

Background Information on Panelists:

1. Mr. Jackson Jamieson, Sophomore at West Valley High School, West Valley School District
2. Mark Cheney, ESD 105, South Central Washington STEM Network Director
3. Mike Brown, ESD 105, Regional Science Coordinator and South Central WA LASER Director

Jackson is a sophomore at West Valley High School. He's currently taking College in the High School Pre-Calculus, and College in the High School Chemistry. He aspires to be a sound or production engineer with the ultimate goal of using those skills in a creative environment such as movies or filmmaking. He's also thoroughly enjoyed his Principles of Biomedical science course and looks forward to AP Physics and CHS Calculus next fall.

Mark D. Cheney

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CAREER EXPERIENCE

Educational Service District 105, Yakima, WA

September 2008-Present

- Co-Director, South Central Career Connect Project – January 2018-Present
- Director South Central WA STEM Network - 2015-Present
- Director South Central WA STEM Network (.5) and HU105 Teaching Faculty - 2015-2016 (.5)
- Co-Director, HU105 Teacher Preparation Project - September 2010-2015
- Director, North Central Washington LASER Alliance/Regional Science Coordinator - September 2008-August 2010

Washington State Leadership and Assistance for Science Education Reform (LASER), Seattle, WA

July 2007-August 2008

- Technical and Program Assistance Manager

Yakima School District, Yakima, WA

August 1994-June 2007

- Instructional Coordinator of Math and Science - July 2006-June 2007
- Grant Coordinator, LENS Math Science Partnership - July 2006-June 2007
- District Coordinator, National Science Foundation Science Writing Grant - July 2006-June 2007
- District Coach, National Academy for Curriculum Leadership – June 2004-June 2007
- Co-Director, South Central Washington LASER Alliance – June 2003-July 2007
- District Science Specialist – June 2000-July 2006
- 7th Grade Classroom Teacher, Math/Science – August 1994-June 2000

S.C. Enterprises Landscape Design, Yakima, WA

May 1979-July 1994

- Owner/Manager

EDUCATION

City University, Bellevue, WA 1998 - 2000

- MA Educational Technology, September 2000

Central Washington University, Ellensburg, WA 1987 - 1990

- Bachelor of Arts in Education, June 1990

Yakima Valley Community College, Yakima, WA 1979 - 1982

- Associate of Arts and Science, March 1982
- Associate of Business, December 1981

CERTIFICATIONS

Professional Teacher Certificate, Washington

- Elementary Education (K-8)
- Instructional Technology (4-12)

PROFESSIONAL EXPERIENCE

Career Connected Learning Design Team (Washington STEM) March 2016-present

Advisory Board, Engineering Fellows Project (University of Washington, Washington MESA) – January 2016-present

Chairman, Materials Science Advisory Board (CTE) 2015-present

Advisory Board, Success at the Core (Vulcan Productions) – November 2008-May 2011

Regional Team Leader, Science Partnership Academy (Washington State LASER) – December 2009-April 2011

Curriculum Consultant, Carolina Biological Supply Company - September 2000-July 2010

Master Trainer, Educational Service District 105 Science Education Cooperative – June 2000-July 2010

National Facilitator, BSCS Analyzing Instructional Materials (AIM) – May 2005-July 2010

Advisory Committee, OSPI Science Instructional Materials Review Rubric Development Group – March 2009-May 2009

Review Team Member, OSPI Science Instructional Materials Review Team – May 2009

Team Leader, BSCS National Academy for Curriculum Leadership – August 2005-May 2008

Steering Committee, Washington State LASER – May 2001-July 2007

Institute Faculty, Washington State LASER Strategic Planning Institute – July 2000-July 2007

Professional Development Facilitator, National Science Resources Center – July 2004-July 2007

Team Member, Educational Service District 105 Science Leadership Team – September 1998-June 2007

Author/Editor, Washington State LASER Professional Development Manual Project – May 2003-September 2006

Advisory Committee, STC Curriculum Revision Project (Smithsonian Science Education Center) – June 2002-August 2006

Institute Faculty, National Middle School Science Education Strategic Planning Symposium (Smithsonian Science Education Center) – July 2006

Development Team, OSPI Washington State Professional Development Guidelines – May 2005-August 2006

Author/Editor, Statewide Assessment Project for Hands-On, Inquiry-Based Science (Pacific Northwest National Laboratory) – June 2000-August 2002

Field Test Coordinator, Science and Technology Concepts/Middle School National Field Test (National Science Resources Center) – August 2000-June 2001

Committee Member, Yakima School District Science Adoption Committee – June 1999-May 2001

Committee Member, Yakima School District Title 1 Reading Committee – August 1994-May 2000

District Trainer, First Steps in Reading – September 1994-June 2000

CONFERENCES/PROFESSIONAL PRESENTATIONS

April 2012 National Science Teachers Association Conference, Indianapolis, IN – *Moving Towards Inquiry: Managing Change in Your District*

April 2012 Professional Educators Standards Board Conference, Seattle, WA – *Heritage University and Educational Service District 105 Collaborative: An Entirely New Model of Integrated Initial Teacher Preparation*

Feb. 2011 North Central Washington Educational Service District Science Leadership Network, Wenatchee, WA – *How Do You Know They Learned?*

Nov. 2011 National Science Teachers Association Conference, New Orleans, LA – *Implementing STEM in Your Classroom with Carolina Curriculum and the Smithsonian Institution*

April 2011 Professional Educators Standards Board Conference, Seattle, WA – *Heritage University and Educational Service District 105: The HU105 Project*

