SW Washington STEM Program Overview

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In addition to traditional K-12 course work and post-secondary degree program in math, science, engineering, and technology, SW Washington has approximately **14 organizations running over 20 STEM programs** that seek to increase student interest in and preparation for STEM careers.

- STEM programs typically fell into four categories: hands-on activities and camps for students; student mentoring, tutoring or coaching; specific STEM courses and alignment of high school and college level course work; and teacher training and professional development. Few programs mentioned career exploration as a primary activity.
- Approximately 40% are run by K-12 institutions; 25% by higher education organizations and 33% by educational non-profits.
- Staff sizes and budgets for these program range from 1-15 FTEs, and funding from less than $50,000 per year to $2,000,000.
- 67% of programs serve high school students, 33% serve middle school, 25% serve post-secondary students, and less than 10% serve primary grades of adult job seekers.
- More than 50% of listed programs serve multiple counties; Clark County was serve by 83% of STEM programs, Cowlitz County by 46%, Skamania and Wahkiakum County by 33%, Columbia County by 17%, and 25% also reached counties in Oregon.
- As a facet of their overall programs, more than 60% of STEM programs target specific populations including students of color, females, low-income youth, "B/C" students, high school drop outs, and private/home school students.
- About 60% of programs worked with employers, with involvement ranging from 10 to 200 companies per year for these programs.

Student Outreach & Activity Programs

- MESA: Through MESA, students of color and girls achieve their full potential in math, engineering, and science. MESA provides academic enrichment to students who, as adults, are underrepresented in STEM fields: African Americans, Latino/as, Native Americans, and female students, in a supportive, challenging, and fun learning community. MESA helps close the academic achievement gap and set students on the path to careers in STEM fields thereby strengthening and diversifying the workforce in the state of Washington.

- MAPS: MAPS links businesses and professionals in the community with high school teachers and students for mentoring in math and science available to students enrolled in AP classes and subject to availability of mentors.

- Saturday Academy**:** Saturday Academy offers STEM educational enrichment to youth in grades 2-12 through three program models: Catalog Classes & Camps, high school Apprenticeships in Science & Engineering (ASE), and Saturday Academy in the Schools (LEAP & AfterSchool). Our mission is to inspire young people to explore their world through hands-on, inquiry-based learning with community experts and professionals. Our goal is to reinforce the joy of learning, assist young people in developing intellectually and help them prepare for rewarding careers in STEM-related fields.
- Gateway To Technology's® (GTT) cutting-edge program addresses the interest and energy of middle school students, while incorporating national standards in mathematics, science, and technology. Gateway To Technology® is "activity oriented" to show students how technology is used in engineering to solve everyday problems in units of study. There are currently four instructional units that excite and motivate students to use their imaginations and teach them to be creative and innovative, while gaining the skills they need to develop, produce, and use products and services.
- SEMI High Tech U is an industry driven, career exposure program targeting high school sophomores, juniors and seniors that provides hands on activities and lectures in math, science and technology.
- LCC High School STEM outreach: Program of quarterly science/engineering outreach for high school juniors and seniors
- Competitions: More than 11 middle schools and 10 high schools (17 teams) compete in the Washington Science Olympiad and approximately six schools reported participation in the robotics competition.

General Programs with STEM components

- Youth Workforce: Provide educational and career development training to income-eligible youth, ages 16-21. Emphasis on high completion and career exploration for high demand occupations including pre-apprenticeships and apprenticeships, as well as post-secondary training/education opportunities.

Curriculum Focused Programs

- Project Lead The Way is all about teaching and learning. The hands-on, project and problem-based PLTW approach adds rigor to traditional technical programs and relevance to traditional academics. PLTW's curriculum makes math and science relevant for students. By engaging in hands-on, real-world projects, students understand how the skills they are learning in the classroom can be applied in everyday life. This approach is called activities-based learning, project-based learning, and problem-based learning or APPB-learning.

Battleground Project Lead the Way - (Pre-Engineering Program) Introduction to Engineering Design is the first course in a series of classes based on the national Project Lead the Way -pre-engineering training program. This introductory course will be offered for the first time at Prairie High School during the 2008-09 school year. Subsequent courses will be added as the program develops.

