1. APPLICATION COVER PAGE

(Please Print or Type – All Fields Must Be Completed)

Project Name: 21st Century Skills Project
Amount Requested: $236,648

Project Director: Tony Vicknair		
District, School or ESD: McMinnville School District		
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City: McMinnville	State: Oregon	Zip: 97128
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Grant Fiscal Agent Contact: Susan Escure		
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Superintendent: Dr. Maryalice Russell		
District or ESD: McMinnville School District		
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City: McMinnville	State: Oregon	Zip: 97128
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	Participating High School or Middle School Name (add additional rows as needed)	Lead Contact Name	Grade Levels	Student Enrollment
a)	McMinnville High School	Tony Vicknair	9th-12th	2,037
b)	Duniway Middle School	Cathy Carnahan	6th-8th	753
c)	Patton Middle School	Brian Crain	6th-8th	815
d)				
e)				

Please check all that apply:

X This project directly involves Career and Technical Student Organizations
Please note page of proposal that describes this relationship. Page: 7-23 and page 31

X This project has a clear connection to STEM
Please note page of proposal that describes this relationship. Page: 7-23

2. PROJECT OVERVIEW

Purpose and Scope of Project:

The 21st Century Skills Project, submitted by McMinnville School District, will revitalize McMinnville High School's Career/Technical Education (CTE) Program of Study in engineering, while also building a STEM pipeline of middle school students, utilizing recruitment strategies that will target traditionally underserved and underrepresented students. The project will feature the following core components:

1) A new Engineering and Manufacturing Career Pathway at McMinnville High School, offering dual high school/college credit, Certificate of Completion programs, and industry-based teaching and learning
2) New engineering coursework in 6th-8th grade, including coursework exclusively for girls, a STEM Summer Camp for Girls, a STEM Summer Camp for migrant students, and FIRST Tech Challenge teams
3) A new SkillsUSA chapter, a Career and Technical Student Organization, embedded in the Engineering and Manufacturing Career Pathway
4) New STEM-focused extended learning opportunities (afterschool, Business After Hours, Saturday Academies, and summer programs)

The 21st Century Skills Project will be implemented in collaboration with Portland Community College and local STEM industry partners. Project Objectives:

1) Increase student achievement and engagement in STEM
2) Increase college- and career-readiness
3) Develop and sustain collective impact partnerships that address a workforce imperative to prepare students for high-demand, high-wage STEM careers

SUPPORTING THE OVERALL REVITALIZATION EFFORT (40 Points)

Innovation (10 Points): The 21st Century Skills Project features innovative, research-based strategies designed to increase student achievement and narrow achievement gaps using CTE as an instructional delivery model, while significantly increasing the number of students engaged in STEM teaching and learning. Among the innovations the project will implement, are strategies designed to recruit and retain traditionally underserved students, through vibrant, hands-on STEM experiences in 6th-12th grade. The standards-based curriculum, instruction, and assessment that will be utilized in the project is built on a research-based framework of highly-effective problem- and project-based learning, including carefully calibrated project design and structured student collaboration: (1) Students will encounter and learn the central concepts of STEM disciplines via project-based learning; (2) Projects will be focused on real-world questions or problems that motivate students to encounter and struggle with the central concepts and principles of the disciplines; (3) Projects will engage students in constructive investigations involving design, decision-making, problem-finding, problem-solving, discovery, and model and product building; and, (4) Projects will be student-driven and will address authentic market needs (Darling-Hammond, 2008).

Students will experience all aspects of the local STEM economy by learning about engineering and manufacturing workforce needs, developing the knowledge and skill-sets to address those needs, and working side-by-side with industry mentors. Such an approach represents research-identified best practices in authentic performance tasks (Reeder, 2007).

Integration (10 Points): The 21st Century Skills Project integrates CTE and core academic content into a coherent approach that provides a clearly articulated pathway from 6th-12th grade and beyond, by implementing coursework that is directly linked to STEM postsecondary education and careers, including dual credit opportunities and Certificate of Completion programs (Appendix A: Career and College Linkage, p. 45-48). The project will leverage district and partner resources to strengthen and enhance STEM programs at both district middle schools and to create a new Engineering and Manufacturing Career Pathway at McMinnville High School. Pathway coursework is aligned with Common Core State Standards, state academic standards in engineering and design, industry-recognized technical standards and employability skills, and Oregon Diploma requirements. A Career and Technical Student Organization, SkillsUSA, will be embedded in the new Pathway. Middle school and high school STEM coursework will be thematically linked, sequentially building increasingly complex skill-sets, with interrelated outcomes and activities, utilizing a research-based approach to problem- and project-based learning. The project design is also integrated with the district's new STEM- and CTE-focused 21st Century Community Learning Center Project. Project coursework will be augmented with extended learning opportunities in which students will work side-by-side with industry mentors.

The project addresses a district, partner, and workforce imperative to prepare students for high-demand, high-wage STEM careers that exist in our community. The 21st Century Skills Project will be an essential component of the district's focus on achieving Oregon's 40/40/20 goal and building a pipeline of students excited about and prepared to pursue STEM postsecondary education and careers.

Expansion and Growth (10 Points): Table A documents growth and expansion.

