

STEM Education Plan Proposed Revisions

May 2019

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.

Outcomes:

- 1) Increased K-12 student proficiency in STEM subjects
- 2) Increased K-12 student interest in and identify with STEM
- 3) Increased high school completers' preparedness for postsecondary STEM
- 4) Increased student participation and success in postsecondary STEM degree and credential programs

Strategies:

- 1) Raise awareness of STEM among students and families, particularly in the early years of education
- 2) Integrate STEM principles and strategies, including statewide math and science standards, into P-12 curricula
- 3) Increase access to STEM learning opportunities in high school

Key Initiatives:

- 1) Hold community STEM events, such as STEM family nights, that bring together families, community members, business/industry, etc.
- 2) Create STEM spaces, such as makerspaces, that are open to the public and accessible to underrepresented and underserved communities
- 3) Increase access to high quality out-of-school STEM and CTE
- 4) include statewide science assessment scores in Oregon's ESSA State Plan and school improvement plan process
- 5) Increase interactions of K-12 students with STEM professionals
- 6) Improve implementation of statewide math and science standards
- 7) Adopt statewide computer science standards
- 8) Increase the use of technology in the classroom
- 9) Increase availability of college-level STEM and CTE while in high school
- 10) Increase STEM-related CTE programs of study in high-demand fields
- 11) Increase the number of computer science courses offered in high school

Performance Targets

- Increase % of students deemed proficient on statewide math assessments to X% by year Y
- Increase percentage of K-12 students proficient on statewide science assessments to X% by year Y
- Increase participation on AP STEM discipline tests to the following %s by year x:
 - Calculus: A%
 - Statistics: B%
 - Computer Science: C%
 - Biology: D%
 - Chemistry: E%

- Physics: F%
- Increase % of students who self-report on the PSAT/SAT intent to pursue postsecondary STEM to X% by year Y
- Increase % of students selecting science electives in high school to X% by year Y
- Increase high school completion rate to X% by year Y
- Increase proficiency rates on SAT/ACT math and science to X and Y% by year Z
- Increase proficiency on STEM disciplines tests to the following %s by year X:
 - Calculus: A%
 - Statistics: B%
 - Computer Science: C%
 - Biology: D%
 - Chemistry: E%
 - Physics: F%
- Increase % of students completing at least 1 credit of college-level STEM credit in high school to X% by year Y
- Increase # and % of college-going students who enroll in postsecondary STEM degree or credential programs to X# and Y% by year Z
- Increase # and % of students completing postsecondary STEM degree or credential programs to X# and Y% by year Z
- Increase % of students who begin in a postsecondary STEM degree or credential program that persist to completion in that program to X% by year Y

Raise STEM awareness early

Initiatives	Lead	Supporting
Hold community STEM events	STEM Hubs	CBOs, B&I, STEM Council
Create accessible STEM spaces	STEM Hubs	CBOs, B&I, STEM Investment Council
Increase access to out-of-school STEM	CBOs, STEM Hubs	STEM Council, ODE

Integrate STEM into P-12

Include science in ESSA accountability and SIP process	ODE	K-12 admins, STEM Council, STEM Hubs
Increase student interactions with STEM professionals	STEM Hubs	B&I, K-12 educators, K-12 admins, STEM Council
Improve implementation of math and science standards	STEM Hubs	K-12 educators, K-12 admins
Adopt statewide computer science standards	ODE	K-12 educators
Increase use of technology in the classroom	K-12 admins, educators	STEM Hubs

Increase STEM learning opportunities in high school

Increase availability of college-level STEM/CTE in high school	HS admins	Higher ed
Increase STEM-related CTE Programs of Study in high-demand fields	HS admins	Higher ed
Increase # of computer science courses offered in high school	HS admins	ODE