- GK-12: The National Science Foundation's Graduate Teaching Fellows in K-12 Education (GK-12) Program supports teaching fellowships for graduate students in the sciences, mathematics, engineering, and technology (SMET) disciplines. WSU-V has GK 12 fellowships in Environmental Sciences.
- Leadership and Assistance for Science Education Reform (LASER) LASER offers conferences, institutes, workshops, and advanced implementation academies to help school districts plan, implement, and sustain effective science education programs.
- Great Explorations in Math & Science (NW GEMS) GEMS is a high-quality, flexible curriculum bringing exciting and effective science and math activities into school classrooms. The aim of each GEMS activity is to captivate the imagination while illuminating essential scientific concepts and methods...
- Southwest Washington-Transitions in Mathematics Education (SW-TIME) is a new program. Washington State University, Vancouver (WSUV), in partnership with Clark College and two regional K-12 school districts, Battleground and Evergreen, is exploring and developing a substantive regional plan that will target high school students who have passed the 10th grade math WASL exam, do not elect to take any more math in junior or senior years, but may, nonetheless, go to college.
- The LCC Transition Math Project is designed to help students successfully progress from high school math to college-level math and offers a math curriculum Summer Institute for teachers that reviews the Transition Math Projects College Readiness Standards, identifies exit points in curriculum that meet those standards, and determines possible course/sequence equivalencies between high schools and LCC.
- Clark County Skills Center Pre-Engineering: Prepares students to go directly to work or to continue their education in health careers, engineering, and, computer sciences.

Teaching & Professional Development Programs

- Science and Math Advancement Reachout for Teachers Conferences (SMART) SMART represents an alliance of school teachers, grades K-12, higher education faculty and representatives of local industry organized to provide support for science and math teachers.
- Partnership in Reform in Secondary Science & Mathematics (PRiSSM) Provide long-term professional development related to science and

mathematics for teachers of grades 6-12 leading to conceptual and applicable student learning.

- Math Helping Corp The Washington State Math Helping Corps (MHC) Program is designed to assist schools in becoming better at teaching mathematics by providing a mentor to work intensively with building staff for two years.
- NO LIMIT! The NO LIMIT (New Outcomes: Learning Improvement in Mathematics Integrating Technology) Grant is funded through a federal grant called the Technology Literacy Challenge Fund. This grant targets schools with low achievement in mathematics and a high need for technology.

Supporting Grants

In addition to ongoing STEM programs, there are a number of grants that have been awarded to SW Washington institutions to support STEM by increasing staff and equipment or integrating STEM programs. These grants total more than $700,000 and include:

- NSF Stem-to-Stern grant to improve STEM retention (2nd year of three-year grant, in partnership with Bellevue Community College).
- NST Course, Curriculum, and Laboratory Improvement grant to purchase a Nuclear Magnetic Resonance Spectroscope and integrate it into the chemistry curriculum (1st year of three year grant).
- Washington State Board for Community and Technical Colleges High Demand Grant to integrate Math and Science in the Early Childhood Education program (1st year of annually recurring funding).
- Washington State Board for Community and Technical Colleges High Demand Grant to increase STEM FTES (2nd year of annually recurring funding).
- Microsoft Peer-Tutoring/Coaching grant for all level of schools; Sustainable Classroom Coaching grant for all level of schools; Middle School "No Limit" grant for math integration; e-rate pilot project
- Have applied for and anticipate receiving the Weyerhauser grant to support all levels of schools for integrated technology and National Board Certifications for staff.

[NOTE: There are programs like the Oregon Museum of Science ad Industry that serve as a regional assets but do not have specific programs in SW Washington: Need to know how you want to handle those]

Associate Degrees & Certificates

Two community colleges (Lower Columbia College and Clark College) serve the area with associate and transfer degrees and certificates in the following STEM areas:

- Accounting*
- Accounting Technician
- Architecture*
- Audio Production
- Bioengineering/Chemical Engineering*
- Biological Sciences*
- Biology Education
- Business Technology
- Chemistry*
- Computer Aided Design
- Computer Science*
- Earth Sciences*
- Economics*
- Electrical and Computer Engineering*
- Electronics
- Electronics Technology - Basic Computer Hardware Concepts
- Electronics Technology - Basic National Electrical Code
- Electronics Technology - Industrial Automation
- Field Survey Technician
- Environmental Science*
- Fire Science Technology
- General Science
- Geology*
- Information Technology
- Instrumentation and Controls
- Machine Technology
- Management Information Systems*
- Math Education*
- Mathematics*
- Mechanical, Civil and Aeronautical Engineering*
- Natural Resources*
- Nursing
- Physics*
- Physics Education*
- Pulp & Paper Technology
- Psychology*

* transfer degrees

Washington State University-Vancouver

WSU-V provides undergraduate and graduate degree programs in the following areas:

Undergraduate Degrees:
Biology
Computer Sciences
Digital Technology & Culture
Electrical Engineering
Environmental Sciences
Mechanical Engineering
Nursing
Psychology

Graduate Degrees
Computer Science
Environmental Science
Mechanical Engineering
Nursing

Apprenticeships:

A growing number of apprenticeships are related to STEM occupations. In the State of Washington, over 120 apprenticeships support STEM careers. These programs are highlighted below

SOC	Occupation Title	STEM DISCP
19-2011.00	Astronomers	Physics/Astronomy
19-2021.00	Atmospheric and Space Scientists	Physics/Astronomy
29-2033.00	Nuclear Medicine Technologists	Physics/Astronomy
19-2012.00	Physicists	Mathematics, Physics/Astronomy
25-1054.00	Physics Teachers, Postsecondary	Mathematics, Physics/Astronomy
15-2011.00	Actuaries	Mathematics
15-2021.00	Mathematicians	Mathematics
15-2091.00	Mathematical Technicians	Mathematics
15-2099.99	Mathematical Science Occupations, All Other	Mathematics
25-1022.00	Mathematical Science Teachers, Postsecondary	Mathematics
25-1071.00	Health Specialties Teachers, Postsecondary	Life Sciences, Physics/Astronomy
15-2041.00	Statisticians	Life Sciences, Mathematics
11-9011.01	Nursery and Greenhouse Managers	Life Sciences
11-9011.02	Crop and Livestock Managers	Life Sciences
11-9012.00	Farmers and Ranchers	Life Sciences
13-1041.01	Environmental Compliance Inspectors	Life Sciences
19-1011.00	Animal Scientists	Life Sciences
19-1012.00	Food Scientists and Technologists	Life Sciences
19-1020.01	Biologists	Life Sciences
19-1022.00	Microbiologists	Life Sciences
19-1023.00	Zoologists and Wildlife Biologists	Life Sciences
19-1029.99	Biological Scientists, All Other	Life Sciences
19-1031.01	Soil and Water Conservationists	Life Sciences
19-1031.02	Range Managers	Life Sciences
19-1031.03	Park Naturalists	Life Sciences
19-1041.00	Epidemiologists	Life Sciences
19-1042.00	Medical Scientists, Except Epidemiologists	Life Sciences
19-1099.99	Life Scientists, All Other	Life Sciences
19-4011.01	Agricultural Technicians	Life Sciences
19-4011.02	Food Science Technicians	Life Sciences
19-4021.00	Biological Technicians	Life Sciences
19-4093.00	Forest and Conservation Technicians	Life Sciences
25-1041.00	Agricultural Sciences Teachers, Postsecondary	Life Sciences
25-1042.00	Biological Science Teachers, Postsecondary	Life Sciences
25-1192.00	Home Economics Teachers, Postsecondary	Life Sciences
25-9021.00	Farm and Home Management Advisors	Life Sciences
29-1031.00	Dietitians and Nutritionists	Life Sciences
29-2051.00	Dietetic Technicians	Life Sciences
33-3031.00	Fish and Game Wardens	Life Sciences
45-1011.06	First-Line Supervisors/Managers of Aquacultural Workers	Life Sciences