Table A: Growth and Expansion	
Project Year	**Target**
2013/14	○ 10% increase in the number of 9th-12th grade students participating in STEM-focused extended learning activities ○ 200 students enrolled in middle school STEM coursework ○ 20% increase in enrollment of traditionally underserved students ○ 75 girls and 30 migrant students attend STEM summer camps
2014/15	○ 50 students (10th-12th grade) enrolled in Manufacturing Technology 1 and 2 ○ 10 students participate in industry-based apprenticeships, internships, and work-study placements ○ SkillsUSA chapter is launched and Pathway students participate ○ 400-plus students enrolled in middle school STEM coursework ○ 20% increase in the number of 9th-12th grade students participating in STEM-focused extended learning activities ○ 30% increase in enrollment of traditionally underserved students ○ 75 girls and 30 migrant students attend STEM summer camps
2015/16	○ 100 students enrolled in Manufacturing Technology 1-4 ○ 15% increase in the number of students participating in SkillsUSA ○ 15 students participate in industry-based apprenticeships, internships, and work-study placements and the student-run enterprise is launched ○ 50% of engineering and manufacturing coursework enrollment is traditionally underserved students ○ 400-plus students enrolled in middle school STEM coursework ○ 50% of middle school STEM coursework enrollment is traditionally underserved students ○ 75 girls and 30 migrant students attend STEM summer camps ○ Dissemination and district-provided support for replication of STEM components in other Yamhill County schools and districts
2016 and beyond	○ 150 students (10th-12th grade) enrolled in Manufacturing Technology1-4, Advanced Manufacturing, and Advanced Design ○ 15% increase in the number of students participating in SkillsUSA ○ 20 students participate in industry-based apprenticeships, internships, and work-study placements, and student-run enterprise ○ 60% of engineering and manufacturing coursework enrollment is traditionally underserved students ○ 400-plus students enrolled in middle school STEM coursework ○ 60% of middle school STEM coursework enrollment is traditionally underserved students ○ 75 girls and 30 migrant students attend STEM summer camps ○ Dissemination and district-provided support for replication of 9th-12th project components in other Oregon schools and districts

Experiential Learning (10 Points): Experiential learning is the process whereby knowledge is created through the transformation of experience, and it is the cornerstone of our project design. The experiential learning that will feature in the project includes the core elements of: (1) Reflection, critical analysis, and synthesis; (2) Opportunities for students to take initiative, make decisions, and be accountable for the results; (3) Opportunities for students to engage intellectually, creatively, emotionally, socially, and physically; and, (4) A designed learning experience that includes learning from natural consequences, mistakes, and successes in real-world, industry-based environments.

The project will enable students to build career knowledge, connect to local industries, and apply learning in authentic ways. In addition to problem- and project-based learning in the classroom, the 21st Century Skills Project includes the following enrichment components: (1) Site visits - Students will visit partner worksites and other STEM industries to learn about the range of employment opportunities available in the community; (2) Business After Hours - Students will gain hands-on experiences in partner facilities after hours with a partner/mentor. They will see the equipment in action and try activities that are permissibly safe; (3) Saturday Academy - Students will attend Saturday Academy at which they will create a product in conjunction with a mentor, while earning partial credit for a 'mini-apprenticeship' and/or CTE Certificate of Completion; (4) Partner-sponsored apprenticeship, internship, and work-study placements; and (5) A student-run enterprise, Grizzly Engineering, Manufacturing, and Fabrication, will enable students to develop and market products that meet an authentic industry need while working with teaching staff and industry-mentors.

3. PROJECT DESCRIPTION (95 Points)

A. Project Outcomes and Progress Markers (15 Points): Project outcomes and progress markers are described in Table B.

Table B: Outcomes and Progress Markers		
Outcome	**Progress Marker**	**Timeline**
Improved and Sustainable Partnerships:	Community-wide strengths and needs audit conducted annually to identify potential new partners and to assess workforce needs, as measured by audit report	August each year of the project
	Continued recruitment and development of project partners through the Chamber, McMinnville Economic Development Partnership, existing STEM partners, STEM-related labor organizations, and SkillsUSA	Ongoing
	21st Century Skills Advisory Council (project leadership and partners) meets quarterly to assess project effectiveness and develop modifications as warranted by data, as measured by minutes and meeting artifacts	Quarterly
	Industry-based apprenticeships, internships, and work-study placements, and student-run enterprise are operational, as measured by district/partner agreements.	Sept.-June each year of the project, beginning Sept. 2014
	Increased district/partner collaboration and leveraging of resources, as measured by partner surveys	May of each year of the project, beginning with baseline survey in May 2014
Improved student access to CTE programs of study	Engineering and Manufacturing Center developed and equipped at McMinnville High School, as measured by observation	June 2014
	Students are engaged in STEM-focused extended learning opportunities that include opportunities to earn Certificates of Completion, as measured by participation rates	Oct.-May each year of the project, beginning Jan. 2014
	Middle school coursework is operational, as measured by course enrollment: ○ Introduction to Engineering - Foundational class for exploring various engineering areas. Hands on problem solving projects using engineering concepts. ○ LEGO Robotics - Hands on exploration of robotics through the design and	Sept.-June each year of the project, beginning Feb. 2014

	programming of LEGO robots to accomplish real world challenges. ○ Applied Robotics - For students who have experience with LEGO Robotics, this class will involve building and programming bigger and more powerful robots using a combination of LEGO electrical components and TETRIX robots. ○ Technical Design - Design objects using CAD type programs and create them using a variety of mediums. ○ Aerospace and Transportation - A look at the history of ground and air transportation and the innovative engineering that made possible everything from the automobile to walking on the moon. ○ Design and Modeling - Introduces students to the design process by teaching them to use a sophisticated mathematical technique for representing solid objects called solid modeling. Students also learn sketching techniques and use descriptive geometry as a component of design, measurement, and computer modeling. ○ Automation and Robotics - This course will allow students to examine the history and development of automation and robotics. They learn about structures, machine automation, energy transfer, and computer control systems. Students will gain knowledge and skills in engineering problem solving and explore requirements for careers in engineering. ○ STEM for Girls - A girls only STEM class that focuses on hands-on problem solving projects using engineering concepts.	
	Growth and expansion targets for the enrollment of traditionally underserved students are met, as measured by student enrollment demographics	Sept.-June each year of the project, beginning Feb. 2014
	Middle school failure rate in STEM coursework is at or below 5%, as measured by student grades	Feb. and June each year of the project
	STEM Summer Camp for Girls is operational, as measured by enrollment and attendance	June each year of the project
	STEM Summer Camp for migrant students is	Aug. each year of the