Outcomes

Increased K-12 student proficiency in STEM subjects

Increased student interest/identity in STEM

Increased preparedness for college-level STEM

Increased student participation and success in postsecondary STEM

Performance Targets

↑ % of students proficient on statewide math assessments to X% by 2025

↑ % of students proficient on statewide science assessments to X% by 20XX

↑ % participation on AP STEM discipline tests to X% by 20XX

↑ % of students self reporting intent to pursue postsecondary STEM to X% by 20XX

↑ % of students selecting science electives in HS by X% by 20XX

↑ % of students reporting strong STEM interest/identity to X% by 20XX

↑ high school completion rate to X% by 20XX

↑ SAT/ACT math and science proficiency to X% by 20XX

↑ proficiency on AP STEM discipline tests to X% by 20XX

↑ # and % of students completing at least 1 credit of college-level STEM degree or credential programs to X and Y by 20XX

↑ # and % of college-going students who enroll in postsecondary STEM degree or credential programs to X and Y by 20XX

↑ # and % completing postsecondary STEM degree or credential programs to X and Y by 20XX

↑ persistence rate in postsecondary STEM programs to X% by 20XX

GOAL # 1 - Inspiring and Empowering Students

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

Outcomes

- 1) Increase participation in and completion of STEM discipline courses and programs in high school by students from underserved and underrepresented communities
- 2) Increase enrollment of underserved and underrepresented students in postsecondary STEM degree and credential programs
- 3) Increase persistence in and completion of postsecondary STEM degrees and credentials by student from underserved and underrepresented communities

Strategies

- 1) Help students from underserved and underrepresented communities to see STEM careers as realistic and worthwhile futures
- 2) Provide financial and non-financial supports for STEM students from underserved and underrepresented communities

Key Initiatives

- 1) Increase P-12 student interactions with STEM professionals and degree seekers from underserved and underrepresented communities
- 2) Increase use of culturally relevant, place-based contexts as basis for student inquiry and applied learning
- 3) Increase student and family access to understandable, up-to-date market data regarding high-wage, high-demand career opportunities by improving student advising, career counseling services, and guidance tools
- 4) Increase need-based financial support for students from underserved/underrepresented communities pursuing high-wage, high-demand STEM credentials degrees
- 5) Increase number/quality of support services, such as mentorships and counseling, and pre-college transition programs for students from underserved/underrepresented communities pursuing high-wage, high-demand STEM credentials and degrees
- 6) Increase access to alumni and professional networks for students from underserved and underrepresented communities
- 7) Increase paid STEM and CTE internships, work-based and service-learning opportunities, and undergraduate research opportunities in high-demand fields

Performance Targets

- Increase the number of underserved and underrepresented students enrolling in STEM electives and/or STEM CTE programs to X# by year Y
- Increase the number of underserved and underrepresented students enrolling in postsecondary STEM degree and credential programs to X by year Y
- Increase the number of underserved and underrepresented students completing postsecondary STEM degrees and credentials to X # by year Y
- Increase the percentage of underserved and underrepresented students who begin in a STEM degree or credential program that complete that program to X% by year Y

Help underserved/underrepresented students to see futures in STEM

Initiatives	Lead	Supporting
Increase P-12 student interactions with STEM professionals underserved/underrepresented communities	STEM Hubs	CBOs, B&I K-12 educators, K-12 admins
Increase use of culturally relevant, place based contexts as basis for student inquiry and applied learning	STEM Hubs, K-12 admins	K-12 educators, CBOs
Increase student and family access to understandable, up-to-date career data	K-12 admins	OED, CBOs, higher ed

Provide financial/non-financial supports for underserved/underrepresented STEM students

Increase needs-based financial support for underserved/underrepresented postsecondary STEM students	Higher ed	STEM Hubs, CBOs
Increase and strengthen non-financial support services for underserved/underrepresented postsecondary STEM students	Higher ed, HECC	B&I, CBOs
Increase access to alumni and professional networks for students of color	Higher ed	CBOs, B&I, STEM Hubs
Increase paid STEM and CTE internships, work and research-based learning opportunities for underserved/underrepresented	Higher ed, business/ industry	STEM Hubs, CBOs, HECC

Outcomes

Increase participation in/completion of STEM discipline courses/programs in high school by underserved/underrepresented students

Increase enrollment of underserved and underrepresented students in postsecondary STEM degree and credential programs

Increase persistence in and completion of postsecondary STEM degrees and credentials by students from underserved and underrepresented communities

