

**Montana Mathematics and Science Partnership (MSP)
Program Application:
Montana Partnership with Regions for Excellence in
STEM (MPRES)
Joint application from Dr. Ken Miller
and
Rayelynn Connole**

Grant Application

August 31, 2012

Section 1: Cover Sheet

MONTANA MATHEMATICS AND SCIENCE PARTNERSHIP (MSP) PROGRAM APPLICATION

Applying Institution or Organization: MONTANA TECH OF THE UNIVERSITY OF MONTANA (fiscal agent)

Program Title: Montana Partnership with Regions for Excellence in STEM (MPRES)

Program Director(s)

Name: Rayelynn Connole
Title: Cfwep.Org Curriculum Coordinator
Address: Institute for Educational Opportunities, Montana Tech
1300 W Park St
Zip Code: 59701
Telephone: Fax: (406)496-4898 fax (406)496-4696
E-Mail: rconnole@mtech.edu

Program Director(s)

Name: Dr. Ken Miller
Title: Director of Educational Programs, College of Education
Address: Room 262
Montana State University Billings
Billings, MT
Zip Code: 59101
Telephone: Fax: (406)657- 2034
E-Mail: kmiller@msubillings.edu

Amount of MSP Funds Requested: \$ 1,005,534

Number of Teachers to Be Served Directly:

Certification by Authorized or Institutional Official:

The applicant certifies that to the best of his/her knowledge the information in this application is correct, that the filing of this application is duly authorized by the governing body of this organization, or institution, and that the applicant will comply with the attached statement of assurances.

**Authorized Official Grants
Officer or Superintendent of Fiscal Agent**

Title

Signature of Authorized Official

Date

Section 2: Abstract

The **Montana Partnership with Regions for Excellence in STEM (MPRES)** is designed to build upon two previous, successfully implemented Montana Science Partnership (MSP) projects. By working with a knowledgeable group of partners, project leaders are committed to improving K-12 science student achievement, and teacher science content and pedagogical knowledge. This project will implement high-quality professional development by integrating inquiry-based science with the K-12 Framework for Science Education (Framework) and the forthcoming Next Generation Science Standards (NGSS). MPRES offers a statewide, research-based, sustainable professional development program that supports the Montana STEM initiative and collaborates with each Regional Education Service Area (RESA). The project aims to develop a cadre of Teacher Trainers who will work within each RESA to scale-up the impact of the MSP program.

MPRES will utilize the blended learning model, which has proven effective in both prior projects, to deliver face-to-face and online, inquiry-based science professional development. STEM and education faculty will mentor teachers through online science modules and exemplar lessons developed during the previous projects, along with creating a new interactive, online science course specific to the Framework and NGSS. Twelve teachers who have previously participated with the MSP projects will be recruited as trainers. They will complete a year-long program of professional development in **Year 1**. During **Year 2**, the 12 trainers will each recruit five teachers to receive professional development with four of these teachers becoming trainers for their region. This second year is an empowering year with regards to the sustainability of the project because the trainers will use the science modules to train the new trainers and teachers, as well as hosting monthly professional learning community meetings. During **Year 3**, all 16 trainers will recruit another cohort of teachers for an absolute total of 152 teachers being provided with professional development.

Section 3: Partnership Operational Narrative

Introduction:

The Montana Partnership with Regions for Excellence in STEM (MPRES) Project will improve the academic achievement of science students in Montana by scaling up two successfully implemented state MSP projects. The PRISM and SMSPP project teams have come together to offer a state-wide, sustainable professional development program focused on the K-12 Framework for Science Education (herein referred to as the “Framework”) and the forthcoming Next Generation Science Standards (NGSS). The project directors have demonstrated success with designing blended-learning models that offer inquiry-based pedagogy skills and science content knowledge conducted by Science, Technology, Engineering and Mathematics (STEM) and Education faculty. The collective expertise of the partners will be further disseminated throughout Montana, creating a cadre of highly trained professional science instructional leaders. In order to achieve this end, the partners have combined the resources of both projects to create a comprehensive, three-year teacher training system.

Upon completion of the three year project, teacher trainers will provide professional development training to teachers in their regions. These teacher trainers will have access to the online tools developed through the projects and the facilitation skills necessary to provide comprehensive professional development throughout the state. The MPRES project components are:

- **Rich, interactive web-based learning modules:** These are designed to facilitate teacher content knowledge in the sciences and further develop teachers understanding of the Framework.
- **Interactive online learning community:** Utilizing the core tenets of professional learning communities, including time allocated for research, peer review and collaboration, the online learning community will be moderated by STEM faculty, Education faculty, and professional field scientists/content experts to ensure that teachers are receiving high-quality science instruction and excellent pedagogy skills. The online learning community will allow for job-embedded professional development and ensure that teachers are able to be

reflective of their practice as they attempt new techniques. The teacher trainers will also engage online to discuss effective professional development techniques. Dr. John Graves of MSU Bozeman will facilitate a graduate course for the trainers and a subsequent course for each teacher recruited by the trainers.

- **Four face-to-face workshops annually:** Throughout the grant cycle, workshops consisting of field trips and content instruction facilitated by STEM and Education faculty will be provided. These workshops will also include collaborative work time for lesson creation and the transfer of skills to the classroom, in addition to leadership training. **Year 1** workshops will be hosted by the project team leaders, and in subsequent years, will be hosted by the teacher trainers with support from the project team leaders. Each workshop will focus on one of the dimensions of the Framework and will build a strong understanding of each in the context of these activities.
- **Two annual leadership workshops:** Area principals, superintendents, curriculum directors, and RESA partners will focus on effective implementation practices at the school level and allow developing trainers to establish partnerships with the area schools. The leadership workshops will ensure that trainers are effectively networking with area principals and instructional leaders as well as with STEM and Education faculty members from the Universities.
- **Year-round online technical support and mentoring by MPRES partners:** An existing network of professional and technical advisors will provide support to the new teacher trainers through the use of the online network and during workshops.
- **Project support for PLC group development in areas:** The project partners will support new trainers' development of PLC groups in their regions that focus on understanding the Framework, adoption of the NGSS when applicable, development of science framework practice skills, and general support for the course instruction. The PLC groups are designed to ensure job-embedded training for teachers regarding the Framework.

MPRES will meet the Goals of the Montana MSP Program by:

Goal 1 (Scale-up): The project partners have demonstrated success with implementation of two high-quality MSP projects. Both former MSP projects have completed rigorous evaluations and have foundational research to support the proposed model. The strengths of each project fused together ensure high quality professional development for teachers in the areas of content knowledge and pedagogy skills. The proposed approach to scale-up is a synergistic approach of top-down and bottom-up practices, ensuring that there is buy-in and support throughout the education systems.

Goal 2 (On-demand learning modules): The SMSP project has developed eight online modules for content knowledge development. The PRISM project has developed exemplar lesson modules focused at specific grade-levels. These two components will be hosted online at www.sciencepartners.info for use by trainers and teachers and can be currently reviewed at redmtncommunications.com. The project partners will further develop three additional modules in **Year 1**: 1) Inquiry Science Pedagogy and the Development of Science Framework Practice Skills; 2) The Framework and Next Generation Science Standards: How to Implement in the Classroom; and 3) Engineering Design and Cross-cutting Concepts in Science.

Goal 3 (Engage the five RESA's): The project partners have directly engaged RESA 4U and MRESA III to be active partners with responsibility for recruiting teachers and trainers and co-creation of the project model. The RESA partners will identify professional development (PD) activities within their districts and give suggestions to the project leaders about building upon the districts' PD activities. During this first year, RESA 4U and MRESA III will assist the project team leaders with evaluating the efficacy of the training model and help to recalibrate any needed changes to the professional development model. After the first year, the other three RESA's will step up in partnership and will also collaborate with the project leaders. Two RESA meetings per year are scheduled in order to ensure active participation within the project.

Goal 4 (Support the STEM initiative): Dr. Ken Miller, Jeanie Kalotay, Rayelynn Connole, Dr. John Graves, and Dr. Arlene Alvarado are all current seated members of the MT STEM initiative team and have provided on-

going support and leadership for the initiative. All four partners will continue their support of the STEM initiative and will recruit a teacher from each region to also lend expertise and support for the initiative. In **Years 2 and 3**, the project partners will present findings at the annual STEM initiative meeting.

Goal 5 (Participate in rigorous evaluation): Dr. Phyllis Ault of Education Northwest and Dr. Michael Coe of Cedar Lake Research have agreed to assist the project team with the evaluation project and will serve as the chairs of the evaluation advisory board team. The evaluation advisory board will collaborate with the Office of Public Instruction officials and the Education Northwest evaluator for the state-level evaluation. The project aims to assess the fidelity of the model's implementation at all levels, and identify regional barriers or concerns for implementation.

Section 3a: Partnerships

The Montana Partnership with Regions for Excellence in STEM (MPRES) project has long-standing relationships due to their collective work in previous MSP projects as well as other professional development initiatives. The project partners are all demonstrated leaders in STEM education and teacher professional development who can effectively lead the MPRES project.