- Aug. 2011 Northern New Mexico Inquiry Science Education Consortium, Los Alamos, NM – *Teaching Hands-On, Inquiry-Based Science through the Ecosystems Curriculum Unit*
- Dec. 2011 National Science Teachers Association Conference, Seattle, WA – *Implementing STEM in Your Classroom with Carolina Curriculum and the Smithsonian Institution*
- Aug. 2010 Northern New Mexico Inquiry Science Education Consortium, Los Alamos, NM – *Teaching Inquiry-Based Science through Science Notebooks and the Land and Water Curriculum Unit*
- Aug. 2008 Alaska Gateway School District, Tok, AK – Differentiated Instruction in the Inquiry-Based Science Classroom
- Jan. 2007 Washington State LASER Instructional Materials Showcase, Seattle, WA – *Inquiry and the STC Science Curriculum K-5*
- July 2000-July 2007 Washington State LASER Strategic Planning Institute, Seattle, WA:
- *Becoming Novice Users of Inquiry Science Curricula*
 - *Introduction to Research-Based K-12 Science Instructional Materials*
 - *Demystifying Elementary Science Instruction*
 - *What is a Regional Alliance?*
 - *Providing Science Materials Support through a Science Refurbishment Center*
- Oct. 2007 Educational Service District 101 Principals Symposium, Spokane, WA – *Constructivist Learning in the Science Classroom*
- March 2006 National Science Teachers Association Conference, Anaheim, CA – *Exploring Energy, Machines, and Motion (STC/MS)*
- Dec. 2006 National Science Resources Center National Middle School Institute, Birmingham, AL – *Exploring Effective Professional Development*
- Oct. 2005 Washington Science Teachers Association Conference, Wenatchee, WA – *Connecting Science and Literacy through the use of Science Notebooks*
- Jan. 2004 Washington State LASER Curriculum Showcase, Spokane, WA – *Teaching Inquiry-Based Science using Electrical Energy and Circuit Design*

PROFESSIONAL ACTIVITIES AND MEMBERSHIPS

Member of the Association of Supervision and Curriculum Development

Member of the Washington Association of Supervision and Curriculum Development

Member of the National Science Teachers Association

Member of the Washington Science Teachers Association

Michael L. Brown
70 Reynolds Lane
Selah, Washington

Professional Preparation

Biology Education Bachelor of Arts, 1983 – Central Washington University

Appointments

2008 to present - South Central Washington State LASER Alliance Director
2008 to present - Regional Science Coordinator, ESD 105
2007 to 2010 - National Academy for Curriculum Leadership Faculty
2006 to 2008 - South Central Washington State LASER Alliance Co-Director
2003 to 2006 - Science Teacher Leader for Selah School District
1984 to 2006 - Science Teacher, Selah School District

Publications

Washington Regional Science Coordinators: Georgia Boatman, Mike Brown, Mark Cheney, Craig Gabler, Jon Hanson, Kirk Robbins, Jeff Ryan, Adrienne Somera, and Mark Watrin; Educated Opinions - Refining Our Focus, January 19, 2011 NSTA Reports

Synergistic Activities

1. Collaborating with other Washington State ESD Regional Science Coordinators to research, design, and deliver professional development for Washington teachers to improve science instruction.
2. Collaborated with the Smithsonian Science Education Center as a Project Advisor to develop and refine the Smithsonian Science for the Classroom – How Can We Protect Animals When Their Habitat Changes? unit of instruction for 3rd Grade students.
3. Participating in the review of the Next Generation Science Standards and the design and delivery of professional development to implement them in 2013.
4. Serving as a member of the South Central Washington STEM Core Leadership Team. This work includes community outreach and planning to launch a system of support for STEM education in South Central Washington.
5. Developed foundational professional development for teachers implementing BSCS - An Inquiry Approach instructional materials in the ESD 105 region. Trainers for this professional development were recruited from the cohort of teachers that participated in the BSCS research project: *Measuring the Effectiveness of Curriculum Materials for High School Multidisciplinary Science*.
6. Served as a faculty member for the National Academy for Curriculum Leadership (NACL). NACL is a partnership between Biological Science Curriculum Study (BSCS) Center for Professional Development and Washington State Leadership and Assistance for Science Education reform (LASER). The mission of NACL is to assist schools and districts in building the capacity to design, implement, and sustain effective high school science education programs using inquiry-based instructional materials that address National Science Education Standards.
7. Managed and coordinated Year 3 of the LENS Math-Science Partnership grant to provide professional development focusing on science and math content enrichment and pedagogy.
8. Participated in state-level science work (e.g. Washington State K-12 Science Learning Standards revision and development, Science Instructional Materials Scale development, Science Supplemental Instructional Materials Review, Science Assessment Leadership Team, Washington State LASER Middle School Curricular Materials Alignment with the 2010 Washington State Science Learning Standards)

9. Managed and coordinated a grant from Washington State LASER to provide foundational professional development to support the implementation of standards-based inquiry-centered instructional materials to K-8 teachers and administrators from 25 school districts and 2 private schools in the Educational School District 105 region.
10. Managed and coordinated a grant from Washington State LASER to develop science professional development providers from teacher leaders in the ESD 105 region.
11. Led Selah School District to adopt K-5 instructional materials and become a member of the ESD 105 Science Education cooperative. Led Selah science educator teams to the WA LASER Science Strategic Planning Institute and the National Academy for Curriculum Leadership.