Performance Targets

↑ Increase # of underserved/underrepresented students enrolled in high school STEM electives/CTE programs of study by X by year Y

↑ Increase # of underserved/underrepresented students enrolled in postsecondary STEM programs to X by year Y

↑ Increase # of underserved/underrepresented students earning postsecondary STEM degrees/credentials by X by year Y

↑ Increase % of underserved/underrepresented students who begin in a postsecondary STEM program that complete that program to X% by year Y

GOAL # 2 - Ensuring Equitable Access

GOAL 3: Continuously improve the effectiveness, support, and number of formal and informal P-20 STEM educators Priority Outcomes

- 1) Increase STEM pedagogy knowledge and expertise in Oregon's educator workforce
- 2) Educators use high quality STEM instructional resources and curricula in the classroom
- 3) Educators understand the value of STEM-based learning
- 4) Increased time for educator-to-educator collaboration and planning
- 5) New educators are well trained in STEM pedagogy

Strategies

- 1) Properly train and equip Oregon's teaching workforce
- 2) Increase administrator understanding of the power of STEM to transform learning outcomes for students
- 3) Support teacher preparation programs that promote effective, standards-informed STEM teaching strategies, and experiences with STEM employers

Key Initiatives

- 1) Create repositories of elementary, middle, and high school high-quality instructional resources that engage learners in rich, authentic applications of STEM concepts
- 2) Cultivate a corps of STEM teacher leaders to provide STEM leadership at the school, district, and state level
- 3) Increase number of opportunities for educators to experience STEM in industry/research
- 4) Increase STEM-based professional development offerings and communities of practice for classroom educators
- 5) Provide professional development on STEM to school and district administrators
- 6) Promote/celebrate educators, administrators, schools, and districts embracing STEM
- 7) Increase access to educator preparation tracks that include robust training in STEM pedagogy and STEM subject matter
- 8) Incentivize practicum hours to be earned in classrooms implementing STEM pedagogy
- 9) Include educator preparation faculty in STEM communities of practice

Performance Targets

- Increase % of Oregon's educators who have received STEM-based professional development to X% by year Y
- At least X% of educators receiving PD self-reporting using STEM pedagogy, instructional resources, and curricula from PD in their classrooms
- At least X% of educators receiving PD self-report that they believe in the value of STEM-based learning
- Increase % of schools with recognized STEM teacher leader roles to X % by year Y
- Increase % of educator preparation program completers with a STEM focus, minor, or credential to X% by year Y
- Increase average number of required credits with a STEM element to X credits by year Y
- Increase % of educator preparation program enrollees who complete their practicum credit hours in STEM classrooms to X % by year Y

Properly train and equip Oregon's teaching workforce

Initiatives	Lead	Supporting
Create repository of STEM instructional resources	STEM Hubs	ODE, STEM Council
Cultivate STEM Teacher Leader Corps	STEM Hubs	ODE, K-12 administrators, K-12 educators
Increase industry-based experiences for STEM/CTE educators	STEM Hubs	K-12 administrators, ODE
Increase STEM-based professional development offerings for educators	K-12 administrators	STEM Hubs, K-12 educators, ODE

Increase administrator understanding of and buy-in to STEM pedagogy

Increase STEM-based professional development offerings for educators	STEM Hubs	K-12 administrators, ODE, STEM Council
Promote and celebrate educators, administrators, schools, and districts embracing STEM	STEM Hubs	STEM Council

Support STEM integration in teacher preparation programs

Increase STEM-focused tracks in educator preparation programs	Colleges/universities	TSPC, ODE, K-12 administrators
Incentivise practicum hours to be earned STEM classrooms	Colleges/universities	TSPC, ODE, K-12 administrators
Include educator preparation faculty in STEM communities of practice	STEM Hubs	Colleges/universities, ODE

Outcomes

- 1) Increase number of Oregon's educators trained in STEM pedagogy
- 2) Educators use high quality STEM instructional resources and curricula in the classroom
- 3) Oregon's STEM educators understand the value of STEM-based learning and how their curricula relate to real world opportunities
- 4) Increased time for educator-to-educator collaboration and planning