Core Partners:

- 1) Cfwep.Org, (Clark Fork Watershed Education Program), Montana Tech, U of Montana
- 2) Montana State University-Billings College of Education, Science Education
- 3) Montana State University-Bozeman Department of Education, Science Education and Burns Technology Center (BTC)
- 4) Montana Tech, University of Montana, College of Letters, Sciences, and Prof. Studies
- 5) Montana Educational Consortium (MEC)
- 6) Alliance for Curriculum Enhancement (ACE)
- 7) Education Northwest (EDNW)
- 8) Cedar Lake Research
- 9) Billings Public Schools
- 10) Butte Public Schools
- 11) Prairie Educational Service Area (PESA)
- 12) Montana North Central Educational Service Region (MNCESR)
- 13) Montana Regional Education Service Area III (MRESA3)
- 14) Montana Region IV Educational Service Agency (RESA4U)
- 15) Western Montana Comprehensive System for Prof. Development (WM-CSPD)

(1) Cfwep.Org: Formerly known as the Clark Fork Watershed Education Program, Cfwep.Org was created in 2004 to enhance science learning in local schools by using the Clark Fork River Contiguous Superfund site as an outdoor laboratory with professional scientists teaching about the effects of settlement and industry on the Upper Clark Fork Basin. The program has reached over 20,000 students and provided professional development for over 400 teachers to date. Cfwep.Org operates through active partnerships with 11 school districts, the Natural Resource Damages Program (NRDP) of the Montana Department of Justice, the United States Environmental Protection Agency (EPA), research units at Montana State University and the University of Montana, non-profit agencies such as Trout Unlimited and the Rocky Mountain Elk Foundation, and local government agencies.

(2-3) Montana State University-Billings, College of Education; Montana State University-Bozeman, Department of Education; and Burns Telecommunications Center: The College of Education at MSU-Billings and the Department of Education at MSU-Bozeman are committed to working with the project partners to improve science teaching and learning in Montana Public Schools. Both education departments are committed to preparing teachers who demonstrate the highest ideals of the teaching profession. The expertise of science education faculty, Dr. Kenneth Miller, Dr. John Graves, and Dr. Arthur Bangert will be utilized for this MSP project. Education faculty will also provide leadership and oversight in the design, implementation and assessment of the online learning community component of this project.

Also engaged in this project from MSU-Bozeman will be the Burns Telecommunications Center (BTC). The BTC and the Department of Education have a long history of successful online science education program development and delivery. The BTC is the originator and home of the National Teachers Enhancement Network originally funded by the National Science Foundation, which has reached over 8,000 teachers nationally and internationally with graduate science and education courses designed to increase teachers' science content knowledge. Montana State University-Billings is recognized by the Board of Regents as the leader in Montana for online course delivery and pedagogical techniques.

(4) Montana Tech, University of Montana, College of Letters, Sciences, and Professional Studies:

Cfwep.Org has strong partnerships with STEM faculty members at Montana Tech and will ensure that STEM faculty members provide oversight and development of the science modules. Dr. Doug Coe has extensive experience working with the previous Montana Tech MSP projects and has committed his staff and resources to development of effective science content for teachers.

(5-6) Montana Educational Consortium (MEC); and Alliance for Curriculum Enhancement (ACE): The

MEC and ACE are high-need local education agency partners who were formed in response to the many changes, reforms, and mandates affecting national and state education standards today. Specifically, the consortiums were formed to address curriculum, assessments and professional development needs of its member schools. The inclusion of MEC and ACE as partners, who together have over 50 member schools, will clarify the project's vision to work collaboratively and in partnership to overcome the challenges of isolation in Montana.

(7-8) Education Northwest (EDNW); and Cedar Lake Research: EDNW and Cedar Lake Research are

qualified project evaluator partners who have provided educators with services in educational research, evaluation, assessment and technical assistance for 40 years in the Pacific Northwest and nationally. These partners will serve on the Core Planning Team to ensure that the project and evaluation design are fully integrated, and that the implementation of the project will maintain the integrity of the research design. Drs. Michael Coe and Phyllis Ault have extensive experience in designing and conducting experimental, quasi-experimental, and mixed-methods evaluation research and in applying these methods to studies of science education.

(9-10) Billings Public Schools; and Butte Public Schools: The mission of Billings Public Schools is to

educate individuals of all ages to become caring, competent, and contributing members of the community and world. The core purpose of Butte Public Schools is to provide students with the essential skills and knowledge to be successful in life. Billings Public Schools and Butte Public Schools currently enroll approximately 20,288

students combined and are both high-need local educational agencies. If funded, these partner school districts will recommend teachers to engage in the training. The partner districts will have responsibility for providing feedback and direction regarding the content of the training program.

(11-15) PESA; MNCESR; MRESA3; RESA4U; and WM-CSPD: Montana's five Regional Educational Service Areas (RESAs) are valuable and active partners. The RESAs are funded by the Office of Public Instruction through a Montana Professional Development Partnership project grant. The Montana Professional Development Partnership Project's purpose is to improve student achievement in Montana schools by providing state support and funding for high-quality professional development that builds instructional capacities and the growth of student achievement. The RESAs encourage and support the development of a regional plan for sustainable and collaborative relations among all partners that will address the challenges and limitations that are presented by the geographic size and rural nature of Montana. The RESAs will help recruit teachers and trainers for their respective regions, and be active members on the Core Planning Team to assist with evaluating the efficacy of the training model.

Project Leadership Team

Dr. Kenneth Miller, PI, MSU-Billings
Rayelynn Connole, PI, Montana Tech
Dr. John Graves, Education Faculty, MSU-Bozeman
Dr. Arlene Alvarado, STEM Faculty, Montana Tech
Jeanie Kalotay, Grant Project Coordinator, MSU-Billings
Dr. Phyllis Ault, Evaluator, Education Northwest

All members of the Project Leadership Team are members of **the Core Planning Team**, which includes the following members:

Local Educational Agencies:

Fred Seidensticker, Director, Montana Educational Consortium
Andrea Fischer, Director, Alliance for Curriculum Enhancement
Judy Boyle, Teacher, Butte Public Schools
Judy Jonart, Superintendent, Butte Public Schools
Kim Anthony, Curriculum Director, Billings Public Schools
Tobin Novasio, Superintendent, Lockwood Schools

STEM Faculty:

Dr. Marisa Pedulla, Biology Professor, Montana Tech
Dr. Colleen Elliott, Geology Professor, Montana Tech Bureau of Mines and Geology
Dr. Mark Jacobsen, Math Professor, MSU-Billings

Regional Education Service Areas Directors:

- Kim Stanton, Prairie Educational Service Area (PESA),
- Gaye Genereux, Montana North Central Educational Service Region (MNCESR)
- Marsha Sampson, Montana Regional Education Service Area III (MRESA3)
- Bruce Grubbs, Montana Region IV Educational Service Agency (RESA4U)
- Nancy Marks, Western Montana Comprehensive System for Prof. Development (WM-CSPD)

Science Education Faculty:

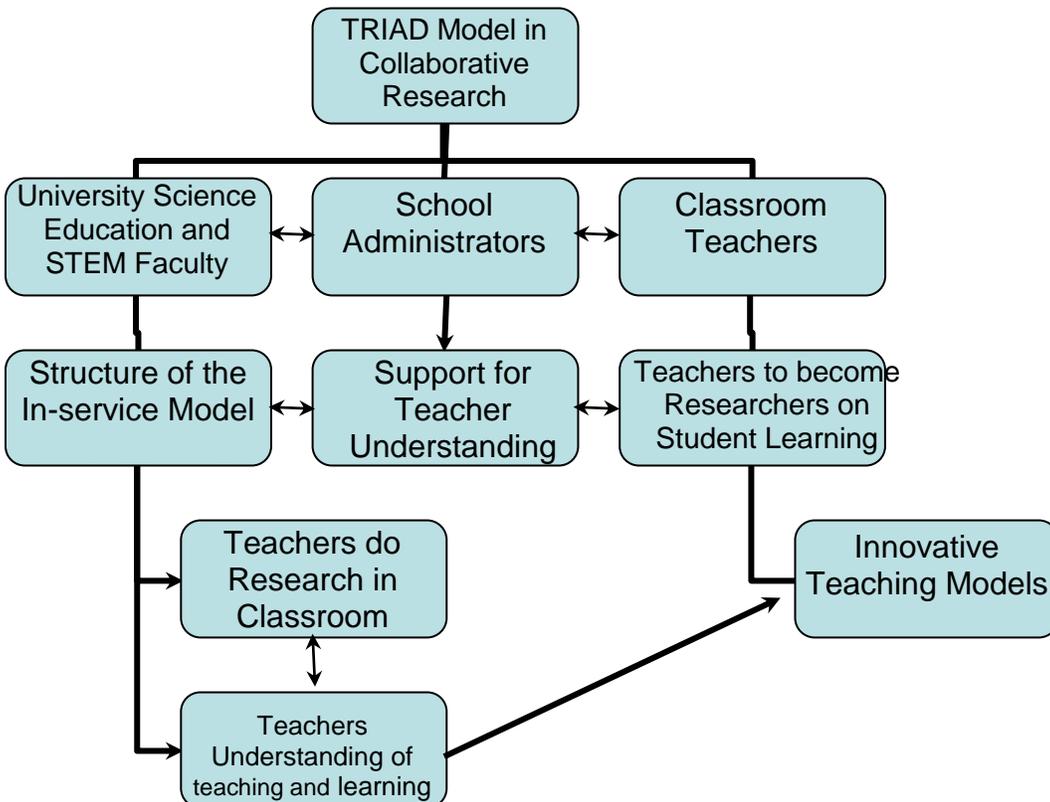
- Dr. Art Bangert, Associate Professor, MSU-Bozeman
- Dr. Delena Norris-Tull, Professor, University of Montana -Western