Collaborators and Colleagues

Mark Cheney, South Central Washington STEM Network Coordinator

Kristen Johansen, Selah School District Science/STEM Facilitator

Mechelle LaLanne, Regional Science Coordinator, North Central ESD

Georgia Boatman, Regional Science Coordinator, ESD 123

Scott Killough, Regional Science Coordinator, ESD 113

Tammy Schrader, Regional Science Coordinator, ESD 101

Cheryl Lydon, Regional Science Coordinator, Puget Sound ESD

Jeff Ryan, Regional Science Coordinator, ESD 114

Brian McNevin, Regional Science Coordinator, Northwest ESD 189

Stacy Meyer, Regional Science Coordinator, ESD 112

Ellen Ebert, Science Director for Teaching and Learning, OSPI

Amber McCulloch K-12 Science Specialist, Teaching & Learning, OSPI

Rochelle Gandour-Rood Program Supervisor, Education for Environment and Sustainability

Dr. Jacob Clark Blickenstaff, Director of K-12 Engagement and Washington State LASER Co-Director

Dr. Peggy Willcuts, Battelle Pacific Northwest Laboratory, South East LASER Alliance Co-Director

Dr. Martha Kurtz, Director of the Center for Excellence in Science and Mathematics Education, Central Washington University

State Board of Education Meeting

May, 2018

Job Descriptions:

The work of the ESD 105 Regional Science Coordinator

1. Provide professional learning experiences for K-12 educators to broaden/deepen their existing knowledge of one or more of the following:
 - a. WSSLS/NGSS
 - b. Research-Based Instructional Practices
 - c. Equity (Instructional Practices for Diverse Student Populations)
 - d. Assessment
 - e. Professional Collaboration (Sharing with Colleagues)
2. Collaborate with other Regional Science Coordinators in the state to advocate for effective implementation of the WSSLS/NGSS to include:
 - a. Basic understanding of the architecture and organization of the NGSS
 - b. The translation of their knowledge of NGSS into aligned teaching, learning and assessment.
3. Support Washington State Science Fellows as they collaborate with building or district administration to develop an action plan to implement NGSS in their classroom, building, or district.
4. Provide professional learning to support Washington State Science Fellows to facilitate adult learning of the Washington State Learning Standards and Instructional Practices within their district/building.
5. Collaborate with other ESD 105 coordinators in a coherent effort to support STEM teaching and learning.
6. Advocate for research-based effective science instruction as described in the NGSS.
7. Provide technical assistance to teachers/districts as they implement effective science instruction.

The work of the South Central LASER Alliance Director

1. Utilize the LASER Theory of Action to sustain a K-5 Cooperative that supports Science/STEM teaching and learning:
 - Operate an efficient Regional Material Support Center to refurbish the Cooperative's instructional materials.
 - Sustain a network of administrative and community to support the Cooperative.
 - Develop a cadre of Master Science Trainers to provide professional learning to teachers as they implement new instructional materials.
 - Continuous evaluation of all elements of the Cooperative program.
2. Collaborate with other LASER Alliance Directors to:
 - Design K-5 curriculum programs.
 - Develop Master Science Trainers.
 - Redesign professional development models to incorporate digital online learning.
3. Provide targeted professional development related to the effective implementation of science instructional materials for teachers in grades 6-12.
4. Collaborate with the South Central Washington STEM Network Director to:
 - Support the Goals and work of the STEM Network.
 - Integrate principles of STEM teaching and learning into the professional learning experiences of K-12 educators.
 - Develop and sustain community support through the private sector's STEM employers for the K-5 Science Education Cooperative.
 - Advocate for the importance of providing equitable access to a high quality STEM education for all the students of South Central Washington.

The work of the South Central Washington STEM Network Director

5. Coordinate the implementation of the South Central Washington STEM Network Business Plan.
 - Establish and Support STEM–Based Educational Experiences PreK-20 that Ensure Students Graduate From High School STEM Literate and College/Career Ready.
 - Develop strong partnerships between the business and education communities to ensure all students in South Central Washington become STEM literate and Career/College Ready.
 - Implement a STEM Communication/Advocacy Plan to ensure that the greater community of South Central Washington develop/deepen their understanding of STEM and STEM literacy, and the relationship to the economic prosperity of the region.

6. Collaborate with the ESD 105 Regional Science Coordinator/LASER Alliance Director to:
 - Establish and sustain a material support system for the ESD 105 Science Education Cooperative.
 - Support the implementation of the STEM Curriculum Program of the ESD 105 Science Education Cooperative.
 - Provide professional development and classroom-based support related to the effective implementation of the Next Generation Science Standards.
 - Serve as a conduit between the business and education communities to provide ongoing financial support of the work of the ESD 105 Science Education Cooperative and the work of the Regional Science Coordinator.
 - Engage STEM professionals and classroom teachers in the development and implementation of authentic engineering design challenges that are relevant to the students of the region.
 - Advocate for the importance of providing equitable access to a high quality STEM education for all the students of South Central Washington.

7. Collaborate with the ESD 105 Regional Math Coordinator to:
 - Advocate for the importance of providing equitable access to a high-quality STEM education for all the students of South Central Washington.
 - Support the efforts of the Early Math Coalition.
 - Deliver professional development related to research-based, high-quality math instruction and STEM literacy.

8. Collaborate with the ESD 105 Regional Computer Science Coordinator to:
 - Establish and sustain a system of ongoing financial support for the coordination of computer science efforts in the region (establish the ESD 105 Computer Science Cooperative, grants, foundations, etc.).
 - Advocate for the importance of providing equitable access to a high quality computer science education for all the students of South Central Washington.
 - Develop business partnerships to develop and deliver high-quality computer science professional development.

