, and "flipped" classroom approaches.
- Foster a culture based on student success, not "weeding out."
- Ensure content is situated within rich contexts and arises from fundamental questions and phenomena.
- Provide opportunities to experience STEM in industry and research, within educator prep programs.
- Work more closely with K-12 to design and implement quality practicums that provide teacher candidates with opportunities to learn from exceptional STEM educators.

Out of school STEM program providers:

- Increase marketing and program outreach to communities and students of color.
- Continue to focus on experiential and playful learning that fosters curiosity, creativity, problem-solving, critical thinking, and develops positive STEM identities.
- Incorporate STEM content and practices consistent with the Common Core Math and Next Generation Science Standards.
- Collaborate with schools and formal educators to reinforce learning in and out of school.
- Implement the State's "common measures" STEM instruments to assess impact on participants.
- Contribute event information to a statewide database of community-based STEM programs.
- Cooperate with statewide data collection and assessment efforts.
- Utilize the Youth Program Quality Assessment or other research-based instrument to guide continual improvement.
- Connect program activities to potential career exploration.

Policy Makers and elected officials:

- Dedicate adequate and sustainable funding for transforming STEM and CTE educational outcomes. Provide sufficient time for initiatives to have impact.
- Elevate the importance of quality science learning and instruction alongside reading, mathematics, and CTE.
- Provide ongoing funding for afterschool STEM programs and intermediary organizations, especially for those students historically underserved and underrepresented in STEM fields.
- Provide financial incentives for more STEM teachers of color, career-changers, and those working in hard to fill regions.
- Ensure broader representation of diverse stakeholders in decision-making.
- Continue to provide scholarships for post-secondary studies, especially targeting high-wage, high-demand STEM fields.

Business and Industry:

- Incentivize (pay) STEM employees—especially those of color—to volunteer with education programs both in, and out of, school.
- Join other business leaders to advocate for increased legislative, county, and city support for STEM and CTE programs.
- Partner with local schools to provide student (paid) and teacher internships, job shadows, and tours within STEM and CTE companies.
- Participate in Regional STEM Hub efforts to transform education and meet workforce needs.
- Invest in both local and statewide STEM programs.
- Prioritize diversity in recruiting and hiring diverse STEM employees, and in selecting interns.
- Partner with the State Chamber of Commerce to develop promotional materials, showcasing opportunities for Oregon's innovation economy.

State Agencies

All/Other:

- Modernize Oregon's Career Information System to be more accessible to students and parents, with real-time market data on jobs and salaries.
- Address unique issues in rural communities related to funding, professional learning structures, educator workforce incentives, etc.
- Ensure representation of diverse stakeholders during STEM and CTE policy-making discussions.
- Increase recruitment and promotion of the STEM and CTE teaching profession.

Chief Education Office:

- Continue to work with communities of color and communities in poverty to champion issues around equity of access and opportunity.
- Work to bring greater coherency across multiple regional initiatives and various state districting boundaries.
- Work with the Department of Education to create a repository of STEM educational resources and curricula.
- Support the development of a one-stop website for parents and students about regional afterschool STEM programs and events.
- Advocate for support of out-of-school STEM

programs and increase capacity of provider networks and intermediaries.

- Work with ODE to advocate for extensive professional development and pre-service funding, especially in mathematics.

Early Learning:

- Provide professional development for early childcare providers emphasizing playful inquiry
- Promote multi-sensory, interactive learning environments, and discourage the use of worksheets or other methods that are focused on simple recall of math/science facts.
- Parental outreach and messaging regarding the importance of play and interactive experiences — particularly unstructured, outside nature play.