Project Evaluators:

- Dr. Phyllis Ault, Education Northwest
- Dr. Michael Coe, Cedar Lake Research
- Dr. Michael Scarlett, MSU-Billings

Section 3b: Research Base

The MPRES project design is built around the TRIAD Model in Collaborative Research (Miller 1993; Miller 2001). The design of the TRIAD model includes a richness of variables the literature indicates as prominent components of an in-service program. Identifying the impact of this model on teachers’ attitudes, students’



attitudes toward science, and the teachers’ sense of empowerment, confidence and ability to teach inquiry science would contribute toward the body of research on teacher in-service programs.

In the TRIAD Model of Professional Development **teachers** are involved as

researchers in their own classroom (Johnson 1993; Johnson 2002). The teacher is given the prerogative that a member of any profession ought to have—the right to make key decisions affecting one’s own work. This model helps teachers to make decisions based on the curricular innovations and inquiry-based instructional strategies involved in their own classroom. As they endeavor to draw conclusions based on their own action research, it is anticipated that they will also refer to the research findings of others and construct an in-depth understanding of specific aspects of teaching and learning (Tobin 1989; Herzog 1990; Brown & Smith 1999; Miller & Davison 1999; Loucks-Horsley et al. 2003; Stepan & Saigo 2006). Learning is the key factor on which a new way of teaching should be based, becoming a complementary resource to the child and offering multiple options, suggestive ideas and sources of support. Learning and teaching should not stand on opposite banks and just watch the river flow by; instead, they should embark together on a journey down the water. Through an active, reciprocal exchange, teaching can strengthen learning and how to learn.

University **Science Education and STEM faculty** will work with the trainers and classroom teachers to facilitate an understanding of the Framework for K-12 Science Education and the practices of inquiry model based upon the Framework for K-12 Science. During the course of the **Year 1**, the Next Generation Science Standards will become an integral part of the work with the trainers. In addition, the Common Core Standards are in the adoption phase for Montana. The project leaders will work with the Math-MSP project leaders to ensure continuity between the Common Core and the NGSS. University personnel will provide the structure and support for interactions between administrators and teachers in an attempt to provide opportunities for teacher reflectivity, peer coaching, the development of professional learning communities in their schools and in the region, and greater teacher ownership of the teaching of science as it relates to teacher empowerment. Fullan et al. (1990) commented that “sustained, cumulative improvements at the classroom and school level” are important, “but each and every teacher in the school is required to meet the challenge of our collective vision of the potential of schools” (p. 18). Teachers should not be asked to accomplish this collective vision alone. The difficulty could be characterized as walking a fine line between facilitating and mandating positive change.

University faculty and administrators have for decades dealt with the latter. If universities are truly interested in transforming school culture, they must begin by providing the tools, resources, and experiences necessary for the teacher to generate the changes. In addition, teachers must be offered help to increase their understanding of the teaching and learning process. The teacher must construct their own understanding of inquiry-based teaching strategies, hierarchical power, and school culture. University faculty and administrators must support development of teachers in this fashion and in turn benefit from their work with teachers.

The **building administrator** is the third person in the TRIAD partnership. The active and appropriate role of the administrator is very important, as it can maximize the effect of this TRIAD model, and represents a symbiotic relationship with the teacher. Participation in this TRIAD by the administrator provides the support and encouragement to effect teacher experimentation in the classroom. The pattern of administrator-teacher relationships is often paternal and hierarchical such that principals frequently end up in dominating roles in out-of-school classroom in-service experiences. Yet the administrator is the vital change agent in the school setting. The administrator has the ability to bridge context and school, policy and program. The administrator's importance emerges from that position: He/she has the greatest access to the wants and needs of teacher, students, district leaders, parents and community members (Dwyer et al. 1987; Bray 2002; Steele et al., 2006). Trainers involved in this program will learn how to develop effective working relationships with principals.

Building the TRIAD partnership between education leaders ensures that there is a top-down and bottom-up approach for the professional development. Effective systems-based approaches have called for such a system for implementation, citing that grass-roots approaches which are supported by the various levels of management are often most effective. In addition, alignment of the core purposes of a given scale-up activity through the state system, local system, building administrator, and teacher is critical to successful rollout (Fixsen et al. 2005).

Blended Learning Model for Professional Development: Research on blended learning models for professional development suggests that such an approach can clearly enhance the content and pedagogical knowledge of teachers. As it is typically defined, a blended learning environment combines “some face-to-face instruction where learners are co-located, with web-based instruction where they are not in the same location” (Oweton et al. 2008). The purpose of blended learning models is to provide teachers the opportunity to interact with peers over significant periods of time to develop knowledge and skills while remaining in their classrooms. The project will utilize STEM and Education faculty for facilitation of the online course, and therefore will enable university faculty to monitor learning and provide feedback online to teachers in the field.

On-site, face-to-face sessions are also an important component in the blended learning model. In several of the two PI’s previous projects, Technology Innovation Challenge Grant (Miller & Knuth 2003), Southwest Montana Science Partnership Grant (Ault & Coe 2010), and PRISM MSP grant (Scarlett 2011) the PI’s found on-site face-to-face meetings to be very valuable. Cohort members involved in this blended learning program developed learning communities and collegial interactions with face-to-face workshops that carried into the online learning formats in a very positive manner (Miller & Knuth 2003).

Inquiry Science: In their prior projects, Dr. Ken Miller and Rayelynn Connole learned that open inquiry, while an extremely effective pedagogical tool for teachers, is not always required for meaningful learning to occur. Having studied under the auspices of several hands-on teaching models-- Robert Karplus and the Learning Cycle; Roger Bybee and the 5E model; and Anderson et al. and the Conceptual Change Model-- the inquiry continuum that researchers discuss in this new century is a natural evolution. Some researchers suggest the inquiry continuum to be as simple as "structured inquiry", "guided inquiry", or "student-initiated inquiry" (NWREL 2007). The Framework builds upon these understandings and discusses the 'practices of inquiry' as the central underpinning of the Next Generation Science Standards (~Spring, 2013). The STEM initiative is a further step toward integrating Science Technology Engineering and Mathematics to make learning meaningful and to prepare students to be college and career-ready to enter STEM fields. The national understanding of

Section 3: Partnership Operational Narrative

inquiry has evolved over the past two decades. Two documents preceding the Framework were Taking Science to the Classroom: Learning and Teaching Science Grades K-8 (Duschl et al. 2007) and The National Science Education Standards (NRC 1996). While both works discussed the abilities of inquiry science and the need for teachers to teach children those inquiry skills, they did not go far enough toward helping teachers to understand “How” to teach inquiry. With the advent of the Framework for K-12 Science Education and the eventual Next Generation Science Standards, we can begin the process of helping teachers to understand the nature of science, and the pedagogy of science inquiry, through the three dimensions of the framework. These dimensions are (1) Scientific and Engineering Practices, (2) Crosscutting Concepts, and (3) and Core Ideas. For a pre-service or in-service teacher to be knowledgeable about teaching science, they must be literate regarding these three dimensions, understand the pedagogical implications of the three dimensions, and be able to apply those three dimensions in the classroom. Through these dimensions, a new vision of science education emerges that embraces different ways of thinking about science, different ways of thinking about students, and different ways of thinking about science education. The K-12 Framework for Science Education is not just another reform initiative, rather it is an entire paradigm shift that requires purposeful integration of curricula, highly trained teachers, and aligned system initiatives all working together to support the students’ growth in science.

Section 3c: Needs Assessment

The project PI’s, Dr. Ken Miller and Rayelynn Connole, have recently completed MSP projects, in which data regarding the baseline needs for teacher professional development were collected. In both projects, baseline data clearly indicated that elementary teachers in particular feel unprepared for teaching science. Although Montana currently has less than 2% of teachers who do not meet the requirements for a “Highly Qualified Teacher”, it is uncertain that HQT status implies that teachers are ready to effectively teach science curricula across the grade bands, especially integrating work across the three dimensions recommended by the Framework. Throughout the course of the previous MSP projects, both project directors noted that teacher development of inquiry skills required intensive training, including targeted time for reflective practice within the classroom. The proposed

project ensures that teachers are given job-embedded training through the creation of trainer-hosted monthly PLC meetings.