9. Work with statewide organizations to advocate for STEM related policies and support systems.

10. Collaborate with the WorkForce Council, the Yakima County Development Association, higher education institutions, businesses, Career and Technical Education , ESD 105 coordinators, and

community organizations to develop and implement a continuum of high-quality Career Connected Learning experiences. (career fairs, career awareness events, job shadows, classroom presentations, mentorships, teacher externships, internships, apprenticeships, etc)

A Conversation with Mike Brown & Mark Cheney, ESD 105

1. What are your roles, responsibilities, authorities and accountabilities in these positions?
2. What distinguishes these three efforts from one other? What are the overlaps? How are overlaps managed?
3. What are the strengths, weaknesses, opportunities and threats (SWOT) vis-à-vis science/STEM education in South Central Washington based on these efforts?

Questions	Regional Science Coordinator	LASER Alliance Director	STEM Network Director
Roles?	<p>Provide regional support to K-12 educators to implement the WSSLS/NGSS</p> <p>Develop and deliver high quality professional development.</p> <p>Identify, recruit, and develop teacher leaders to support their district, the region, and the state in implementing effective science instruction.</p> <p>Collaborate with other ESD 105 coordinators in a coherent effort to support STEM teaching and learning.</p> <p>Collaborate with other Regional Science Coordinators in the state to advocate for effective implementation of the WSSLS/NGSS.</p> <p>Provide technical assistance to teachers/districts as they implement effective science instruction.</p>	<p>Sustain a K-5 Cooperative of regional school districts and private schools to provide standards-aligned science instruction.</p> <p>Identify, recruit, and develop teacher leaders to become Master Science trainers to provide foundational professional learning to classroom teachers in the first-use of instructional materials.</p> <p>Communicate with Science Cooperative District Coordinators to manage logistics related to instructional materials, i.e, Kit orders, pick up and delivery, living materials.</p>	<p>Develop authentic partnerships between the business and education communities to provide equitable access to a high-quality STEM education, and career pathways.</p> <p>Advocate for STEM education and career opportunities within the region and the state</p> <p>Collaborate with other ESD 105 coordinators to support STEM teaching and learning in the region.</p> <p>Collaborate with other STEM Network Directors in the state to share best practices in STEM education.</p> <p>Provide technical assistance to teachers/districts as they implement effective STEM related instruction.</p> <p>Partner with other STEM Network Directors, Washington MESA, businesses, the Governor’s Office, OSPI,</p>

	Advocate regionally and state-wide for research-based effective science instruction as described in the NGSS.		and other state organizations as members of the Washington STEM Policy Committee to advocate for STEM education and STEM career pathways.
Responsibilities	<p>Deliver professional learning and technical assistance to K-12 educators and Science Fellows to implement the WSSLS/NGSS.</p> <p>Attend meetings with other Regional Science Coordinators to develop goals and professional learning deliverables.</p> <p>Support initiatives and priorities of the Association of Educational Service Districts (AESD).</p> <p>Implement the annual Regional Science Coordinator goals.</p>	<p>Coordinate the operations of the K-5 Science Cooperative that include logistics, communication, and sustaining a cadre of Master Science Trainers.</p> <p>Manage the budget for Washington LASER Grant.</p> <p>Provide technical support to the Cooperative's Executive Committee.</p>	<p>Coordinate the implementation of the South Central Washington STEM Network Business Plan.</p> <p>Secure the resources necessary to support the implementation of the South Central Washington STEM Network Business Plan.</p> <p>Provide technical assistance to districts in the South Central Washington region as they develop and implement STEM strategic plans.</p> <p>Work with the South Central Workforce Council to implement the South Central Career Connect Grant.</p> <p>manage the execution of the Washington STEM Implementation Grant.</p> <p>Actively participate as a member of the Washington STEM Policy Committee to develop and advocate for STEM legislative priorities.</p>
Authorities?	Determine the content of professional learning for K-12 educators based on state and regional contexts and critical issues.	Make decisions about professional learning events and science unit logistics for K-5 (see above Responsibilities)	Determine the most effective means to implement the goals of the South Central Washington STEM Network.

	(see above Responsibilities)		Work with the South Central Workforce Council to implement the scope of work detailed in the South Central Career Connect Grant.
Accountabilities?	I am accountable for the responsibilities detailed above.	I am accountable for the responsibilities detailed above..	I am accountable for the responsibilities detailed above.
Distinguishing Elements?	Emphasis on professional learning and technical assistance for WSSLS/NGSS for K-12 schools.	Focus is on K-5 schools for materials and professional learning. Grade 6-12 classrooms are supported by professional learning.	The development of authentic partnerships between the business and education communities. Work with the business community, Yakima County Development Association, Workforce Council, Career and Technical Education, higher education institutions, and state organizations to develop and offer high-quality Career Connected
Overlaps?	Support Goal 1 of the STEM Business plan. WSSLS/NGSS professional learning is integrated into the transition of the K-12 Science Cooperative to these new standards. STEM Career pathways will integrate into future professional learning events.	Collaborate with the STEM Network Coordinator to identify and adopt “place-based” instructional materials that showcase STEM careers for the K-5 Science Cooperative Curriculum Program.	Goal 1 of the STEM Business Plan identifies K-12 Science Education as an area of focus. Specifically supporting the implementation of the NGSS and the sustainability of the ESD 105 Science Education Cooperative. In addition The STEM Network works in collaboration with the Regional Science Coordinator and LASER Alliance Director to secure necessary resources to support the adoption and implementation of NGSS aligned instructional materials. The STEM