	operational, as measured by enrollment and attendance	project
	Engineering and Manufacturing Career Pathway dual credit coursework is operational, as measured by course enrollment: ○ Manufacturing Technology1 ▪ MCH 100 Machine Tool Basics (1 credit) ▪ DRF 126 Intro. to AutoCAD (3 credits) ○ Manufacturing Technology 2 ▪ WLD 111 SMAW: Mild Steel and Oxyacetylene (4 credits) ○ Manufacturing Technology 3 ▪ MCH 135 Basic Measuring Tools (1.5 credits) ▪ MCH 150 Precision Measuring Tools (1.5 credits) ▪ MCH 160 Drilling Machines and Operations (2 credits) ○ Manufacturing Technology 4 ▪ WLD 112 SMAW: Mild Steel 1 (4 credits) ○ Advanced Manufacturing ○ Advanced Design ▪ WLD 113 SMAW: Mild Steel 2 (4 credits) ▪ MCH 123 Sheet Metal Fabrication (4 credits)	Sept. 2014 for Manufacturing Technology 1&2, Sept. 2015 for Manufacturing Technology 3&4. and Sept. 2016 for Adv. Manufacturing and Adv. Design
	Failure rate in Engineering and Manufacturing coursework is at or below 10%, as measured by student transcripts	Jan. and June each year of the project, beginning Jan. 2015
	FIRST Tech Challenge and FIRST Robotics Challenge teams are operational, as measured by team participation rates	Sept. - March each year of the project, beginning Jan. 2014
	Dissemination and district-provided support for replication of project components in other Yamhill County and Oregon school districts through MWEC, South Metro/Salem STEM Education Partnership, the regional achievement compact working group, and other district affiliations	Periodically, beginning in Sept. 2015
Outcome	**Progress Marker**	**Timeline**
Increased rigor in technical and academic content aligned to diploma	The 8th and 11th grade proficiency rate on state assessments in math, science, reading, and writing is above state average.	May each year of the project, beginning May 2014
	90% of 6th-8th grade students perform at or above proficiency on problem- and project-based assessments, as measured by a standards-based scoring rubric.	Sept.-June each year of the project, beginning Feb. 2014

requirements, industry-recognized technical standards and employability skills	80% of students enrolled in Engineering and Manufacturing coursework perform at or above proficiency on problem- and project-based assessments, as measured by a standards-based scoring rubric	Sept.-June each year of the project, beginning Sept. 2014
	Increased number of dual high school/college credits earned, as measured by college credit report	Each year of the project, reported in August
	Increased number of traditionally underserved students earning dual credit, as measured by college credit report cross-matched with student demographics	Each year of the project, reported in August
Outcome	**Progress Marker**	**Timeline**
Increase career opportunities for students, which may include access to career and technical student organizations:	SkillsUSA Career is operational, as measured by chapter membership and student participation	Sept. - June each year of the project, beginning Sept. 2014
	Student-run entrepreneurial program, Grizzly Engineering, Manufacturing, and Fabrication, is developing products to address real market needs, as measured by student projects	Sept.-June, beginning Sept. 2015
	Industry-based apprenticeships, internships, and work-study placements are operational, as measured by district/partner agreements	Sept.-June each year of the project, beginning Sept. 2014
Improved ability to meet workforce needs in the region	Increased number of high school students earning CTE Certificates of Completion and Career Pathway diplomas, as measured by certificates and diplomas	Sept.-July each year of the project, beginning Jan. 2014
	Increased student achievement in STEM, as measured by state assessments, performance-based assessments, Certificates of Completion, and postsecondary enrollment	Sept.-June each year of the project, beginning February 2014

B. Career and Technical Education Program of Study Design (15 Points): The 21st Century Skills Project will strengthen and enhance STEM programs at both district middle schools and create a new Engineering and Manufacturing Career Pathway at McMinnville High School. Project coursework will be aligned with Common Core State Standards, Next Generation Science Standards, state academic standards in engineering and manufacturing, industry-recognized technical standards and

employability skills, and Oregon Diploma requirements. The rigorous STEM coursework in 6th-12th grade that will be implemented in the project, when added to the existing Engineering Program of Study at McMinnville High School's Engineering and Aerospace Sciences Academy, will provide a clearly articulated educational pathway with multiple options for students to further pursue STEM education and career aspirations. The dual credit coursework and Certificate of Completion programs that will be offered in the Engineering and Manufacturing Pathway are clearly linked to Oregon University System STEM programs and Certificate of Completion programs, as documented in Appendix A: Career and College Linkage, p. 45-48 of this application. Students will have the opportunity to earn 25 college credits as they complete the coursework sequence. The middle school coursework offered in the project, which is designed to build and sustain the STEM pipeline, will feature Project Lead The Way (PLTW) curriculum and instruction. Project Lead The Way is a nationally recognized exemplar in vibrant and engaging STEM teaching and learning. Project coursework and enrichment experiences are documented in Table C.