Throughout the National Research Council's, A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas, recommendations for teacher professional development in rich content and understanding of the nature of science are prevalent. The NRC calls for coherence in the system of education as related to science, which specifically reminds education leaders to align standards, assessments, curricula, and classroom practices (NRC 2012). The proposed MPRES project creates effective, working partnerships with the MT OPI leaders, the RESA leaders, and LEA leaders, affording system continuity. The project plan calls for refinement and feedback of the training program by all partners, thereby, creating individual and system-wide buy-in for the training program.

The NRC specifically notes that, “instruction throughout K-12 education is likely to develop science proficiency if it provides students...inquiry and investigation, collection and analysis of evidence, logical reasoning, and communication and appreciation of information” (NRC 2012). The proposed project allows for rich exploration of specific topics and specifically targets the nature of science and development of science framework practice skills. Teachers who have not experienced development of a research question, conducted an experiment, analyzed data, and presented findings are ill-prepared to lead their students through such practices. In the short term, Montana teachers will quickly need to develop basic skills for conducting investigations. In the long term, content-rich rigorous research opportunities for teachers could prove a valuable method for increasing teacher confidence toward the Next Generation Science Standards. The proposed training program offers quality experiences for the trainers who will in-turn be able to lead their colleagues through similar development experience.

Section 3d: Project Plan

The Montana Partnership with Regions for Excellence in STEM (MPRES) project partners will build upon two successfully implemented MSP projects, the PRISM project from Montana State University-Billings and the SMSP project from Montana Tech. This project will utilize the existing online modules and

exemplar lessons developed during the previous projects. The online learning modules will continue to be place-based, with particular emphasis on highlighting cross-cutting concepts in science. Each module provides teachers the opportunity to practice inquiry pedagogy and science framework practice skills by requiring teachers to engage in an experimental project. The content is delivered via the blended learning model, which has proven effective in both prior projects. The model provides for both top-down and bottom-up approaches to the professional development by engaging teachers at the classroom level and engaging instructional leaders at the district and building level.

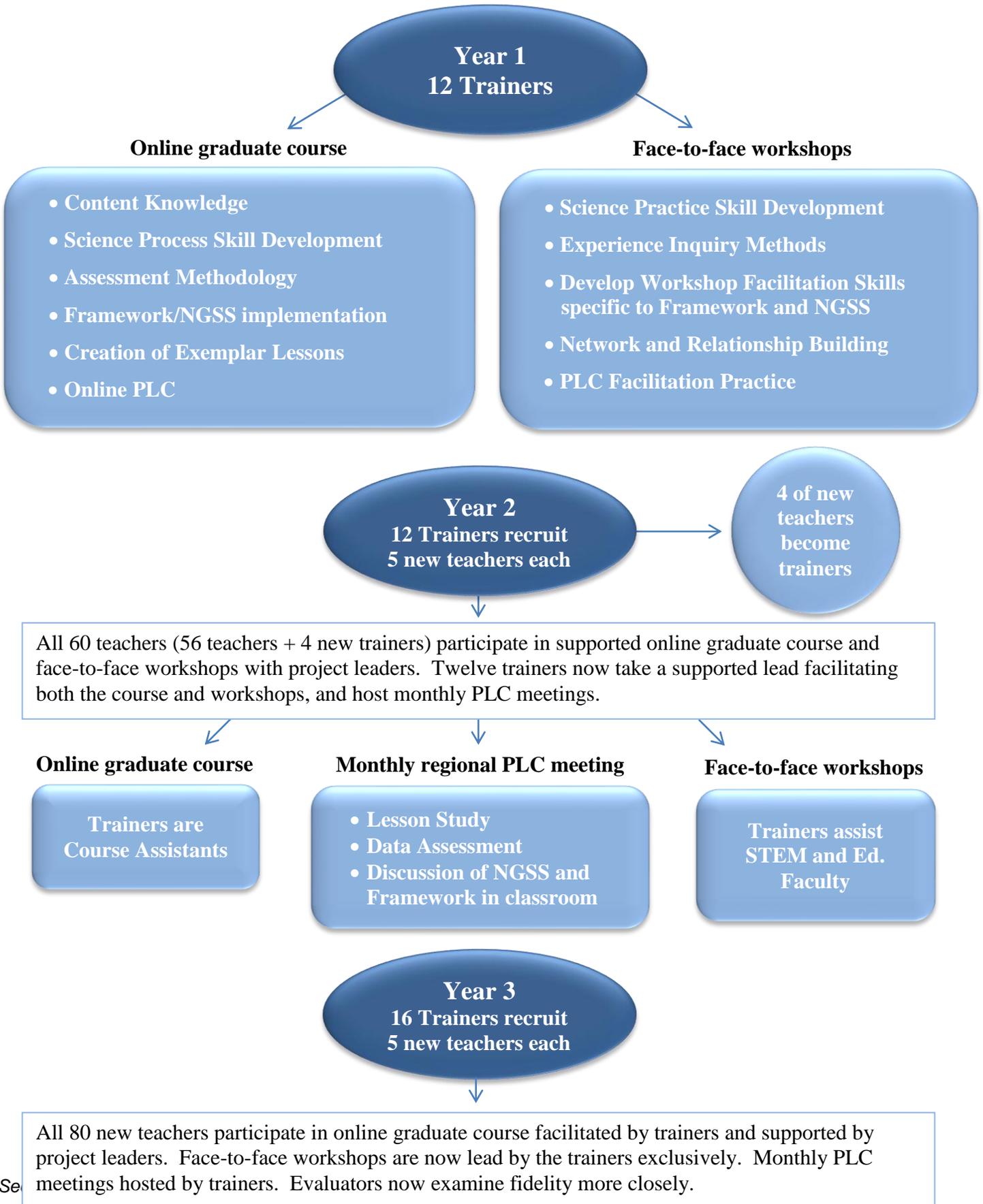
The MPRES project will utilize a **Train the Trainer** model to scale-up the previously funded MSP work. As depicted on page 19, twelve teachers who have previously participated with the MSP projects, and are considered to be advanced in their skills and abilities with inquiry pedagogy and science content, will be recruited as trainers in **Year 1**. In subsequent years, four additional teachers who may or may not have participated in an MSP project but are recommended as high-quality science teachers will be recruited as trainers. These new trainers will be trained by the first-year trainers in order for the project partners to assess if it is reasonable for teacher-trainers to prepare new trainers or if there is need for continued support from MSP project partners to do the initial training.

Trainers will complete a year-long process of professional development which will continue to focus on content knowledge, science process skill development, and pedagogical skill development, as well as instruction specific to the Framework and emerging NGSS, techniques for implementing within the classroom, and development of specific facilitation skills. In addition, trainers will participate in an online professional learning community with their fellow trainers across the state. This online PLC will enable the project leaders to assist the trainers with development of leadership skills specific to leading instructional work groups in their areas, provide a platform for discussion of obstacles and concerns, and ensure that teacher-trainers build relationships with STEM and Education faculty members. During **Year 2** of the grant, the 12 teacher-trainers will each recruit five teachers from their respective regions, for a total of 60 new teachers gaining the

professional development. Four of these new teachers will be trained as trainers. During **Year 3**, all 16 trainers will recruit another cohort of teachers for the project for a total of 80 new teachers in **Year 3**. All totaled, the project will develop 16 trainers who provide professional development for 136 teachers, for an absolute total of 152 teachers receiving professional development.

After trainers have completed their initial year of coursework and online mentoring, they will recruit five new teachers to train. The training for new teachers will consist of the following components: 1) Online graduate course with Dr. John Graves; 2) Face-to-face workshops with the trainers which will be supported by the project leaders; and 3) monthly PLC meetings with the trainers in their region. The online course will provide a backbone and consistent meeting place for the teachers. Please refer to page 19 for more details about course content. The trainers will be Course Assistants with Dr. John Graves and eventually should be able to utilize the online modules within their areas without the support of education and STEM faculty members. The face-to-face workshops will allow the trainers to continue to build their skills as facilitators and deepen their networks with STEM and education faculty members, as well as providing excellent PD for teachers new to the MSP project. The monthly PLC meetings will be designed to help teachers embrace the Framework and NGSS within their own professional practice and begin developing collegial relationships within their areas. The PLC meetings will be structured to support lesson study, analysis of student data, effective use of assessment, and support for making changes within the school. The PLC meeting will ensure time for reflective practice within the classroom.

In **Year 3** of the grant, support from the project leaders for workshops will be scaled back in order to assess how effectively trainers are able to implement the PD program. The project leaders will evaluate implementation fidelity of **Year 3** (scaled-back support), as compared to **Year 2** (full support). This study will help to assess what barriers and obstacles there are to implementation and help to determine if the **Train the Trainer** model is effective. The project plan for dissemination of findings can be found in Section 4: Project Evaluation.