45-1011.07	First-Line Supervisors/Managers of Agricultural Crop and Horticultural Workers	Life Sciences
45-1011.08	First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers	Life Sciences
45-2021.00	Animal Breeders	Life Sciences
25-1051.00	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	Geosciences, Mathematics, Physics/Astronomy
19-2042.00	Geoscientists, Except Hydrologists and Geographers	Geosciences
19-2043.00	Hydrologists	Geosciences
19-2041.00	Environmental Scientists and Specialists, Including Health	Environmental Science
19-4091.00	Environmental Science and Protection Technicians, Including Health	Environmental Science
19-4099.99	Life, Physical, and Social Science Technicians, All Other	Environmental Science
25-1053.00	Environmental Science Teachers, Postsecondary	Environmental Science
19-4051.01	Nuclear Equipment Operation Technicians	Engineering, Physics/Astronomy
19-4051.02	Nuclear Monitoring Technicians	Engineering, Physics/Astronomy
17-2021.00	Agricultural Engineers	Engineering, Life Sciences
19-1032.00	Foresters	Engineering, Life Sciences
19-2099.99	Physical Scientists, All Other	Engineering, Life Sciences
45-4011.00	Forest and Conservation Workers	Engineering, Life Sciences
17-2199.99	Engineers, All Other	Engineering, Geosciences
11-9021.00	Construction Managers	Engineering
13-1051.00	Cost Estimators	Engineering
17-1011.00	Architects, Except Landscape and Naval	Engineering
17-2011.00	Aerospace Engineers	Engineering
17-2031.00	Biomedical Engineers	Engineering
17-2051.00	Civil Engineers	Engineering
17-2071.00	Electrical Engineers	Engineering
17-2072.00	Electronics Engineers, Except Computer	Engineering
17-2081.00	Environmental Engineers	Engineering
17-2111.01	Industrial Safety and Health Engineers	Engineering
17-2111.02	Fire-Prevention and Protection Engineers	Engineering
17-2111.03	Product Safety Engineers	Engineering
17-2112.00	Industrial Engineers	Engineering
17-2121.01	Marine Engineers	Engineering
17-2121.02	Marine Architects	Engineering
17-2131.00	Materials Engineers	Engineering
17-2141.00	Mechanical Engineers	Engineering
17-2151.00	Mining and Geological Engineers, Mining Safety Engineers	Engineering
17-2161.00	Nuclear Engineers	Engineering
17-2171.00	Petroleum Engineers	Engineering
17-3011.01	Architectural Drafters	Engineering
17-3011.02	Civil Drafters	Engineering
17-3021.00	Aerospace Engineering and Operations Technicians	Engineering
17-3022.00	Civil Engineering Technicians	Engineering
17-3025.00	Environmental Engineering Technicians	Engineering
17-3026.00	Industrial Engineering Technicians	Engineering
17-3027.00	Mechanical Engineering Technicians	Engineering

17-3029.99	Engineering Technicians, Except Drafters, All Other	Engineering
19-2032.00	Materials Scientists	Engineering
25-1031.00	Architecture Teachers, Postsecondary	Engineering
49-3023.01	Automotive Master Mechanics	Engineering
49-3023.02	Automotive Specialty Technicians	Engineering
51-2023.00	Electromechanical Equipment Assemblers	Engineering
53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	Engineering
15-2031.00	Operations Research Analysts	Computer Science, Mathematics
25-1011.00	Business Teachers, Postsecondary	Computer Science, Mathematics
15-1031.00	Computer Software Engineers, Applications	Computer Science, Engineering
15-1032.00	Computer Software Engineers, Systems Software	Computer Science, Engineering
17-2061.00	Computer Hardware Engineers	Computer Science, Engineering
17-3023.01	Electronics Engineering Technicians	Computer Science, Engineering
17-3023.03	Electrical Engineering Technicians	Computer Science, Engineering
11-3021.00	Computer and Information Systems Managers	Computer Science
13-2011.01	Accountants	Mathematics & Computer Science
13-2011.02	Auditors	Mathematics & Computer Science
15-1011.00	Computer and Information Scientists, Research	Computer Science
15-1021.00	Computer Programmers	Computer Science
15-1041.00	Computer Support Specialists	Computer Science
15-1051.00	Computer Systems Analysts	Computer Science
15-1061.00	Database Administrators	Computer Science
15-1071.01	Computer Security Specialists	Computer Science
15-1081.00	Network Systems and Data Communications Analysts	Computer Science
15-1099.99	Computer Specialists, All Other	Computer Science
25-1021.00	Computer Science Teachers, Postsecondary	Computer Science
27-1024.00	Graphic Designers	Computer Science
51-4012.00	Numerical Tool and Process Control Programmers	Computer Science
19-2031.00	Chemists	Chemistry, Physics/Astronomy
19-1013.00	Soil and Plant Scientists	Chemistry, Life Sciences, Physics/Astronomy
19-1021.00	Biochemists and Biophysicists	Chemistry, Life Sciences, Physics/Astronomy
19-4031.00	Chemical Technicians	Chemistry, Life Sciences
25-1052.00	Chemistry Teachers, Postsecondary	Chemistry, Geosciences
17-2041.00	Chemical Engineers	Chemistry, Engineering
11-9041.00	Engineering Managers	Chemistry, Computer Science, Engineering,
25-1032.00	Engineering Teachers, Postsecondary	Chemistry, Computer Science, Engineering,
11-9121.00	Natural Sciences Managers	Chemistry, Geosciences, Life Sciences, Mathematics, Physics/Astronomy
51-8091.00	Chemical Plant and System Operators	Chemistry
51-9011.00	Chemical Equipment Operators and Tenders	Chemistry