Table C: Project Coursework

School/Component	Description
Duniway Middle School and Patton Middle School: STEM Center courses	a) Intro to Engineering b) Lego Robotics c) Applied Robotics d) Technical Design e) Aerospace and Transportation (Project Lead The Way) f) Design and Modeling (Project Lead The Way) g) Automation and Robotics (Project Lead The Way) h) STEM for Girls
McMinnville High School: Engineering and Manufacturing Pathway	a) Manufacturing Technology 1 (dual credit) - Three units of study, utilizing PLTW curriculum (Introduction to Engineering Design), focused on safety, use, and operation of manufacturing equipment, including mills, lathes, presses, grinders, saws, hand tools, and precision measuring instruments, and basic operation and programming of

	robotics b) Manufacturing Technology 2 (dual credit) - Focused on basic welding, machining, and metalworking, skills in stick (SMAW) welding, oxygen and acetylene welding, and sheet metal fabrication, and safety, use, and operation of welding/fabrication equipment c) Manufacturing Technology 3 (dual credit) - Focused on Computer-Aided Design and manufacturing software to design and fabricate projects, basic code for CNC machining and operations, intermediate lathe and mill operations, and manufacturing projects d) Manufacturing Technology 4 (dual credit) - Focused on intermediate welding, machining, and metalworking, skills in wire feed (GMAW) welding, intermediate oxygen and acetylene welding, sheet metal fabrication, and manufacturing projects e) Advanced Manufacturing (dual credit) - Focused on use of simulators (Amatrol) to acquire skills in measurement tools, electricity, fluid systems, pneumatics, mechanical systems, machine tools, thermal technology, and robotics, and advanced project design f) Advanced Design (dual credit) - Focused on advanced welding, machining, and metalworking, including Tig welding and plasma cutter operation, advanced robotics, American Welding Society certifications, product design, and internships and a student-run enterprise including product marketing.
School/Component	**Description**
Duniway Middle School, Patton Middle School, and McMinnville High School: Industry-based and entrepreneurial experiences	a) Site visits - Students will visit partner worksites and other STEM industries to learn about the range of employment opportunities available after graduation and/or postsecondary education b) Business After Hours - Students will gain hands-on experiences in partner facilities after hours with a partner/mentor. They will see the equipment in action and try activities that are permissibly safe c) Saturday Academy - Students will attend Saturday Academy at which they will create a product in conjunction with a mentor, while earning partial credit for a 'mini-apprenticeship' or working towards a Certificate of Completion d) Apprenticeship, internship, and work-study - After students complete the experiences listed above, partners will sponsor apprenticeships, internships, and work-study placements e) Student-run enterprise - Grizzly Engineering, Manufacturing, and Fabrication will enable students to develop and market

	products that meet an authentic industry need while working with teaching staff and industry-mentors
School/Component	**Description**
McMinnville High School: SkillsUSA	Career and Technical Student Organization, SkillsUSA. SkillsUSA is an applied method of instruction for preparing students to become high performance workers in career and technical programs. It provides quality education experiences for students in leadership, teamwork, citizenship, and character development.
Duniway Middle School, Patton Middle School, and McMinnville High School: Recruitment and support for underserved students	STEM Camp for Girls, STEM Camp for migrant students, Freshman Seminar career exploration, scholarships for dual credit fees, extended learning opportunities, and FIRST Tech Challenge.
Duniway Middle School and Patton Middle School: FIRST Tech Challenge McMinnville High School: FIRST Robotics Challenge	FIRST Tech Challenge teams operating at both middle schools and FIRST Robotics Challenge team at McMinnville High School. Girls on the FIRST Robotics Challenge team will participate in the Girls' Generation competition.

The project will prepare students, technically and academically, for postsecondary education and careers that earn a living family wage in our local STEM-driven economy. The STEM industry is strong in McMinnville, the world headquarters of Evergreen and Freelin-Wade, and the manufacturing and distribution headquarters of Cascade Steel. These employers provide high-wage jobs that demand a highly-skilled workforce. A theory of change logic model, documented in Table D, was developed to inform the project design, in order to build a clearly aligned educational pathway leading to college and careers.

Table D: Theory of Change Logic Model			
Input →	**Leverage and Impact Outcomes** →	**Intermediate Outcomes** →	**Long Range Outcomes**
Middle School STEM Centers, featuring Project	Sequenced coursework will prepare students for	Increased student	Increased enrollment and

Lead The Way curriculum and instruction	rigorous coursework in the Engineering and Manufacturing Career Pathway. The preparation will enable students to demonstrate learning through authentic applications utilizing industry-standard tools and technology.	engagement and achievement in STEM	persistence in the Engineering and Manufacturing Career Pathway, the Engineering and Aerospace Sciences Academy, and SOAR Broadcast Engineering Career Pathway
STEM Summer Camp for Girls and STEM Summer Camp for migrant students FIRST Tech Challenge	To increase the number of traditionally underserved students pursuing STEM postsecondary education and careers, we must start, early on, to build interest and aspiration. The STEM Summer Camps, targeting two traditionally underserved subgroups, will engage middle school students in experiential, industry-based learning that will stimulate their interest to pursue STEM.		Increased enrollment of traditionally underserved student subgroups in 9^{th}-12^{th} STEM-intensive Career Pathways
Input ⟶	**Leverage and Impact Outcomes** ⟶	**Intermediate Outcomes** ⟶	**Long Range Outcomes**
Engineering and Manufacturing Career Pathway dual credit coursework: Apprenticeships, internships, work-study placements, and a student-run enterprise SkillsUSA	Students will complete the Engineering and Manufacturing Career Pathway program of study with the opportunity to earn 25 college credits aligned with Oregon University System programs. Over 80% of students who graduate McMinnville High School	Increased student achievement and engagement. Increased college- and career-readiness.	Increased STEM postsecondary enrollment and completion rates. Increased STEM postsecondary enrollment and