Project Timeline

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 1 Oct 2012-Sept 2013												
Recruiting/MOU's in place for districts									2012			
Project Launch Meeting with Partners										2012		
Module Development by STEM and Ed faculty									2012	2012	2012	2012
Workshop #1 with Trainers										2012		
Online Course Begins											2012	
Workshop #2	2013											
Project Leaders to MSP Conference		2013										
Workshop #3				2013								
Workshop #4						2013						
CPT Meeting and Evaluation Oversight Mtg						2013					2012	
YR 1 Trainers Symposium/Leadership Mtg						2013						
Year 2 Oct 2013-Sept 2014												
Recruiting/MOU's in place for districts								2013				
Workshop #1 with Trainers and new Teachers										2013		
Online Course Begins											2013	
In-region PLC meetings	2014	2014	2014	2014	2014						2013	2013
Presentations at MCEL and MEA/MFT mtgs										2013		
CPT Meeting											2013	
Workshop #2	2014											
Trainers and Project Leaders to MSP conference		2014										
Workshop #3				2014								
Workshop #4						2014						
CPT Meeting and Evaluation Oversight Mtg						2014						
YR 2 Trainers Symposium/Leadership Mtg						2014						
Year 3 Oct 2014-Sept 2015												
Recruiting/MOU's in place for districts									2014			
Workshop #1 with Trainers and new Teachers											2014	
Online Course Begins											2014	
In-region PLC meetings	2015	2015	2015	2015	2015						2014	2014
Presentations at MCEL and MEA/MFT mtgs										2014		
CPT Meeting											2014	
Workshop #2	2015											
Trainers and Project Leaders to MSP conference		2015										
Workshop #3				2015								
Workshop #4						2015						
CPT Meeting and Evaluation Oversight Mtg						2015						
YR 2 Trainers Symposium/Leadership Mtg						2015						
Conferences/Workshops (as available)							2015	2015				
Publications								2015	2015			

Please note: Evaluation Activities are outlined in the evaluation section.

The MPRES project directly supports the Office of Public Instruction's goals for the MSP program as outlined in the introduction section of the partnership operational narrative. In addition, the partners have identified the following **specific project goals**:

- 1) Increase teacher content knowledge and pedagogy skills, with particular emphasis on the Framework and how to implement it within the classroom.
- 2) Establish effective, sustainable professional development for the Next Generation Science Standards, utilizing the **Train the Trainer** model.
- 3) Evaluate the efficacy of the model, potential risks to fidelity of program implementation, and barriers to effective professional development in the regions.
- 4) Establish a blended learning course structure for pre-service teachers that will be utilized on the campuses of Montana State University-Bozeman and Montana State University-Billings.
- 5) Build upon the two projects' successful online modules by creating three additional modules: 1) Inquiry Science Pedagogy and the Development of Science Framework Practice Skills; 2) The Framework and Next Generation Science Standards: How to Implement in the Classroom; and 3) Engineering Design and Cross-cutting Concepts in Science.
- 6) Provide six graduate credits for in-service teachers involved in the project.

The MPRES partners form a synergistic unit with clear **roles and responsibilities for each member**:

1. Montana Tech/Cfwep.Org Responsibilities:

- Program oversight and budget management
- Main liaison between Western Montana partners
- STEM instruction by science, technology, engineering and math faculty members
- Development of additional online modules for engineering and cross-cutting concepts
- Website development, support and oversight
- Module and lesson re-formatting and revisions
- Science and engineering resource hub
- Hosting workshops

2. Montana State University-Billings Responsibilities:

- Provide science inquiry and leadership mentoring
- Development of inquiry and Framework modules
- Main liaison between Eastern Montana partners
- Budget oversight for teacher trainer needs

3. Montana State University-Bozeman Responsibilities:

- Provide science inquiry and leadership mentoring
- Development of inquiry-based online learning modules
- Host online graduate course
- Follow-up pedagogical support and mentoring for teachers and STEM faculty
- Coordination with the Burns Technology Center

4. LEA Responsibilities:

The project leaders have engaged the following LEA groups for partnership in the grant: Butte School District; Billings School District; Montana Educational Consortium; ACE Consortium; Bozeman School District; and Anaconda School District. Each LEA group will be responsible for the following:

- Provide administration member for Core Planning Team meetings
- Recruit teachers to participate in MPRES project
- Coordinate MPRES rollout activities with other district initiatives
- Allow teachers release time to participate in workshops and other program offerings
- Allow teachers to provide feedback and mentoring to one another throughout the course of this MSP program

5. RESA Responsibilities:

As required by the RFP, each RESA is also a named partner in the grant. In **Year 1**, RESA4U and MRESA III will have more responsibilities than the other three regions. RESA4U and MRESA III will assist the project leaders with assessment of program efficacy and fidelity within the area schools. RESA 4U and MRESA also have responsibility for co-creation of the training modules. The RESA partners will provide on-going feedback to the project leaders regarding the training program.

In subsequent years, all five RESA's will have the following responsibilities:

- Participate in Core Planning Team meetings
- Provide needs assessment data
- Provide direction and leadership regarding the online training modules efficacy
- Monitor the regional trainers
- Collaborate with area school districts to coordinate district professional development opportunities with MPRES professional development
- Assist with teacher-trainer and teacher recruitment for the project

6. Education Northwest/Cedar Lake Research

- Participate in Core Planning Team meetings via conference call
- Program evaluation
- Convene evaluation advisory board meetings annually
- Provide formative feedback throughout the project

Section 3: Alignment with K-12 Framework for Science Education

The Dimensions of the Framework guide the project activities and goals. The previously developed modules from both the PRISM and SMSP projects will be utilized in this grant cycle. In addition, three new modules specifically aligned with the Framework will be developed by the Education and STEM faculty members. The Train the Trainer model will follow in close alignment with the design of the framework. The face to face workshop activities to develop understanding of the Framework and the NGSS with the trainers each focus on an individual dimension from the Framework. The culminating workshop will help the trainers to understand how each dimension is integrated and infused into the teaching and learning process.

Dimension 1: Scientific and Engineering Practices--Dr. Doug Coe has committed STEM faculty members from Montana Tech for the writing of the online module for Dimension 1. This module will focus on the nature of science, development of science framework practice skills, and engineering practices for the classroom. This module will have a second round of revision in **Year 2** once trainers have implemented the concepts illustrated in the module within their classrooms.

Dimension 2: Cross-cutting Concepts in Science--A new module specific to integration of cross-cutting concepts throughout the science curricula will be developed by Dr. John Graves and Dr. Ken Miller with support from Montana Tech STEM faculty and the trainers. This module will illustrate how the seven cross-cutting concepts can be examined throughout a particular grade-band, including planning for scope and sequence within the science curricula.

Dimension 3: Disciplinary Core Ideas--The online modules previously developed in both the PRISM and SMSP projects provide the backbone of content for Dimension 3. The SMSP modules are content specific and

engage teachers in a field study program. As teachers progress through the modules, they develop science framework practice skills necessary for carrying out a field study. The SMSP content modules will have another revision which will highlight the cross-cutting concepts illustrated in each module. The PRISM modules and exemplar lessons provide teachers with an excellent starting point for adoption of new content within the classroom and an opportunity for reflective practice regarding their personal understanding of the content and the pedagogical approaches for facilitating particular content.

Section 3f: Coordination with Other Existing Programs and Initiatives

The project will work closely with all five RESAs to determine existing programs and initiatives in the regions that provide effective professional development to teachers. Coordination with the RESAs will include outlining the facilities and services they can provide for professional development that will promote the project. The RESAs will help identify and recruit teachers to participate in the project, disseminate information, and evaluate the project in relation to other effective existing programs. The project will work more intensively in **Year 1** with RESA4U and MRESA3 to evaluate the efficacy of the training model and the systems approach. During **Year 2**, the other three RESA's will collaborate and participate at a higher level of engagement once the logistics and coordination of trainers is established.

The Science Education and STEM faculty will examine the effectiveness of the MT STEM initiative in Montana schools and will provide support to teachers in a blended learning format-- online courses and face-to-face workshops with an emphasis on science content and inquiry. The project will provide on-going support and leadership for the STEM initiative by helping to strengthen teacher preparation programs and improving STEM education in Montana. The project's modules will focus on the Next Generation Science Standards and K-12 Framework for Science Education with an emphasis on science inquiry and process skills. A network will be established to enhance partnerships between schools and STEM faculty.

Cfwep.Org is currently funded by the Montana NRDP for a five-year contract and will coordinate on-going professional development initiatives with MSP. Cfwep.Org was recently awarded an *Office of Public*

Instruction Museum and School Collaborative Grant to Integrate Indian Education for All Grant. Artifacts and lessons developed through this project will be made available to the MPRES teachers.

Section 3g: Management Capability

Ample capacity to effectively see the project through from beginning to end is demonstrated not only by the strength of the partnership, but also by the commitment of the core partner institutes to educational achievement. The project partners have extensive experience in curriculum development and delivery in the areas of science content, science inquiry, environmental science, outdoor education and online learning environments. Prior successful implementation of similar programs by the project leaders also demonstrates management capability.