			Network also supports the Regional Science Coordinator in providing professional development related to Career Connected Learning.
How overlaps managed?	<p>Overlaps are considered strengths by all. All roles are informed by a common mission and vision that originated from involvement with Washington LASER.</p> <p>The personnel described in these roles are housed in the same facility, Proximity is conducive to collegial and collaborative relationships that lead to creative solutions for regional needs.</p>	Same as Regional Science Coordinator.	The overlaps provide a synergistic opportunity for the STEM Network and Regional Science Coordinator to develop and deliver high-quality professional development. The overlaps also allows both the STEM Network Director and Regional Science Coordinator/LASER Alliance Director to work within their own individual areas of strength and responsibility for the benefit of students in the region(i.e. the STEM Network Director facilitates the engagement of the business community to provide classroom support related to Career Connected Learning).
Strengths in SC-WA?	<p>ESD 105 is respected and valued by schools and school districts in the region.</p> <p>A high number of K-12 educators have experienced science professional learning offered by ESD 105 and/or are PD Providers and leaders.</p> <p>The Regional Science Coordinator mentors Science Fellows nominated by schools and districts to develop</p>	<p>Nearly all school districts in SC-WA have been members of the Science Cooperative managed by ESD 105 since 2001. The Science Cooperative has fostered a culture of district collaboration, including administrative and community support for Science and STEM.</p> <p>Seventeen districts have collaborated to support YV-Tech, a</p>	Because the STEM Network is based out of Educational Service District 105, the Network benefits from the reputation of the ESD as providing high-quality services and support to the 25 school districts in the region. In addition the STEM Network Director and Regional Science Coordinator/LASER Alliance Director have a long standing relationship dating back to their childhood. This

	<p>action plans for NGSS implementation.</p>	<p>facility that houses STEM courses for high school students.</p> <p>Master Science Trainers have been recruited from Science Cooperative member districts to provide professional learning and create resources that support the implementation of regional curricula.</p>	<p>relationship of trust and collaboration provides the foundation for the development of high quality products and services. This example of collaborative relationship has created a culture that has allowed other ESD coordinators (math, computer science, migrant education, etc.) to engage in the collaborative work in the region.</p> <p>Because the leadership of the STEM Network and LASER Alliance have worked in the ESD 105 region for three decades or more, they have developed long standing relationships with leaders in the business and education communities. These relationships of mutual trust and respect provide the opportunity for authentic partnership and collaboration.</p>
<p>Weaknesses in SC-WA?</p>	<p>Schools and districts are tasked with mitigating the issues of poverty and language acquisition. These critical issues are challenges for equitable science teaching and learning.</p> <p>The Regional Science supports the few Informal Education providers in South Central Washington with NGSS professional learning and advocacy for their programs.</p> <p>There is a need to develop STEM Pathway professional learning in</p>	<p>There is a significant rate of teacher mobility in districts and schools with significant rates of poverty and EL students. This is a challenge to sustain effective science teaching and learning.</p> <p>There is a need to support equity in STEM pathways in all school districts.</p> <p>While there are emerging models in the region, the majority of students do not have access to</p>	<p>Because of the rural nature of the region, many districts are located a great distance from the STEM Network/Educational Service District. Providing equitable access to high-quality STEM experiences or professional development is a challenge.</p> <p>Many of the rural communities in the region are comprised of poor and underserved student populations. Overcoming the barriers presented by poverty, language acquisition, and make up</p>

	<p>concert with OSPI and the STEM Network for K-12 educators.</p>	<p>these STEM Career Pathways.</p>	<p>of the family structure are additional barriers.</p> <p>The STEM industries in the region (agricultural, aerospace, health care, etc.) find it difficult to hire highly qualified workers who are prepared to move seamlessly from the K-12 education system to the jobs of today.</p> <p>Historically school districts in the South Central Washington region have a limited tax base and have difficulty constructing school facilities that provide equitable access to STEM learning experiences (i.e. computer science, technology including 3-D printing, machine shops with equipment that is current with industry standards, etc.).</p>
<p>Opportunities in SC-WA?</p>	<p>Schools and districts recognize the importance of Science and STEM teaching and learning for their students and communities.</p>	<p>Small Schools and districts have discovered the benefit of joining the Science Cooperative.</p> <p>The Cooperative has two new members since Fall 2017.</p>	<p>Authentic partnerships exist and are emerging between the STEM Network, the WorkForce Council, the Yakima County Development Association, local businesses and education to provide high-quality STEM related experiences and career pathways for the students in South Central Washington. The agricultural industry is changing rapidly and will provide an increasing number of family wage STEM jobs.</p> <p>The STEM Network in partnership with the Workforce Council has received funding to provide increased access</p>

			<p>to internships, apprenticeships, and other Career Connected Learning experiences.</p> <p>The South Central Career Connect Grant is providing resources to write a playbook to develop apprenticeships partnering local school districts and businesses.</p> <p>Career and Technical Directors in the region are partnering with the STEM Network and business community to develop career pathways for students.</p> <p>Higher education partners are eager to partner with the STEM Network to provide equitable access to STEM career pathways.</p>
<p>Threats in SC-WA?</p>	<p>There is a shortage of Science teachers and substitutes.</p> <p>ESD 105 programs are dependent on grants or “fee for service”. This soft funding is a challenge to sustaining services offered in the region.</p>	<p>The work of the LASER Alliance Director is funded with ESD 105’s allocation to compensate a Regional Science Coordinator</p> <p>The lack of substitutes has constrained access to face to face professional learning.</p> <p>Districts are asking for digital learning resources that are less engaging and of dubious effectiveness.</p>	<p>Current funding for the coordination of the STEM Network is pieced together from grants and foundations. A sustainable funding structure is needed.</p>



THE WASHINGTON STATE BOARD OF EDUCATION

A high-quality education system that prepares all students for college, career, and life.