Extended learning opportunities, including CTE certification programs FIRST Tech Challenge teams and FIRST Robotics Challenge	with 9+ college credits advance on to postsecondary education with immediate fall enrollment. These two characteristics—early college credit and immediate fall enrollment—significantly increase college retention and completion rates. Industry-based apprenticeships and internships and a student-run enterprise will provide students with real-world experiences and help create connections to local employers. SkillsUSA will connect students to regional and national networks and organizations focused on STEM and CTE postsecondary education and careers. Field- and industry-based teaching and learning will enable to students to learn alongside industry professionals using industry-standard tools and technologies Engaging students and mentors in the process of solving a common problem in a six-week timeframe using a standard "kit of parts" and a common set of rules. Teams build robots from the parts and compete in	Increased connections to local and regional STEM industries	completion rates among traditionally underserved students. Increased CTE certifications. Increased ability to meet local and regional workforce demand for highly-skilled STEM careers. Increased career earnings with opportunities to earn a living family wage without having to earn a college degree.

	performance tasks.		

C. Underserved Students (10 Points): McMinnville School District serves a high-needs student population, as documented in Table E.

Table E: McMinnville School District Demographics					
Total Enrollment	Hispanic	English Learners	Students w/disabilities	Econ. Disadvantaged	First-Generation
6,650	32%	13.3%	13%	62.0%	77.0%

Activities designed to recruit underserved students are described in Table F.

Table F: Support for Underserved Students	
Strategy	**Rationale**
STEM Camp for Girls, providing problem- and project-based learning, field- and industry-based experiences, and mentoring by women STEM professionals	Women have, historically, been underrepresented in STEM postsecondary education and careers. By promoting a healthy and diverse STEM workforce that better reflects the demographics of the population, we will be able to capture benefits such as an increased standard of living, new career opportunities, increased accessibility to programs and products, and economic prosperity. To build the STEM pipeline of girls and women advancing on to STEM postsecondary education and careers, we must build aspirations and interests early on and provide girls with strong role models so they can envision a place for themselves in the STEM field.
STEM Camp for migrant students, featuring the following research-based strategies: (a) Multicultural and culturally competent curriculum, instruction, and assessment; (b) Challenging mathematical tasks; (c) Multimodal representations, including nonlinguistic images, graphic representations, physical models, mental pictures, self-drawn pictures, and kinesthetic activities; (d) Academic language applications; and, (e) Technology-rich teaching and learning that provides multiple means of representing content and concepts, multiple means	Nationally, English Learners have less access to STEM than native speakers. However, a multi-lingual STEM workforce is essential to keeping the country competitive in an increasingly competitive global economy. Programs that focus on building students' excitement and aspirations around STEM through hands-on learning, building self-confidence, and providing strong role models, have been found to be the most effective entry-point into STEM for English Learners.

of action, expression, and demonstration of learning, and multiple points of entry into the curriculum	
Strategy	**Rationale**
SkillsUSA	SkillsUSA serves students, educators, and business and industry by keeping up with both employers' needs and education mandates and trends. Business, industry, and education partnerships thrive in curricula programs that require industry input in classroom standards.
Project Lead The Way middle school engineering coursework	Middle school engineering coursework will be a required elective rotation for all students, in order to expose students to highly-engaging STEM teaching and learning, building interests and aspirations early on.
FIRST Tech Challenge teams in middle school afterschool programs and FIRST Robotics Challenge in the high school afterschool program	FTC will build a bridge between the district's existing FIRST Lego Robotics teams at the elementary schools and McMinnville High School's FIRST Robotics Challenge team. Targeted recruitment of underserved students will occur in the afterschool program, which serves a high percentage of economically disadvantaged students, Hispanic students, and English Learners.
Freshman Seminar, a required year-long course for all 9th graders	Students will gain hands-on experiences in each of the Career Pathways offered at McMinnville High School, including the new Engineering and Manufacturing Pathway, so they can make informed choices when forecasting into 10th grade. The more informed the choice, the greater the student retention.
Dual Credit coursework	Scholarships will be provided for all economically disadvantaged students to cover college registration and transcript fees for the dual credit coursework that will be offered in the new pathway
Research-based instructional strategies	All project instruction will utilize Power Strategies for Effective Teaching, the district's instructional framework, focused on activating learning, engaging the learner, and strengthening literacy. Power Strategies are research-based instructional strategies that have been documented to enhance achievement and accelerate growth for all students in all subject areas at all grade levels.

D. Diploma Connections (10 Points): The 21st Century Skills Project will help ensure students meet the requirements of the Oregon Diploma. The new Engineering and

Manufacturing Pathway will offer six sequenced courses that will enable students to satisfy Diploma requirements for CTE and career pathway credits, while also earning the Career Pathway Diploma Endorsement offered at McMinnville High School. Additionally, students will have the opportunity to earn 25 college credits that will transfer to the Oregon University System. Pathway coursework will be aligned with Common Core State Standards in reading/Language Arts and math, as well as engineering standards, to better support students to meet the Essential Skills diploma requirement. The student-centered project- and problem-based learning that will characterize the coursework will personalize the learning experience, while increasing rigor and relevance.