Montana Tech: Over the past six years, Montana Tech's Rayelynn Connole has served hundreds of teachers and other professionals through her MSP projects: the Clark Fork Watershed Science Education Partnership (CFWSEP); two continuation grants of CFWSEP; the Southwest Montana Science Partnership (SMSP); and one continuation grant of SMSP. Ms. Connole is a member of the MT-STEM initiative team. She has previously been a Butte School District #1 Trustee and a Municipal Director for the Montana School Boards Association. She brings excellent leadership and understanding of state-wide educational systems. Ms. Connole has been able to effectively maintain partnerships across the state of Montana, which enables her to bring together a diverse and talented team.

Montana Tech has a long-standing history of providing excellent preparation of students in the STEM disciplines. With the collaboration of key STEM faculty Dr. Colleen Elliott, Dr. Marisa Pedulla, Dr. Arlene Alvarado, Dr. David Hobbs, Dr. Michelle Anderson, and Dr. Delena Norris-Tull, the content module development related to engineering principles and cross-cutting concepts in science is assured to be exceptional. Montana Tech's STEM faculty members involved in the project have published in education journals in addition to publications in their discipline, demonstrating their dedication to the improvement of science education in Montana. Montana Tech will be the fiscal agent for the project and has ample infrastructure to support a grant of this scope and size.

MSU-Billings: MSU Billings has the technological infrastructure and platform as well as the faculty and staff experience to develop and support a blended learning program. Dr. Ken Miller has taught online programs for the past ten years. His latest related research-based article is titled “Teaching Science Methods Online: Six Myths about Inquiry-based Online Learning” (Miller 2008). As one of the developers of the Montana Content and Performance Standards Guided Inquiry Model, Dr. Ken Miller adds a wealth of knowledge on inquiry science which can be used to present online content with STEM faculty. As a member of the task force to design the Montana Science Inquiry Continuum, a member of the State STEM Task Force, and the Project Director for the state recognized PRISM project, Dr. Ken Miller is recognized in Montana as an expert and leader in the understandings of an inquiry based approach in the teaching of science. Dr. Miller has published extensively in the area of integration with over 15 articles on those topics alone and brings a plethora of knowledge to this project

MSU-Bozeman: Dr. John Graves leads the Masters of Science in Science Education (MSSE) program at MSU. Dr. Graves has provided numerous online courses and was named MSU’s Online Educator of the Year in 2012. He represented Montana at the Science Framework Review in Seattle in the summer of 2010, reviewed the December 2011 Draft of the NGSS in Seattle at NSTA, and was on the National Congress for Science Education Planning Committee that planned the 2012 Congress centered on the NGSS Draft, held in Albuquerque, NM. As NSTA's Direct 15 Director, he is involved in national level discussions about NGSS on a regular basis. Dr. Graves is a current member of the MT-STEM initiative leadership team.

Dr. Arthur W. Bangert is an Assistant Professor of Education in the College of Education, Health and Human Development at Montana State University. Dr. Bangert has conducted numerous evaluations for state technology grants awarded to school districts in Idaho and Montana. His current research interest is focused on investigating factors that contribute to the design of effective online learning environment.

Section 3h: Communication and Interaction:

The project leadership team from MSU-Billings, MSU-Bozeman, and Montana Tech will convene monthly conference calls in order to ensure timely progress and development of the grant project. Core Planning Team (CPT)

meetings will be convened twice per year. The CPT meeting will involve all partners from the LEA's and RESA's. The focus of the CPT meeting will be to report on the project progress and seek feedback and direction from the LEA and RESA partners, ensuring that the project is meeting the partners' needs. A stipend for each meeting will be paid to all CPT members to ensure that team members' expenses are covered. Annual reports will be shared with all CPT members.

In addition to the monthly leadership meetings and the bi-annual CPT meetings, the leadership team will meet with the evaluation advisory board two times in **Year 1** and annually in **Year 2** and **Year 3**. The evaluation advisory board will report findings to date and give direction to the leadership team regarding the fidelity and efficacy study. The purpose of the evaluation advisory board meeting separate from a CPT meeting is to ensure that the project leaders are moving toward their stated outcomes, that formative feedback can be given in an open format, and that adjustments to the project plan can be made readily.

After **Year 1**, one trainer from each region will join the CPT meetings. Two trainers will be invited to attend the annual MSP conference and will be expected to report to their colleagues regarding the conference. In **Year 3**, trainers will join the evaluation meeting in order to assess future direction and continuation of the training program past the grant cycle.

Section 3i: Leadership Involvement

The RESA partners will assist with recruitment and selection of teachers who will become trainers for the project. After **Year 1**, the RESA partners will again assist the new trainers with recruitment of teachers for professional development. Throughout this process, RESA partners will establish collaborative relationships with building and district administrators. The project leadership team members and the RESA partners will convene an annual RESA Director and School Leadership Meeting for district administrators, participating teachers and the project partners. The focus of this meeting will be to share successes and lessons learned in the regions and establish a network of professionals working toward NGSS implementation. STEM faculty partners will be included in the annual leadership meeting, allowing for further outreach opportunities for area schools.

By deliberately facilitating the development of relationships between RESA, IHE and LEA partners, the project partners ensure greater collaboration between the various entities. The area trainers and teachers will share their findings and exemplar lessons in a symposium at the annual meeting. This activity will ensure that there is ample opportunity for bottom-up development of effective practices within the partner schools. Teachers and trainers will be afforded time to network with the RESA partners and the area school leaders, which will enable them to foster collaborations.

LEA partner leaders and RESA leaders will be given time to share their concerns, obstacles, and needs with the project leadership team. Information and feedback will be formally gathered by the evaluation team during focus group interviews. This process will ensure that the project is responsive to the needs of each area.

Section 3j: Implementation and Sustainability of Professional Development

Throughout the course of the project, implementation fidelity will be studied by the project leaders. First, the viability of trainers being able to effectively create new trainers will be evaluated. Second, the fidelity of program implementation from the trainer to teacher and eventually to classroom practice will be examined in **Year 2** and **Year 3**. As the project progresses, newly developed trainers will gradually step into the leadership roles for the online course and workshop facilitation. In **Year 3**, the project leaders will ultimately be providing limited support for the trainers and will be evaluating the outcomes for new teachers trained in the system.

The online modules developed by Montana Tech in the previous MSP project have a measure of field testing done to date. Nearly all of teachers involved in the past project reported that they continue to refer to the online modules and use them directly in their classrooms. It is expected that the new online modules developed for MPRES will be equally valued by teachers. Trainers will be allowed to use the modules, which are currently housed at **redmtcommunicatins.com** and will be at **sciencepartners.info** as needed past the grant cycle.

Both Montana State University campuses have agreed to host the online graduate course past the grant cycle. Dr. Ken Miller and Dr. John Graves are seeking to add the MPRES course to their course catalogues for pre-service teachers. The use of the course for pre-service teacher preparation will enable new teachers to enter the classroom better prepared for the NGSS than their practicing counterparts.

Section 4: Partnership Evaluation and Accountability Plan

External evaluation and accountability of the MPRES project will be conducted by a team of professional evaluators at Education Northwest in the Center for Research, Evaluation, and Assessment. The evaluation plan for MPRES will provide a comprehensive assessment of project accomplishments with multiple data collection and analysis methods to provide triangulated formative feedback and assess the overall success of the project. The following table lists the primary evaluation research questions which are connected to project goals.

Evaluation Research Questions

1. To what extent does participation in MPRES increase participants' knowledge, pedagogical skills and leadership potential related to the effective use of the *Framework for K-12 Science Education* (NRC 2012)?
 2. To what extent does participation in MPRES reinforce/increase participants' science content knowledge?
 3. How does MPRES collaborate with the RESA network and engage district administrators to scale-up impact?
 4. How effective is the teacher trainer model in achieving intended outcomes?
 5. What is the influence of teacher participation in MPRES on student content knowledge?
-

a. Partnership Assessment: Drawing from the evaluation team's experience and respect for a diversity of expert views, we will employ a strategy for assessing overall partnership progress using an Evaluation Advisory Board. The Evaluation Advisory Board will review data collected by the project, engage as critical friends to prompt reflection and continuous improvement, and then compile comments in post-review memos summarizing suggestions/considerations offered by the group. The board will be comprised of an evaluator from Education Northwest, an evaluation and research consultant, a science education researcher, a Montana science education faculty member, and an expert in online learning. The board will convene four times during

the scope of the project; twice in **Year 1** (October and June), and annually in June during **Years 2 and 3**. The aims are to actively involve project leaders and regional partners in self-assessment and optimize the quality and use of data for continuous improvement. This strategy will provide information on Thomas Guskey's five critical levels of evaluation (Guskey 2000).

b. Summative Evaluation: Several methodologies will be used for the summative evaluation of MPRES.