Department of Education:

- Work with the State Board of Education to recommend increased time on inquiry-based science of at least 3-4 hours per week in elementary school. Encourage elementary educators to integrate math and language arts with those science experiences.
- Include science assessments as part of the State's ESSA plan.
- Include afterschool STEM programming as part of Oregon's state plan for the Federal Every Student Succeeds Act.
- Use Code.org or other national framework to rapidly develop statewide computer science standards and have them adopted by the State Board by 2018. These should be part of a more comprehensive digital literacy plan, but should not be delayed while that broader plan is being developed.
- Create CTE Programs of Study frameworks that are pre-designed for customization at the local level and that are aligned to local, regional, and state high-wage, high-demand careers. Recommended state priorities include: 1) biomedical and health sciences, 2) computer science, 3) manufacturing, mechatronics, and engineering, 4) and precision agriculture.
- Work with Regional CTE Coordinators, CCWD, and community college CTE faculty to increase alignment and articulation of K-12 Programs of Study with community college CTE pathways.
- Streamline grants processes to reduce administrative burden on grantees and applicants and move more toward "outcomes-based" funding for STEM Hubs.
- Provide parent "briefs" on how to support their student in math and science.
- Work with COSA (administrators) and OSBA (school boards) to prioritize focus on applied learning in STEM and CTE.
- Communicate opportunities for districts to support quality STEM and CTE professional development and education using ESSA funding.
- Work with Regional STEM Hubs and ESDs to provide quality professional development for K-12 teachers and principals consistent with Math and Science standards and emphasizing applied learning connected to careers.
- Integrate STEM and CTE priorities into other statewide plans for educational improvement such as ESSA plan and increasing graduation rates.

Higher Education Coordinating Commission:

- Establish outcomes-based funding incentives with community colleges for students attaining credentials in high-wage, high-growth STEM and CTE programs, with additional incentive for students of color and first-generation college-goers.
- Increase the incentives within the university funding formula to encourage more programs aligned to high-wage, high-growth fields, as well as for underserved and underrepresented students attaining degrees in those fields.
- Continue to work with institutions to improve cross-institution consistency and effectiveness of math placement.
- Implement recommended changes in math developmental education courses to increase student success and appreciation of math.
- Redesign cross-institutional math course sequencing geared toward applied program needs.
- Work with ODE and educator preparation programs to increase focus on applied learning/teaching in math and science.
- Equity – continue to increase the availability of effective support programs for students of color and first-gen college goers.
- Work with ODE, Regional CTE Coordinators, and community college CTE leaders to increase alignment and articulation of K-12 Programs of Study with community college CTE pathways.
- Work with institutions and industry to increase undergraduate research opportunities and internships.
- Endorse and use the Brookings definition of STEM degrees and certificates.
- Adopt common course numbering and reciprocity in crediting across state institutions with particular emphasis on consistency in transferring from community college to university.
- Work with institutions to increase diversity in hiring STEM faculty.

Teacher Standards and Practices Commission:

- Develop a report analyzing STEM and CTE teacher supply and demand, anticipating retirements and regional shortages in Oregon's STEM and CTE educator workforce.
- Streamline licenser requirements for those with significant content experience in STEM and CTE industries.
- Increase recruitment and promotion of the STEM and CTE teaching profession.

CITATIONS

1 2015-2017 Oregon Talent Plan:
https://www.oregon.gov/EMPLOY/OTC/Documents/OTC_TalentPlanAdopted_11-12-2015.pdf

2 Oregon Economic Review and Forecast, September 8, 2015; accessed December 2, 2015:
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3 Ibid.

4 U.S. Department of Education,
The Nation's Report Card (2015), accessed on November 24, 2015,
http://nces.ed.gov/nationsreportcard/subject/publications/stt2015/pdf/2016009OR4.pdf.

5 Oregon STEM Employer Coalition, *Oregon Learns: Time to Invest Seriously in STEM* (2012)

6 Ibid.

7 Oregon Economic Review and Forecast, September 8, 2015; accessed December 2, 2015:
http://www.oregon.gov/DAS/OEA/docs/economic/oregon.pdf

8 Note that most of these are reflected in Oregon's 'Essential Skills' as well as the College and Career Readiness Standards: http://education.oregon.gov/wp-content/uploads/2015/09/Adopted-College-and-Career-Readiness-Definition.pdf