E. Sustainability and Communication (25 Points): Project sustainability and return on investment were key considerations in designing the 21st Century Skills Project. A CTE Revitalization grant would provide startup and development funds to strengthen the middle school engineering program and to add a new Engineering and Manufacturing Career Pathway at McMinnville High School. Grant funds will support: (1) Teacher training to build capacity to teach industry-standard skill-sets, including Amatrol training and industry-based internships for teachers, to ensure teachers master the skill-sets they will be fostering in students. The training is a one-time cost; (2) Initial licensed FTE to develop curriculum for a fully articulated Engineering and Manufacturing Pathway aligned with Common Core and engineering standards, featuring coursework that provides students with dual high school/college credit opportunities, Certificate of Completion opportunities, and industry-based applications of learning. The program development is a one-time cost; (3) FTE for the STEM summer camps for girls and

migrant youth. This is a recurring cost that will transfer to the general fund after the period of grant funding. Additionally, a fee-based approach for the STEM Camp for Girls will be phased in to support sustainability, though there will be no fee to attend the camp for economically disadvantaged girls; (4) Stipend for SkillsUSA advisor in year-two. This is a recurring cost that will transfer to the general fund after the period of grant funding; (5) Industry-standard tools and technology to equip STEM Centers at both middle schools and an Engineering and Manufacturing Center at the high school. This is a one-time cost, with ongoing maintenance paid for out the district technology set-aside fund; and, (6) Independent evaluation of the project. Evaluation is a one-time cost incurred during the period of grant funding.

By focusing CTE Revitalization funding on startup and development costs, while maximally leveraging other grant funds and partnership resources, we have designed a project that can be sustained. Beyond initial startup costs, there is no significant additional cost to the District, in terms of licensed teaching staff, because the students who enroll in STEM coursework would have been enrolled in other programs if STEM wasn't offered, so the salaries supporting FTE for the new pathway and middle school coursework represent a shift in resources rather than new costs. The costs associated with partnership activities (dual credit support, mentors, facilities for place-based learning, project promotion, etc.) are being provided by committed partners, and new partners will be identified and recruited as the project grows over subsequent years.

Project outcomes, strategies, and deliverables will be disseminated through a variety of communication modes, as documented in Table G.

Table G: Project Communications Plan	
Mode	**Description**

School newsletters and websites	Communications about the project will reach parents and students through monthly school newsletters that are mailed home (English/Spanish) and posted on school websites. Parents and students will also be informed about the project at a variety of events that bring parents and families into the schools, such as college nights, STEM night, parent/teacher conferences, registration, etc. Engineering and Manufacturing Pathway coursework will be clearly articulated, including links to aligned college programs and careers, including the average salary of those careers, in the high school course catalog. A hardcopy of the course catalog is provided to every student and is also available for download on the school website.
Mode	**Description**
21st Century Skills Project Advisory Council	The Advisory Council, comprised of project leadership, partners, and other stakeholders, will meet quarterly, or more frequently as needed, to facilitate constructive communications, assess project performance, and make modification as warranted.
Staff meetings and Professional Learning Communities/Data Team meetings	Project communications will occur in school staff meetings (once a month) and in twice-monthly Professional Learning Communities/Data Team meetings.
Evaluation Report	Annual Performance Reports will be developed and disseminated on a project website that will be linked to the district website.
Project website	Project outcomes, strategies, artifacts, and deliverables will be disseminated on the project website that will be linked to the district site. The website will feature videos of STEM learning in action, lesson plans, student work samples, and other project artifacts.
McMinnville Chamber of Commerce and McMinnville Economic Development Partnership	The Chamber and McMinnville Economic Development Partnership have committed to provide communications and publicity about the project to area businesses and industries, in order to help identify and recruit new partners and provide more industry-based opportunities for students.
South Metro/Salem STEM Partnership and other STEM networks	Dissemination of project outcomes, strategies, products, and other deliverables will occur in a variety of STEM networks in which the district participates and at regional and state STEM conferences.
McMinnville media	The project will be promoted in articles in the *McMinnville News Register* and on McMinnville Community Media (TV and radio).

F. Activities and Timeline (10 Points)

Table H: Activities and Timeline			
Activity	**Outcome**	**Rationale**	**Timeline**

STEM Centers and Engineering and Manufacturing Center	STEM Centers and the Engineering and Manufacturing Center are equipped.	To be effective and increase student achievement, STEM learning must be focused on authentic applications of learning, and such learning requires industry-standard technology and equipment.	Jan.-March 2014
Activity	**Outcome**	**Rationale**	**Timeline**
Manufacturing Technology 1, 2, 3, and 4, dual high school/college credit courses developed	Standards-based curriculum, with problem- and project-based learning at the core, is developed and curriculum is mapped.	Standards-based, hands-on teaching and learning will increase student achievement.	Jan.-July 2014
Students enroll in and complete middle school STEM coursework	Increase student enrollment, achievement, and engagement in engineering, particularly among traditionally underserved student subgroups.	Vibrant STEM teaching and learning in 6^{th}-8^{th} grade will help build the STEM pipeline and will recruit underserved students to STEM.	Feb.-June 2014 then Sept.-June thereafter
Independent project evaluation	Support continuous project improvement through the evaluation of project outcomes aligned with key performance indicators.	Project effectiveness will be enhanced by building on identified strengths and addressing any gaps or weaknesses.	May of each year of the project
STEM summer camp for girls	Increase student enrollment, achievement, and engagement in engineering, particularly among traditionally underserved student subgroups.	Girls are significantly underrepresented in STEM. To reverse this, the camp will support girls to increase their sense of confidence and competence in STEM.	June 2014 and each June thereafter
STEM summer camp for migrant students	Increase student enrollment, achievement, and engagement in engineering,	English Learners (ELs) are significantly underrepresented in STEM. To reverse this, the camp will support ELs to	Aug. 2014 and each Aug. thereafter