(1) To measure changes in teachers' pedagogical skills, the primary outcome measure will be the University of Wisconsin Survey of Enacted Curriculum (SEC), which is aligned with project goals. The nationally-validated SEC will be administered at baseline, annually, and at project end (addressing Guskey's second through fourth evaluation levels of professional development: participant learning, organizational support and change, and participant use of new knowledge and skills). (2) Annually, focus groups will be conducted with teacher trainers and participating teachers during the June training (also addressing Guskey's second through fourth evaluation levels). Using a semi-structured protocol, questions will focus on specific grant goals and progress toward achieving those goals. (3) An annual online survey will be used to assess the level of engagement of Regional Education Service Areas (RESAs) and participating district administrators (Guskey's third evaluation level). Questions will probe the project's efforts in developing statewide capacity to deliver professional development. (4) Student learning outcomes will be measured through review of teachers' SCOOP notebooks (Borko et al. 2007) submitted in conjunction with the online course. These robust collections of material from teachers will be compiled annually and include teachers' unit plans, materials, and documentation of student achievement. Initial review and feedback will be provided by an experienced independent contractor using the rating guide developed by the National Center for Research on Evaluation, Standards, and Student Testing (CRESST). The Advisory Board will conduct a synthesis of the Scoop notebook results and compile a synopsis of student learning outcomes provided in the evidence (addressing Guskey's fifth level of evaluation of professional development: student learning outcomes).

c. Feasibility of Using an Experimental Design: The evaluation design described in this proposal was carefully selected to provide high quality, actionable formative feedback and reliable summative information. MPRES has not previously implemented the envisioned project as a statewide partnership. Ongoing formative feedback will be essential to the success of the project, informing mid-course adjustments to the program in order to maximize successes and mediate challenges. This makes either an experimental design or quasi-experimental design premature at this point.

Under previous funding, Education Northwest conducted an experimental study with random assignment of teachers to one of two cohorts for one of the MPRES partner programs. Evaluators encountered several challenges associated with using a true experimental design in that context. Foremost among these challenges was the need to for the project to maintain fidelity of implementation across cohorts of teacher participants. The unintended consequence of this need was to restrict revisions to the professional development model that might have emerged in response to formative feedback. By design, in its first three years MPRES will be continuously refined in response to formative feedback. This developmental stage of the model lends itself to evaluation for ongoing continuous improvement rather than a controlled experiment of a fixed, standardized intervention. In short, the MPRES program model will still be in refinement during this project rather than being a finalized, static model appropriate for testing in new settings using experimental studies.

The use of matched or non-matched comparison groups would also not be appropriate in this context. The aim of the project is to reach teachers statewide through an implementation that grows over time. Therefore no comparison groups would be possible within the timeframe of the grant.

Another consideration is cost. Implementing an experimental or quasi-experimental design, with adequate statistical power, would not be feasible considering the budget set aside for evaluation. Even if the program model was fully established and standardized and had been previously studied in its new form, the cost of conducting a high quality experimental study with extensive outcome data from specialized teacher and student measurement instruments would be prohibitively expensive.

d. Formative Evaluation: The project partners will meet regularly to review progress in terms of the project timeline, planned activities, and implementation benchmarks such as numbers of participants and accomplishment of tasks on time and on budget. As mentioned earlier, the Evaluation Advisory Board will also meet bi-annually in **Year 1** and annually in **Years 2-3** to provide feedback based on data up to that point in the grant. This advisory group will offer independent perspectives on progress toward achieving goals and recommendations for program and project improvement.

Most of the data sources described above related to the partnership and summative evaluation will also be used to provide regular formative feedback to project staff. As these data become available they will be discussed among the project team and used to make adjustments and corrections to project activities. In addition, brief feedback forms will be used after workshop events to gauge participants' reactions (Guskey evaluation level 1) and changes in content understanding. These will be administered and reviewed by project leaders to promote continuous improvement of the blended model and scale-up strategies. Embedded assessments of content knowledge are also included in the online modules. Results will be shared with partners and the evaluation team.

In addition, regular prompts will be posted through the online delivery system probing perceptions of all blended components of the project (face-to-face, distance learning through online modules and exemplar lessons, and leadership development components). Responses will provide project leaders with concrete information to make informed decisions about implementation and any warranted modifications.

Formative evaluation findings will be shared and disseminated during project meetings, phone conferences, and telecommunication. Evaluators will also compile formal annual reports to help benchmark progress toward achieving goals. Formative evaluation data will be available for inclusion in the project director's annual reports.

e. Match between Evaluation Design and Guskey

The following table shows Guskey's evaluation level, key questions, measures, domains measured, and how the information will be used.

Professional Development Evaluation

Evaluation Level	Questions to be answered	Measure	What is measured?	How will information be used?
1. Participants' Reactions	<ul style="list-style-type: none"> • Were teachers' needs for professional development met? • Did teachers enjoy the experience? • Did teachers feel their time was well-spent? • Did the material make sense? • Will it be useful? • Were presenters knowledgeable and helpful? 	<ul style="list-style-type: none"> • Feedback forms administered at the end of each workshop session 	<ul style="list-style-type: none"> • Initial satisfaction with the workshop experience 	<ul style="list-style-type: none"> • To improve professional development design and delivery
2. Participants' Learning	<ul style="list-style-type: none"> • Did trainers and teachers gain the intended knowledge & skills (e.g., science content knowledge, inquiry skills, leadership skills, knowledge of next generation science standards)? • How well did the blended learning course structure facilitate learning? 	<ul style="list-style-type: none"> • Surveys of Enacted Curriculum • Structured focus group interviews • Online prompts • Advisory Board review 	<ul style="list-style-type: none"> • New/increased knowledge and skills of participants 	<ul style="list-style-type: none"> • To improve instructional practice • To gauge the perceived impact of project professional development
3. Organizational Support & Change	<ul style="list-style-type: none"> • Were problems addressed effectively? • Is the implementation of place-based scientific inquiry teaching methods advocated, facilitated, and supported? • Were successes recognized and shared? • Was support public and overt? • What was the impact on schools? 	<ul style="list-style-type: none"> • Structured focus group interviews • Online survey of RESA and District Administrators 	<ul style="list-style-type: none"> • District advocacy, support, facilitation, and recognition for project, professional development • Effectiveness of project partnership • Statewide reach 	<ul style="list-style-type: none"> • To document and improve district and organizational support • To inform future change efforts • To better understand constraints on changing school practices • To assess the functioning of the project partnership
4. Participants' Use of New Knowledge & Skills	<ul style="list-style-type: none"> • Did participants effectively apply new knowledge and skills? • Did teaching practices change in intended ways (i.e. increased use of the inquiry method)? • Did teachers gain new leadership skills? 	<ul style="list-style-type: none"> • Structured focus group interviews • Embedded module assessments • Online prompts to Web system • Scoop notebooks 	<ul style="list-style-type: none"> • Implementation of place-based scientific inquiry teaching methods • Application of science content knowledge • Leadership skills 	<ul style="list-style-type: none"> • To improve instruction • To gauge the perceived impact of project professional development • To document and improve project content
5. Student Learning Outcomes	<ul style="list-style-type: none"> • What was the project's impact on students? • What changes do teachers observe in student learning (achievement, interest in science, engagement)? 	<ul style="list-style-type: none"> • Student data from Scoop notebooks • Structured focus group interviews 	<ul style="list-style-type: none"> • Student learning outcomes • Affective (attitudes and dispositions) • Content knowledge 	<ul style="list-style-type: none"> • To assess perceived impact of project professional development • To focus and improve program design and implementation