9 2016 Oregon Educator Equity Report:
http://education.oregon.gov/portfolio/2016-educator-equity-report/

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Docket Item: **7.1 Overview of STEM Education Plan**

Docket Summary:

Julia Steinberger will be presenting the Oregon STEM Education Plan. The 2021 STEM Education Plan maintains and builds off of the grand vision for STEM education set forth in the 2016 plan. The updated plan attempts to operationalize the existing goals and assign clear indicators, performance targets, and roles. This plan is highly ambitious, outlining roughly 40 different strategies to implement in order to achieve our four overarching goals. As such, we have identified 10 priority strategies that will be the main focus for the next biennium. While all outcomes and strategies identified in the 2021 STEM Education Plan are essential, we believe that the following strategies are the most critical in the near-term. She will go over the updates within the plan, including how the COVID-19 crisis has highlighted the need for STEM education.

Docket Materials:

2021 STEM Education Plan

Staff Recommendation:

None. This is an informational item only.

Docket Item: **8.2 STEM Innovation and Hub Backbone Grants Deliverables**

Docket Summary:

Deb Bailey and Tom Thompson of ODE will provide updates on STEM Innovation Projects.

Docket Materials:

Powerpoint STEM Innovation Grant Deliverables and Data

Staff Recommendation:

None. This is an informational item only.

STEM Innovation Grants

- STEM Innovation Grants are written with Intergovernmental Grant Agreements (IGAs)
  - Contracts between the Oregon Department of Education (ODE) and the Grantee's Fiscal Agent.
  - Work must have concrete and demonstrable deliverables achievable by end of contract period
  - Language of a logic model: STEM Hub Innovation Grant Deliverables are Outputs rather than Outcomes or Impacts.