	particularly among traditionally underserved student subgroups.	increase their sense of confidence and competence in STEM.	
Activity	**Outcome**	**Rationale**	**Timeline**
Industry-based apprenticeships, internships, and work-study placements developed and implemented with partners	Increase student achievement and engagement in STEM and connect students to STEM industries and STEM career opportunities in our community.	To be effective and increase student achievement, STEM learning must be focused on authentic applications of learning, and such learning requires industry-standard technology and equipment and exposure to real-world careers.	Jan.-June 2014 development Sept. 2014 - June 2015 and every year thereafter implementation
Professional development and industry-based training and certifications for teachers, including Amatrol certification	Increase teacher capacity and effectiveness to provide rigorous STEM curriculum and instruction aligned with the Oregon Skill Sets in engineering and manufacturing and with industry recognized standards.	Highly-effective curriculum and instruction, utilizing industry-standard technology and equipment, will enable teachers to best support student learning and authentic applications.	Jan.-August 2014
Manufacturing Technology 1 and 2 coursework is operational	Standards-based curriculum, with problem- and project-based learning at the core.	Standards-based, hands-on teaching and learning will increase student achievement. Earning dual credit will increase postsecondary enrollment.	Sept. 2014
SkillsUSA	SkillsUSA chapter is opened and students are participating.	SkillsUSA is an applied method of instruction for preparing students to become high performance workers in career and technical programs. It provides quality education experiences for students in leadership, teamwork, citizenship, and character development.	Sept. 2014
Site visits to industry	Increase student engagement and	Connections to STEM career opportunities within	Sept. 2014 - June 2015 and

partners	achievement in STEM, particularly among traditionally underserved student subgroups.	our community that are high-wage and high-demand will further incentivize students to pursue engineering and manufacturing.	each year thereafter
Activity	**Outcome**	**Rationale**	**Timeline**
Manufacturing Technology 3 and 4 coursework is operational	Standards-based curriculum, with problem- and project-based learning at the core.	Standards-based, hands-on teaching and learning will increase student achievement. Earning dual credit will increase postsecondary enrollment.	Sept. 2015
Student-run enterprise in engineering, manufacturing, and fabrication	A student-run enterprise, Grizzly Engineering, Manufacturing, and Fabrication is developed, with implementation occurring after the period of grant funding.	To be effective and increase student achievement, STEM learning must be focused on authentic applications of learning, and such learning requires industry-standard technology and equipment and exposure to real-world markets.	Sept. 2016
Advanced Manufacturing and Advanced Design coursework is operational	Standards-based curriculum, with problem- and project-based learning at the core	Standards-based, hands-on teaching and learning will increase student achievement. Earning dual credit will increase postsecondary enrollment.	Sept. 2016
Project Advisory Council meetings	Increase collaboration between the District and project partners	The greater the level of collaboration among the District and industry-based partners, the more plentiful the opportunities for students to apply learning, and the stronger their connection to local careers and postsecondary learning	Quarterly, from date of grant award and ongoing beyond the period of funding
Project evaluation	Project evaluation conducted and APR disseminated.	Comprehensive evaluation is critical to continuous improvement	Annually, in May, with APR submitted on ODE timeline

G. Evaluation (10 Points): An objective and independent evaluation of the project will serve five primary purposes: (1) To assess the effectiveness and cost-benefit of project

components to determine whether they produce meaningful effects on student achievement and whether and to what extent the project is achieving or has achieved its intended outcomes; (2) To evaluate the implementation of individual components within the project for purposes of ongoing feedback and continuous improvement; (3) To support all reporting and accountability requirements set forth in the CTE Revitalization Program; (4) To provide guidance about effective products and practices for dissemination, replication, and/or testing in other settings; and, (5) To assess partner and student satisfaction with the project and its implementation. The evaluators and project leadership will collect, analyze, and report on data aligned with project outcomes. The evaluation will document project implementation, understand how project goals and objectives are put into action, and monitor project activities. The evaluation will serve as the historical record of project implementation so that it will be possible to document and learn from the successes and identify and address any gaps and weaknesses. Additionally, the evaluation of project implementation is important to ensure fidelity and to establish the context in which to interpret the results of the summative evaluation. The evaluation team will: (1) Conduct extensive site observations of project components, services, and activities, providing constructive feedback that goes beyond mere description; (2) Analyze student performance data and project performance data aligned with each objective; (3) Conduct stakeholder (students, partners, teachers, etc.) surveys and interviews; and, (4) Formulate an Annual Performance Report with specific recommendations, based on analysis of performance data and site observations, to support continuous program improvement.

Observations of project services and strategies will emphasize: (1) Curriculum and instruction – focusing on curriculum, instructional strategies, including problem- and project-based learning, and targeted interventions will assess the extent to which teachers and partners/mentors make the most of opportunities to effectively support core academic and CTE learning, career exploration, and college- and career-readiness; (2) Social/emotional support activities – focusing on social and emotional functioning in industry-based mentoring, manufacturing courses, and related project activities will evaluate the dimensions of creating and sustaining a college and career-going culture and climate; and 3) Career guidance and industry outreach – focusing on CTE guidance and collaborative partnership activities will evaluate the extent to which students in the project are provided personalized assistance to complete the critical steps to college and career-entry, including connecting students to local STEM career opportunities, the extent to which those efforts bring results, and the extent to which District and industry collaboration supports project objectives.

Project services and activities will be evaluated using an observation instrument that assesses teacher and/or mentor behaviors and student behaviors. The instrument formulates, on each lesson/activity observed, a quantitative composite measure of multiple aspects of lesson/activity design and implementation, skills taught/fostered, and culture created and maintained, allowing for a more rigorous statistical comparison. The instrument also incorporates a qualitative assessment of teaching and learning activities. Reliability will be addressed through the collection of low-inference measures of teacher/mentor behavior as a predictor of student achievement and high-inference measures as a predictor of student attitude, evaluating both process and product.

Objectivity will concurrently be assured by using low-inference measures with well-specified performance levels associated with the observation rubric.