Produce teachers who are equipped with experience using STEM teaching strategies

Performance Targets

↑ Increase % of Oregon's elementary/middle school educators trained in STEM to X% by year Y

↑ At least X% of educators receiving PD report using STEM in their classrooms

↑ At least X% of educators receiving PD report believing in STEM's value

↑ Increase % of elementary/middle schools with STEM teacher leader roles to X% by year Y

↑ Increase % of educator preparation program completers with a STEM focus, minor, or credential to X% by year Y

↑ Increase average # of educator preparation programs' required credits with a STEM focus to X credits by year Y

↑ Increase % of educator preparation program enrollees who complete practicum in STEM classrooms to X% by year Y

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

Priority Outcomes

- 1) Increased funding for Regional STEM Hub Network in ODE base budget
- 2) Increase funding for STEM Innovation Grants in ODE base budget
- 3) Increased funding for STEM Investment Council
- 4) Increased private funding for STEM
- 5) STEM is integrated into key statewide initiatives and networks

Strategies

- 1) Improve statewide data collection and analysis
- 2) Raise awareness and understanding of STEM education among key leaders and decision makers
- 3) Leverage existing resources and initiatives to advance STEM

Key Initiatives

- 1) Create a data dashboard that publicly monitors progress on key STEM indicators of the state's connected STEM-CTE education, economic, and workforce system
- 2) Develop and implement a STEM communications campaign
- 3) Hold statewide STEM Summit(s)
- 4) Increase the number of community-based STEM events
- 5) Develop and implement an education campaign targeted at local, regional, and state decision makers
- 6) Improve the quality and relevance of postsecondary mathematics placement processes and align course content to relevant degree and certificate program needs
- 7) Partner with CTE and accelerate learning sectors to braid funding and combine resources to accomplish common goals

Performance Targets

- Funding for STEM Hub Network in the 2021-23 budget is \$8 million
- Funding for STEM Innovation Grants in the 2021-23 budget is \$8 million
- Funding for the STEM Investment Council in the 2021-23 budget is \$1 million
- By 2022, approve and implement common processes and measures across institutions for placement in mathematics, and realign grades 9-14 mathematics curriculum to better reflect differing degree/certificate program needs
- By 2022, elementary and middle schools begin to track time spent on science
- By FY 2021, integration of STEM is a requirement for Measure 98 funding

GOAL # 4 - Creating a Sustainable System

Improve statewide data collection and analysis

Initiatives	Lead	Supporting
Create a data dashboard of key STEM indicators	STEM Investment Council	ODE, HECC, OED, STEM Hub Network

Raise awareness and understanding of STEM education

Develop + implement STEM communications campaign	STEM Investment Council	ODE, HECC, STEM Hub Network, business/industry
Hold statewide STEM Summit(s)	STEM Investment Council	ODE, HECC, STEM Hub Network, business/industry, NGOs, CBOs
Increase number of STEM community-based events	STEM Hub Network	business/industry, NGOs, CBOs
Develop + implement education outreach plan targeted at local, regional, and state decision-makers	STEM Hub Network	STEM Investment Council, business/industry, NGOs, CBOs

Leverage existing resources and initiatives to advance STEM

Improve quality/relevance of postsecondary mathematics placement	ODE, HECC	K-12 administrators, K-12 educators, higher ed
Strengthen STEM's inclusion in Oregon's ESSA implementation	ODE	K-12 administrators
Partner with CTE and accelerated learning sectors to braid funding and combines resources to accomplish	STEM Hub Network	CTE Network, ODE, HECC

Outcomes

- 1) Increased funding for regional STEM Hub Network in ODE budget
- 2) Increased funding for STEM Innovation Grants in ODE budget
- 3) Increased funding for STEM Council
- 4) Increase private funding for STEM

STEM is integrated into key statewide initiatives/networks

Performance Targets

Funding for STEM Hub Network in 2021-23 budget is \$8M

Funding for STEM Innovation Grants in 2021-23 budget is \$8M

Funding for STEM Investment Council in 2021-23 budget is \$1M

By 2020, approve + implement common mathematics placement

Elementary/middle schools begin to track time spent on science

By FY 2020, integration of STEM is a requirement for Measure 98 funding