Background Information on ESD, LASER and WA STEM efforts related to improving science and STEM education in Washington State (including emerging WSSLS/NGSS efforts).

Note: All text comes directly from ESD, LASER and WA STEM websites.

Educational Service District (ESD) Science Coordinators and the Washington State Leadership and Assistance for Science Education Reform (LASER) Project

ESDs

Stronger together, the nine ESDs are united in a shared goal – to help all students succeed.

While our partnership with OSPI to deliver statewide initiatives is primary, the success of the ESD network is dependent upon relationships and responsiveness at the local level. Each ESD builds innovative programs and services that meet the unique needs of schools and communities in its region of the state. ESDs offer local support such as district business management, technology support, communications support, drop-out prevention, after-school programs, personnel cooperatives, early learning and parent resources based on regional needs. We are committed to creating quality instructional and operational programs that support large and small school districts in both urban and rural settings.

ESD Services - Math, Science and STEM Coordination and Training

ESDs improve math and science instruction by providing equitable access to technical assistance and quality professional development. Current research confirms teaching practices aligned to math and science standards increase content knowledge among students. Algebra, geometry and biology students of teachers who participated in professional development demonstrated higher levels of achievement. Continued funding will sustain this comprehensive, coherent system of improving math and science performance. Links to individual science coordinators and descriptions of ESD efforts in science and STEM are found below.

- <http://www.k12.wa.us/Science/ESDcontacts.aspx>
- <https://www.esd101.net/csi>
- <https://www.esd105.org/domain/47>
- <https://www.esd112.org/stem-initiatives/regional-science-services/>
- <https://www.esd113.org/Page/2457>
- <https://www.oesd114.org/stem>
- <https://www.waesd.org/news/regional-news/esd-121-puget-sound/>
- http://www.esd123.org/programs_services/curriculum_content
- <http://www.ncesd.org/news/service/science/>
- <https://www.nwesd.org/science>

Leadership and Assistance for Science Education Reform (LASER) Project

The LASER Project is dedicated to helping school districts with their efforts to implement the Washington State Science Learning Standards (aka NGSS) as well as their efforts to mature and sustain a high-quality science program based on those standards. LASER uses a nationally validated theory of action and improvement model, developed by the Smithsonian Science Education Center, to assist educators (i.e., teachers and administrators) as well as community stakeholders to:

1. Build their knowledge of current research and best practices,
2. Develop a shared vision and set of common goals,
3. Design, implement and sustain a school district infrastructure for ongoing support,
4. Continuously improve instructional practices, and
5. Focus on increasing student learning and achievement for all students.

Current Funding Context - The Office of the Superintendent of Public Instruction (OSPI) provides funding for Washington State LASER. Prior to 2017, the Pacific Science Center acted as the fiscal agent for LASER funding. In 2017 PSC contracted with WA STEM to carry out this function. Funds are distributed directly to LASER Alliances through our state's Educational Service Districts (ESDs), with the exception of the North Sound LASER Alliance where the Institute for Systems Biology (ISB) acts as fiscal agent. At this time, it is anticipated that WA STEM will receive LASER funding directly from OSPI beginning in July 2018. WA STEM, the ESDs and LASER Alliance Directors are currently meeting to determine that path forward for LASER.

Below are brief descriptions of the efforts by each LASER Alliance that describe the geographical scope of science education efforts, which are focused on WSSLS/NGSS implementation and the sustainability of high-quality science education.

1. **NE LASER Alliance/NEWESD 101** - NEWESD 101 is the largest, geographically, of the nine ESD regions in Washington. There is vast diversity in size and geographic isolation among districts. Northeast Washington Educational Service District 101 and 29 school districts have formed the Northeast Washington LASER Alliance to support K-12 science education in the NEWESD 101 region.
2. **SC LASER Alliance/ESD 105** - The South Central Washington LASER Alliance partners 23 school districts and 3 private schools in a common K-5 science curriculum program through membership in the ESD 105 Science Education Cooperative. The ESD 105 Science Education Cooperative utilizes a cadre of Master Teacher Trainers to deliver foundational professional development to the member's K-5 teachers. These teachers receive science instructional units/kits in a ready to teach condition after being refurbished at the Science Materials Center operated by ESD 105. A total of 3,000+ science unit/kits are taught in regional classrooms each year.
3. **SW LASER Alliance/ESD 112** - The Southwest Washington LASER Alliance serves 30 school districts and five private schools in six counties across Southwest Washington. Our Alliance focuses on equitable access to science and STEM education for all students, and provides instructional materials, equipment loans, professional development and technical assistance to teachers and administrators. Alliance co-directors, Vickei Hrdina and Stacy Meyer, collaborate with multiple agencies throughout the region to build a robust and diverse community of experts and leaders to inform Alliance planning. Our partnership with the SW WA

STEM Network also supports integration of career-related learning for students and teacher externships to increase awareness of STEM opportunities in our regional economy. Our partner districts are currently working through a STEM Strategic Planning process that will result in a five-year action plan for implementing the NGSS and integrating STEM from preschool to graduation across their district.