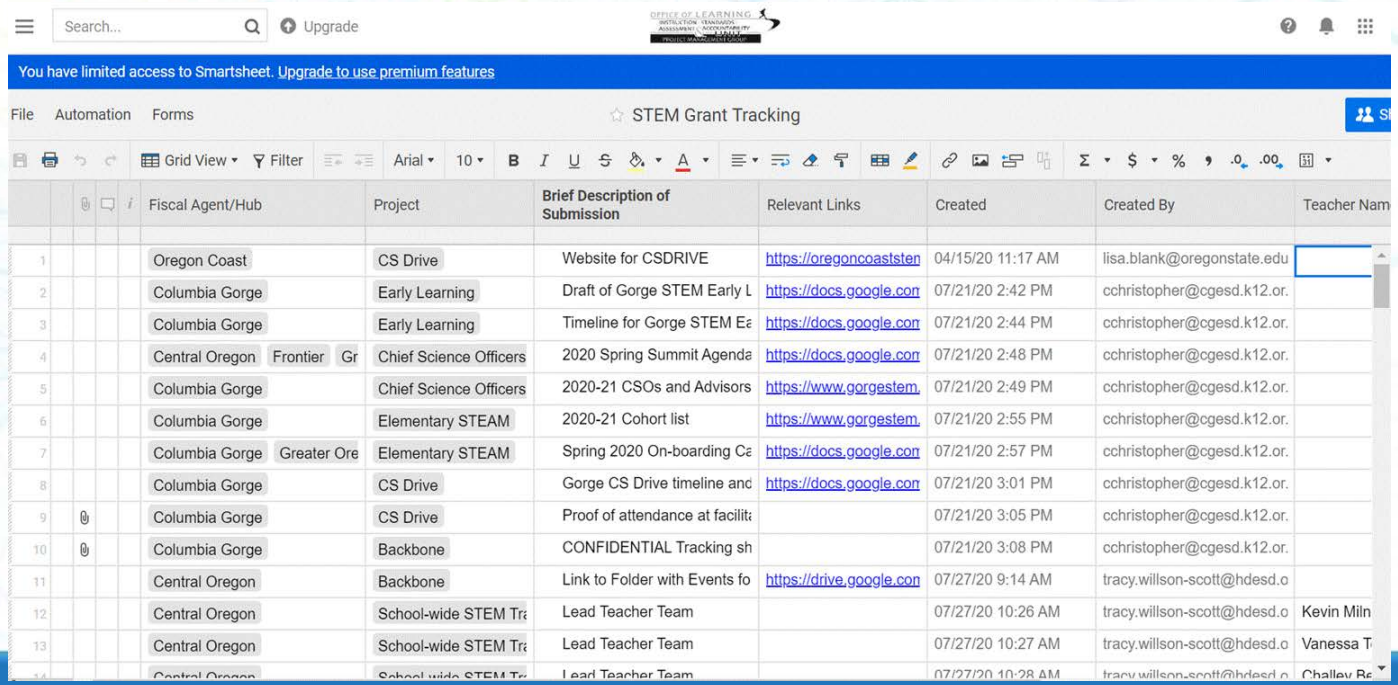
Deliverables STEM Innovation Grants

- Output Deliverable Examples
  - course agendas
  - participant attendance sheets
  - listings of event dates and activities
    - Reported: Quarterly, Yearly, Final reports.
    - Submitted through ‘Smartsheet’ form with option to link to larger google files and folders

- Learning Deliverable Examples
  - Equity Considerations
  - Best Practices Learned
  - Instructional Materials/PD Produced
  - Participant Feedback
  - Future modifications for improvement.
    - Reported: final reports provided 45 days after the close of the biennium.
    - Submitted through Smartsheet form

Data

- Data Collection: ‘Smartsheet’ form deliverables for Backbone and Innovation Grants
- Testing process for space to upload data some with google links
  - 114 submissions 7/28/2020



	Fiscal Agent/Hub	Project	Brief Description of Submission	Relevant Links	Created	Created By	Teacher Nam
1	Oregon Coast	CS Drive	Website for CSDRIVE	https://oregoncoaststen	04/15/20 11:17 AM	lisa.blank@oregonstate.edu	
2	Columbia Gorge	Early Learning	Draft of Gorge STEM Early L	https://docs.google.con	07/21/20 2:42 PM	cchristopher@cgesd.k12.or.	
3	Columbia Gorge	Early Learning	Timeline for Gorge STEM Ea	https://docs.google.con	07/21/20 2:44 PM	cchristopher@cgesd.k12.or.	
4	Central Oregon Frontier Gr	Chief Science Officers	2020 Spring Summit Agenda	https://docs.google.con	07/21/20 2:48 PM	cchristopher@cgesd.k12.or.	
5	Columbia Gorge	Chief Science Officers	2020-21 CSOs and Advisors	https://www.gorgestem.	07/21/20 2:49 PM	cchristopher@cgesd.k12.or.	
6	Columbia Gorge	Elementary STEAM	2020-21 Cohort list	https://www.gorgestem.	07/21/20 2:55 PM	cchristopher@cgesd.k12.or.	
7	Columbia Gorge Greater Ore	Elementary STEAM	Spring 2020 On-boarding Ca	https://docs.google.con	07/21/20 2:57 PM	cchristopher@cgesd.k12.or.	
8	Columbia Gorge	CS Drive	Gorge CS Drive timeline and	https://docs.google.con	07/21/20 3:01 PM	cchristopher@cgesd.k12.or.	
9	Columbia Gorge	CS Drive	Proof of attendance at facilita		07/21/20 3:05 PM	cchristopher@cgesd.k12.or.	
10	Columbia Gorge	Backbone	CONFIDENTIAL Tracking sh		07/21/20 3:08 PM	cchristopher@cgesd.k12.or.	
11	Central Oregon	Backbone	Link to Folder with Events fo	https://drive.google.con	07/27/20 9:14 AM	tracy.willson-scott@hdesd.o	
12	Central Oregon	School-wide STEM Tra	Lead Teacher Team		07/27/20 10:26 AM	tracy.willson-scott@hdesd.o	Kevin Miln
13	Central Oregon	School-wide STEM Tra	Lead Teacher Team		07/27/20 10:27 AM	tracy.willson-scott@hdesd.o	Vanessa T