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:
  o Calculus: A%
  o Statistics: B%
  o Computer Science: C%
  o Biology: D%
  o Chemistry: E%
• 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:
  o Calculus: A%
  o Statistics: B%
  o Computer Science: C%
  o Biology: D%
  o Chemistry: E%
  o 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**

<table>
<thead>
<tr>
<th>Initiatives</th>
<th>Lead</th>
<th>Supporting</th>
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<tbody>
<tr>
<td>Hold community STEM events</td>
<td>STEM Hubs</td>
<td>CBOs, B&amp;I, STEM Council</td>
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<tr>
<td>Create accessible STEM spaces</td>
<td>STEM Hubs</td>
<td>CBOs, B&amp;I, STEM Investment Council</td>
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<tr>
<td>Increase access to out-of-school STEM</td>
<td>CBOs, STEM Hubs</td>
<td>STEM Council, ODE</td>
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**Integrate STEM into P-12**

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<tr>
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<tr>
<td>Include science in ESSA accountability and SIP process</td>
<td>ODE</td>
<td>K-12 admins, STEM Council, STEM Hubs</td>
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<tr>
<td>Increase student interactions with STEM professionals</td>
<td>STEM Hubs</td>
<td>B&amp;I, K-12 educators, K-12 admins, STEM Council</td>
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<tr>
<td>Improve implementation of math and science standards</td>
<td>STEM Hubs</td>
<td>K-12 educators, K-12 admins</td>
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<tr>
<td>Adopt statewide computer science standards</td>
<td>ODE</td>
<td>K-12 educators</td>
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<tr>
<td>Increase use of technology in the classroom</td>
<td>K-12 admins, educators</td>
<td>STEM Hubs</td>
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**Increase STEM learning opportunities in high school**

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<tr>
<td>Increase availability of college-level STEM/CTE in high school</td>
<td>HS admins</td>
<td>Higher ed</td>
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<tr>
<td>Increase STEM-related CTE Programs of Study in high-demand fields</td>
<td>HS admins</td>
<td>Higher ed</td>
</tr>
<tr>
<td>Increase # of computer science courses offered in high school</td>
<td>HS admins</td>
<td>ODE</td>
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**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
- Increased # 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
- % 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

**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 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

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<td>STEM Hubs</td>
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<td>Increase use of culturally relevant, place based contexts as basis for student inquiry and applied learning</td>
<td>STEM Hubs, K-12 admins</td>
<td>K-12 educators, CBOs</td>
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<td>Increase student and family access to understandable, up-to-date career data</td>
<td>K-12 admins</td>
<td>OED, CBOs, higher ed</td>
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Provide financial/non-financial supports for underserved/underrepresented STEM students

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

- Increase participation in/completion of STEM discipline courses/programs in high school by underserved/underrepresented students
  - Increase # of underserved/underrepresented students enrolled in high school STEM electives/CTE programs of study by X by year Y

- Increase enrollment of underserved and underrepresented students in postsecondary STEM degree and credential programs
  - Increase # of underserved/underrepresented students enrolled in postsecondary STEM programs to X by year Y

- Increase persistence in and completion of postsecondary STEM degrees/credentials by students from underserved and underrepresented communities
  - Increase % of underserved/underrepresented students who begin in a postsecondary STEM program that complete that program to X% by year Y
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**

1. Create repository of STEM instructional resources
2. Cultivate STEM Teacher Leader Corps
3. Increase industry-based experiences for STEM/CTE educators
4. Increase STEM-based professional development offerings for educators

**Lead**

STEM Hubs

**Supporting**

ODE, STEM Council

K-12 administrators, K-12 educators

K-12 administrators, ODE

K-12 administrators

### 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

### 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 \( Y \)

## Increase administrator understanding of and buy-in to STEM pedagogy

**Initiatives**

1. Increase STEM-based professional development offerings for educators
2. Promote and celebrate educators, administrators, schools, and districts embracing STEM

**Lead**

STEM Hubs

**Supporting**

K-12 administrators, ODE

STEM Hubs, K-12 educators, ODE

STEM Hubs, STEM Council

### Outcomes

1. Increase % of Oregon’s elementary/middle school educators trained in STEM to \( X\% \) by year \( Y \)
2. At least \( X\% \) of educators receiving PD report using STEM in their classrooms
3. At least \( X\% \) of educators receiving PD report believing in STEM’s value
4. Increase % of elementary/middle schools with STEM teacher leader roles to \( X\% \) by year \( Y \)

## Support STEM integration in teacher preparation programs

**Initiatives**

1. Increase STEM-focused tracks in educator preparation programs
2. Incentivise practicum hours to be earned STEM classrooms
3. Include educator preparation faculty in STEM communities of practice

**Lead**

Colleges/universities

TSPC, ODE, K-12 administrators

STEM Hubs

**Supporting**

ODE, STEM Council

K-12 administrators

Colleges/universities, ODE

### Outcomes

1. Produce teachers who are equipped with experience using STEM teaching strategies

### Performance Targets

- 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
**Improve statewide data collection and analysis**

**Initiatives**
- Create a data dashboard of key STEM indicators

**Lead**
- STEM Investment Council

**Supporting**
- ODE, HECC, OED, STEM Hub Network

**Raise awareness and understanding of STEM education**

**Initiatives**
- Develop + implement STEM communications campaign
- Hold statewide STEM Summit(s)
- Increase number of STEM community-based events
- Develop + implement education outreach plan targeted at local, regional, and state decision-makers

**Lead**
- STEM Investment Council

**Supporting**
- ODE, HECC, STEM Hub Network, business/industry
- ODE, HECC, STEM Hub Network, business/industry, NGOs, CBOs
- business/industry, NGOs, CBOs
- STEM Investment Council, business/industry, NGOs, CBOs

**Leverage existing resources and initiatives to advance STEM**

**Initiatives**
- Improve quality/relevance of postsecondary mathematics placement
- Strengthen STEM’s inclusion in Oregon’s ESSA implementation
- Partner with CTE and accelerated learning sectors to braid funding and combines resources to accomplish

**Lead**
- ODE, HECC
- ODE
- STEM Hub Network

**Supporting**
- K-12 administrators, K-12 educators, higher ed
- K-12 administrators
- 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

**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

**GOAL # 4 - Creating a Sustainable System**

- 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