4. **Mountain to Harbor LASER Alliance/ESD 113** - The Mountain to Harbor (M2H) LASER Alliance region coincides with the boundaries of ESD 113, running from White Pass in Lewis County to the Pacific Ocean, taking in Thurston, Mason, Grays Harbor and Pacific Counties. The alliance strives to serve our 45 districts with high quality, equitable, and engaging professional development.
5. **Olympic LASER Alliance/ESD 114** - The Olympic Peninsula Washington LASER Alliance is a cooperative organization of regional school districts. Its purpose is to provide a cost-effective curriculum support system along with an appropriate level of professional development support in order to foster the development of science education systems within school districts and throughout the region.
6. **South Sound LASER Alliance (SSLA)** – SSLA operates as a network of school district leaders with three codirectors who share the leadership and organizational duties of the Alliance Director role. SSLA has met monthly for well over ten years to engage in shared learning that supports our common interests around science education reform. Since 2013 we have centered on implementing the high-leverage innovations of the Next Generation Science Standards. Since 2015, SSLA has operated with an explicit focus on equity. That is, we want to change instructional practices and school/district structures that contribute to the historically inequitable access to STEM-related careers. We have about 11 districts that attend regularly, but our meetings are also occasionally attended by leaders from other districts, Puget Sound ESD (PSESD), North Sound LASER Alliance (NSLA), and community-based organizations who have shared interests. This crossover attendance is a reciprocal arrangement for many SSLA members. SSLA uses its network to develop teacher and leadership professional development that builds the capacity of people and systems in our region.
7. **North Sound LASER Alliance/Institute for Systems Biology** - The North Sound LASER Alliance (NSLA) is coordinated by the Institute for Systems Biology's Logan Center for Education. The NSLA formally encompasses school districts in King County but is welcoming to other districts across the greater Puget Sound region. The districts that comprise the NSLA are large and small, urban and rural, and comprise a significant percentage of the State's student population. While each NSLA district is at a different stage in the process, each is working to transition to full implementation of the Next Generation Science Standards (NGSS). NSLA activities support districts in identifying and addressing system-wide components of a strategic transition plan such as the science professional learning needed by teachers and administrators or adaptation strategies to move current curriculum to a NGSS framework. The NSLA region is home to districts with diverse contexts. Therefore, rather than providing common, regional professional development for educators, the NSLA supports job-alike networks to address the contemporary issues in science education. Specifically, the NSLA facilitates a network of school district science coaches (or TOSAs – teachers on special assignment). The Science TOSA Network meets quarterly to work on common problems of practice and to share resources coaches can employ in support of classroom science teachers. Additionally, the NSLA periodically hosts cross-district events, known as Networking Forums. These forums convene school district teams (comprised of administrators, teachers and community members) to develop/enhance district-wide strategic plans related to science and STEM education.

8. **SE LASER Alliance/ESD 123** - ESD 123 serves 21 of our 23 school districts and three private schools in SE Washington through the SE LASER Alliance. The SE LASER Alliance Board meets to plan and collaborate in a unique effort to ensure that the entire region has equitable access to quality science materials and instruction. Our focus is to provide high quality instructional materials, best practices professional learning experiences around those materials and the Washington State Science Learning standards, and support for administrators to fully implement Science/STEM in their schools and districts so that all K-8 students participate in a developmentally appropriate, inquiry-based science program that uses a teaching/learning model that parallels the way scientists and engineers uncover knowledge and solve problems.
9. **NC LASER Alliance/NCESD 171** – North Central Washington is a region comprised of twenty-nine school districts ranging geographically from Oroville on the Canadian Border to Wilson Creek in the center of the state, from the Bavarian mountains of Leavenworth on the western edge to the high desert of Grand Coulee Dam to the East. In service of these many rural and remote district, the North Central STEM Cooperative provides STEM materials to twenty-three districts.
10. **Northwest LASER Alliance/ESD 189** – Northwest LASER serves the five most northwestern counties in WA State: Snohomish, Skagit, Whatcom, Island and San Juan counties. Twenty-one school districts are members.

Washington STEM Regional Networks - In addition to currently funding the Washington State LASER Project, WA STEM has also established a set of STEM regional networks, some of which are led by ESDs. Below are descriptions of the regional networks as found on WA STEM's website (March 2018). *Watch a five minute video to learn more about Washington STEM's work across Washington [here](#).*

Our STEM Networks are creating unified systems of STEM education in their own communities – fostering partnerships, eliminating the duplication of work, and increasing impact. Washington STEM's role in this process is to create a network of networks that spreads best practices among communities and drives the scaling of effective practices across the state.

1. The ***Apple STEM Network*** is a three-dimensional alliance of K-12, Higher Ed and community partners seeded at the confluence of the Wenatchee and Columbia rivers, including the cities of Cashmere, Wenatchee and East Wenatchee in Chelan and Douglas counties. We represent a diverse region with tremendous potential for STEM industry in agriculture, energies and innovation. With our collective efforts we intend to: provide a constructive support system for educators who aim to meet the rising challenge for all students to develop 21st century skills and STEM literacy, to integrate community mentorship and promote authentic project-based learning and field experiences for all levels of education and engage students in exploring the world of opportunities on the horizon through STEM.
2. The ***Capital Region STEAM Network*** was established in 2017 by the Regional Alliance for Youth (RALLY) whose mission it is to “rally communities to nurture our children and youth from cradle to career.” RALLY has organized school, business and community organizations interested in enhancing career readiness and STEM learning opportunities in the region consisting of Grays Harbor, Lewis, Mason, Pacific and Thurston counties. The goal of our new Capital Region STEAM Network is to have a business plan in place

that identifies our priorities and implementation strategies by the start of the 2017-2018 school year.