Partnerships (25 Points): The list of partners, partner assurances, and letters of commitment are provided in the Required Documentation section of this application. Over the last ten years, the district has been successful in identifying and recruiting local and regional partners connected to STEM and other CTE programs. As evidence of that success, our partnership with Evergreen Aviation and Space Museum resulted in the opening, five years ago, of the Engineering and Aerospace Sciences Academy (EASA), a 9th-12th STEM-intensive career pathway that is located in the Evergreen Space Museum. The partnership benefits the district because Evergreen provides state-of-the-art classroom space for the academy and Evergreen docents provide curriculum and instructional support. The partnership benefits Evergreen because events and activities hosted at EASA draw people to the Museum and the expertise of our educators augments programs at the Museum. More importantly, the EASA program prepares students for STEM careers that can address Evergreen's workforce needs.

For the last three years, Tony Vicknair, Director of Secondary Programs, has met with project partners, including Evergreen who will also partner on this project, and other STEM-related industries on a periodic basis to discuss an imperative workforce need in the STEM field of manufacturing. With the reissue of the CTE Revitalization Program, Mr. Vicknair and project partners began meeting on a regular basis to fully articulate the project design. These STEM partners also played a critical role in the development of the district's new 21st CCLC Project, and they will fulfill an essential role

in delivering field- and industry-based extended-day and year STEM and CTE curriculum and instruction that will augment this project.

All project partners are committed to the implementation of the 21st Century Skills Project and to sustaining the project beyond the period of grant funding. This project represents a strengthening of existing partnerships, taking them to the much deeper level of collective impact partnerships, characterized by: (1) A structured process that leads to a common agenda; (2) Shared objectives; (3) Continuous communication; and, (4) Mutually reinforcing activities among all partners and participants. The responsibilities of project partners are detailed in Table I.

Table I: Partner Roles and Responsibilities

Partner	Role
Portland Community College	College credit coursework approval staff accreditation, and student transcripts
Evergreen, Cascade Steel, Freelin-Wade	Worksite and STEM industry visits for middle school students interested in engineering and manufacturing
Evergreen, Cascade Steel, Freelin-Wade	Business After Hours opportunities for students to apply learning at partner worksites with partner mentors
Evergreen, Cascade Steel, Freelin-Wade	Saturday Academy opportunities for students to apply complex and extended learning to develop a product at the partner worksite and in collaboration with the partner mentor
Evergreen, Cascade Steel, Freelin-Wade	Apprenticeship, internship, and work study opportunities for students
McMinnville Area Chamber of Commerce and McMinnville Economic Development Partnership	Project promotion and assistance in identifying and recruiting new partners and opportunities for students to engage in industry-based learning.

The District and its partners are committed to ensuring implementation and sustainability of all project components featured in this application, and that commitment is grounded in the realization that there is an imperative workforce need in our community for highly-skilled STEM workers, within all areas of the industry and requiring

a variety of educational attainment levels, from high school diploma to doctorate degrees.

5. Bonus Narrative

A. Career and Technical Student Organizations (7 Points)

SkillsUSA will be embedded in the Engineering and Manufacturing Career Pathway program at McMinnville High School. Participating students will be enrolled in the pathway and the SkillsUSA advisor will be the engineering and manufacturing teacher. SkillsUSA will impact the overall school environment by enabling students to connect to local STEM industries and to develop a student-run entrepreneurial enterprise that will address real-world problems and real-market needs. The authentic learning that will be augmented with SkillsUSA activities will provide robust experiences for McMinnville High School students. SkillsUSA will be linked to partners in the community through the Project Advisory Council and the partnership activities that will be implemented in the extended-day and year components. Additionally, partners will participate in SkillsUSA Week activities and in SkillsUSA National Week of Service. Students will be recruited to SkillsUSA beginning in middle school, through STEM Center coursework and through STEM Camp for Girls and STEM Camp for Migrant Students. SkillsUSA activities will be conducted before and after school.

B. Middle School Component (7 Points)

The middle school component of the project will provide the foundation for entry into the Engineering and Manufacturing Career Pathway at McMinnville High School. Students will engage in STEM coursework as part of the required elective rotation. The following coursework will be offered:

- Introduction to Engineering
- LEGO Robotics
- Applied Robotics

- Technical Design
- Aerospace and Transportation
- Design and Modeling
- Automation and Robotics
- STEM for Girls
- STEM Summer Camp for migrant students (6^{th}-8^{th} grade)
- STEM Camp for Girls (6^{th}-8^{th} grade).

Additionally, FIRST Tech Challenge teams at both middle schools will serve as the pipeline to the FIRST Robotics Challenge team at the high school. Students will be informed explicitly about STEM opportunities at the high school and beyond in the STEM elective course rotations and also in the weekly ASPIRE advisory period which is focused on college and career. Middle School students will also participate in college campus visits and STEM worksite visits that will connect school-based learning to STEM postsecondary programs and careers.

C. Out of School Time Programming (7 Points)

Middle school and high school students will participate in out of school time project components, with expertise, mentoring, and facilities provided by partners, including:

- FIRST Tech Challenge teams at each middle school
- FIRST Robotics Challenge team at McMinnville High School
- Saturday Academy, industry-based teaching and learning and Certification Completion programs
- Business After Hours, industry-based teaching and learning

- Summer Certification Completion programs
- Worksite visits, internships, and apprenticeships
- SkillsUSA, a Career and Technical student organization

Out of school time activities will be linked to school day curriculum and instruction, utilizing both school-day teachers and partnership mentors, enabling students to gain the knowledge and build the skill-sets they will need to apply the learning in real-world settings. Robotics coaches and the SkillsUSA advisor will be teachers of STEM courses featured in the project. Additionally, course teachers will collaborate with partners to provide industry-based instruction outside of the traditional school day.