3. **Mid-Columbia STEM Network** - The Mid-Columbia region is at the confluence of the Columbia, Snake, and Yakima rivers in southeastern Washington. The area economy is fueled chiefly by agriculture, technology, manufacturing and government agencies. Mid-Columbia became the home of the world's first full-scale nuclear reactor during World War II and now claims the world's fastest production car. In 2011, the region was named "11th Geekiest City in the US" by Forbes magazine, based on the percentage of workers with STEM jobs.
4. **Skagit STEM Network** – Thanks to our passion for innovation, excellence and education, Skagit has been a leader in world-changing technology for more than a century. With global companies such as the Skagit Corporation, Snelson, Rothenbuhler and Janicki Industries, Skagit is home to the world's leaders in composites, remote detonation and other innovations. A key industry in Skagit is sanitation technology, thanks to the Janicki Omni Processor, a machine backed by the Bill and Melinda Gates Foundation that turns sewage and sludge into drinking water. And thanks to our commitment to educational excellence and preparing our children for exciting careers in innovation, the future of Sedro-Woolley is even brighter. Our mission is to provide resources and a collaborative environment for educators, administrators, and community-based organizations that better enable them to help the students of Skagit acquire the knowledge and skills required to meet the challenges of the 21st century. Our vision is that all learners will acquire the knowledge, skills and experiences that will carry forward Skagit's century long tradition of innovation, excellence, and hard work into the future.
5. **Snohomish STEM Network** - The goal of the Snohomish STEM Network is to leverage the talent and assets in the county in a collective manner to support and grow the STEM workforce in Snohomish County.
6. The **South Central STEM Network** spans Yakima and Kittitas counties and parts of Klickitat and Grant counties, as well as several school districts located on the Yakama Nation Reservation. The region has rapidly changing business and industry needs, including growing activity in renewable energy, healthcare, manufacturing, and a rich agricultural community. The network will bring to light the many career opportunities available, preparing its diverse students for family wage-earning jobs in the area, and bolster communities' ability to strengthen their local economies and play a larger role in the global economy. Our goals include: 1) Assist students to develop the critical reasoning and problem solving skills that will make them the most productive in the world; 2) Create an environment where the private sector and business community collaborate to support STEM learning; 3) Strengthen human, financial, and physical resources available to local schools for STEM learning; 4) Increase the knowledge of and interest in STEM education and careers for all students so they can see themselves in the STEM workforce; and 5) Develop a strong STEM teacher workforce through effective teacher preparation and professional development.
7. Washington STEM coordinates **Seattle/King County STEM efforts**, working with key education, business, and community partners.
8. **Southwest Washington STEM Network** - Situated just north of Portland, Oregon, Southwest Washington has become a strong contributor to Washington's new economy, particularly in its contributions as a global leader in semiconductor manufacturing. The Southwest Washington STEM Network is focused on K-12 and post-secondary STEM

education to support the current and future growth of the region's STEM economy. The vision of the network is that all learners acquire the knowledge, skills, and experiences that will unlock futures, build a globally engaged community, ensure a prosperous economy, and inspire innovation throughout our region. Southwest Washington STEM Network represents four sectors: K-12 education, post-secondary education, business, and economic development. The combined membership of these organizations represents stakeholder groups — students, parents, teachers, leaders, employees, and employers — actively engaged in the national and local dialogue on STEM education and industry.

9. **Spokane STEM Network** - Spokane County is a regional, economic, and cultural hub for a four-state region with over 1.9 million people. The primary workforce sectors for the county are rooted in STEM: aerospace, clean technology, manufacturing, energy, technology, and health/life/biomedical sciences. Predictions show that by 2015, STEM jobs will grow twice as fast in the region as non-STEM jobs. To prepare for this future, the Spokane STEM Network needs to ensure all area students receive an excellent STEM education, while boosting post-secondary degree attainment in alignment with local workforce development needs.
10. **Tacoma STEAM Network** seeks to provide every young person with the opportunities to gain the appropriate skills, knowledge, and abilities to pursue a degree or certificate in a STEM field. Furthermore, Tacoma STEAM seeks to remove barriers of such opportunities to those students impacted by poverty and of color. For many years, organizations throughout Tacoma have worked to elevate the importance of STEM and all of the potential and progressive opportunities STEM could bring. From child care providers, to elementary school classrooms, to after school programs, summer programs, and high school clubs, Tacoma has already embedded the value of STEM education and training. With the development of a planning team to focus on a network that would work intentionally to spread awareness of STEM programmings in Tacoma, we believe Tacoma may be a powerful STEM community.
11. **West Sound STEM Network** - Despite the West Sound's remote, mostly rural location, much of our local economy is heavily dependent upon a STEM-skilled workforce. The presence of highly technical military-related facilities and the Puget Sound Naval Shipyard, combined with the historical natural resource based industries, predisposes the region a need to focus on STEM. Puget Sound's urban center, filled with rich STEM opportunities, is a commutable distance thanks to ferries and a bridge. Our community has the potential to provide many STEM opportunities and resources to schools, but has unique constraints that make it more challenging to interface with schools. The West Sound STEM network will act as a hub that effectively connects schools with the STEM community, allowing for efficient and equitable use of local resources for the benefit of all.