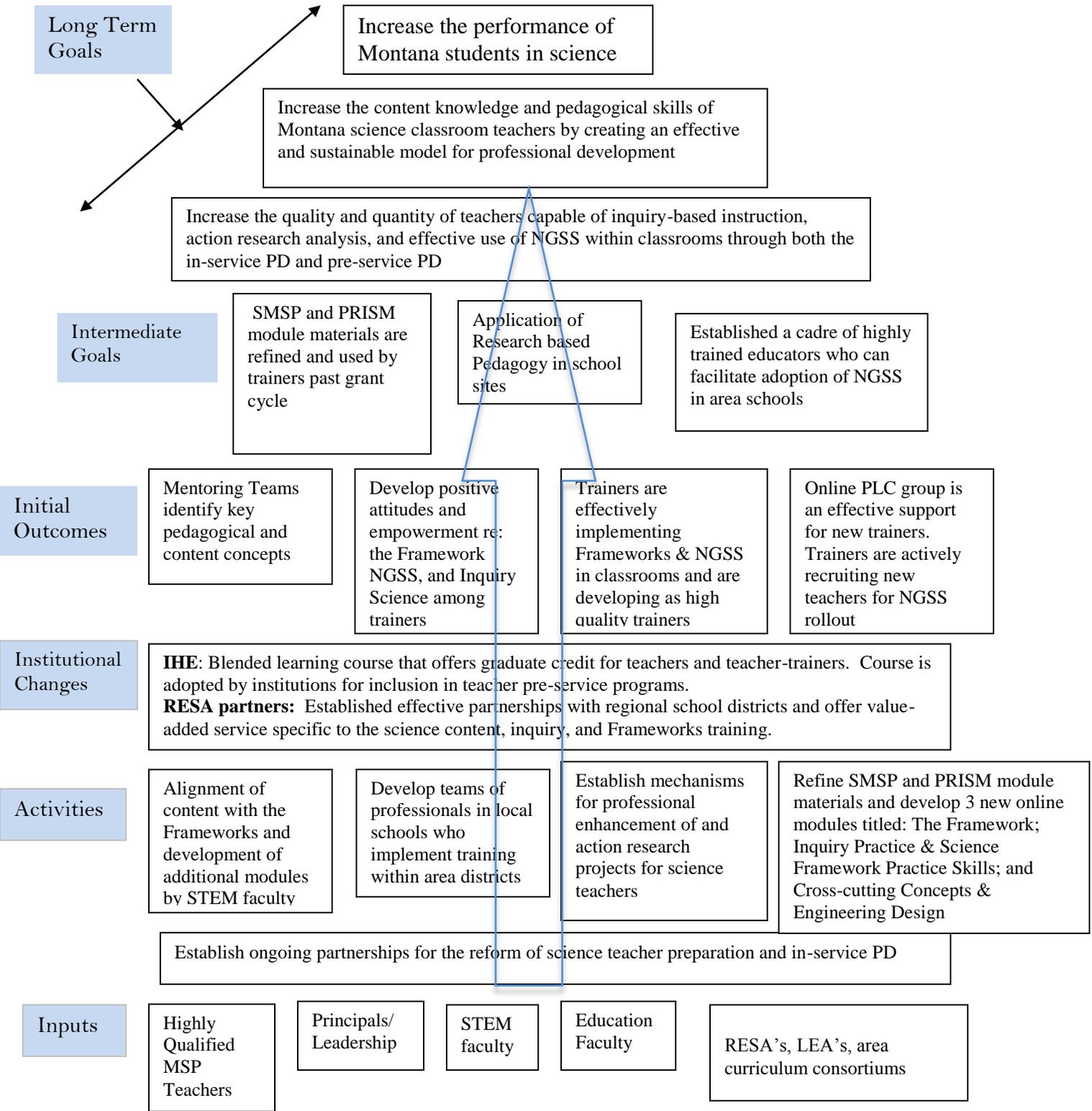
Adapted from Guskey, Thomas R. *Evaluating Professional Development* Thousand Oaks, CA: Corwin Press, Inc

f. Dissemination Plan

The project evaluation team will disseminate formative findings at annual meetings and monthly through the Project Leadership Team meetings. Yearly summative findings will be presented at the Core Planning Team meetings and will be reported in the annual MSP report documents. The project leadership team will provide a synopsis of findings to each Core Planning Team member.

The project leaders will present annually at the MT STEM initiative meetings, MCEL, and MEA-MFT in an effort to reach a wide audience about the project's findings. In addition, the project leaders will request to present at the national MSP conference. The project leaders will publish articles related to the research findings in **Year 3** of the project. The dissemination plan events are outlined on project timeline found on page 20.

MPRES Logic Model



Section 5: Partnership Budget and Budget Narrative

The total cost of the project over three years is **\$1,005,534**, allowing for **\$335,178** per year. The project's budget is responsive to the goals and objectives of MT MSP program and the specific project goals. Montana Tech will be the fiscal agent for the project and will issue subcontracts to each of the partners named in the grant. Montana Tech offers institutional support for the grant by allowing STEM faculty to participate in grant activities during the academic year, supporting Cfwep.Org staff salary through other program budgets, and institutional support to Cfwep.Org for budget management. Approximately 34% of the grant funds will be directed to the regional service areas. This calculation considers the payments to teachers and trainers for stipend and travel, payments to area principals for participation in leadership meetings, payments for RESA leaders for travel and Core Planning Team participation, and subcontract payments to RESA's for coordination and recruitment efforts. Montana Tech and MSU-Billings will coordinate the teacher stipend and travel payments, allowing for a seamless system for payment to trainers and teachers. Teacher stipends and travel are reflected in the Montana Tech and MSU-Billings budget line items.

Montana Tech Budget Narrative

1) Salaries and Wages: The model proposed by the MPRES project leaders includes a co-PI model between Dr. Ken Miller and Rayelynn Connole. This co-PI model allows for effective coverage of the regional service areas and development of key partnerships within and near each area. In **Year 1**, Montana Tech is allocated a total of **\$55,500** for salaries and wages. This figure includes salary for co-PI Rayelynn Connole at **\$10,000**, salary for a 0.5 FTE project coordinator at **\$23,000**, an administrative assistant at 0.25 FTE for **\$7,500** and 60 STEM faculty days at \$250/day for a total of **\$15,000**. These salary amounts are reflective of the amount of preparation and work required to complete the project goals in **Year 1**, including development of three new modules for the project, recruitment and selection of trainers, and building of professional networks and collaborations across the regions.

In **Year 2 and Year 3**, salary allocation to Montana Tech decreases, with STEM faculty days, project coordinator time, and PI allocation reductions. **Year 2** salary for Montana Tech is **\$40,500** and **Year 3** salary allocation is **\$38,000**. This reduction reflects the project goal that area providers will become less and less dependent on the project leaders for assistance and facilitation of the training. The project **total allocation in salary** for Montana Tech is **\$134,000**.

2) Fringe Benefits: Fringe benefits for Montana Tech faculty and staff members include health insurance and retirement benefits and are calculated on percentage of salary. For professional staff, the allocation is 46%, for faculty 25%, and classified staff rate is 57%. Fringe benefits are **\$23,205** in **Year 1**, **\$18,405** in year two, and **\$17,780** in **Year 3**. The project **total allocated to fringe benefits** for Montana Tech is **\$59,390**.

3) Travel In-State: Travel in-state includes allocation for trainer travel to workshops, overnight accommodations for trainers, travel and accommodations for project leaders for CPT meetings, workshops, and state meetings, and travel for Core Planning Team (CPT) members. Travel allocation for CPT members is allocated at **\$10,000 total** for the three years in order to ensure that CPT members are able to attend two CPT meetings and one leadership meeting per year.

Travel reimbursement for trainers is allocated at **\$10,437** for the three years and is expected to cover partial reimbursement for travel. Workshops are expected to be hosted at MSU-Bozeman, which is approximately equidistant between the regions. Trainers will receive stipends in addition to their travel allowance, which will allow for coverage of any additional travel costs.

Travel for the MT Tech project leaders to CPT meetings, workshops, and state meetings is allocated at **\$1,520** which will cover approximately half of the program's expenses for travel in-state. The Cfwep.Org program team will re-invest project indirect funds and coordinate other Cfwep.Org activities with MPRES activities in order to defray travel costs. Total in-state travel costs for MT Tech are **21,957**.

4) Travel out of State: Travel for the annual MSP conference is budgeted at **\$5,000** in years one and two, and **\$4,000** in **Year 3**. In years two and three, a trainer will accompany the PI's from MSU-Billings and Montana Tech to the annual conference. **\$3,000** per year is budgeted for the evaluators' travel to Montana.

5) Materials and Supplies: A very limited materials and supplies budget is afforded throughout the project. This line item will cover any needed items for workshops and CPT meetings. The three year allocation is **\$800**.

6) Consultants and Contracts: In **Year 1**, **\$2,400** is allocated for substitute teacher costs in order to allow early release for the trainers, factored at \$100/day for four days. After **Year 1**, it is expected that trainers will not require release time as workshops will be held on weekends and during the month of June. As the fiscal agent, Montana Tech will issue subcontracts to Montana State University-Billings, Montana State University-Bozeman, Education Northwest, RESA4U, MRESAIII, WM-CSPD, and MNCESR. These subcontracts are itemized by partner in the budget narrative and are reflected on their individual budget pages.

7) Teacher Stipends: Trainer stipends, teacher stipends, and principal stipends will be paid through Montana Tech and MSU-Billings in order to ensure timely delivery of payments and follow-through of project expectations prior to payment. The stipends are split allocation between Montana Tech and MSU-Billings.

Trainers will receive a total of **\$13,000** over the three years. Trainers are expected to complete the graduate course requirements in **Year 1**, host four workshops with support and conduct monthly PLC meetings in **Year 2**, and host four workshops, provide online support, and conduct monthly PLC meetings in **Year 3**. The total allocation for the trainer stipends paid through Montana Tech is **\$82,000**, with the project total allocated to trainer stipends at **\$164,000**.

Teachers who are recruited by the new trainers and project leaders will receive **\$750 per year plus \$250** in assessment bonuses for completing the online course and workshops. The assessment bonuses ensure that teachers will complete the mandatory assessments for the project evaluation. The total three-year allocation to

teacher stipends is **\$65,000** for Montana Tech. The project total between Tech and MSU-Billings for teacher stipends is **\$131,000**.

Principals will be offered a stipend of \$150/day to attend yearly leadership meetings, for a three-year total of **\$5,400** allocated to Montana Tech and a project total of **\$10,800**. Principals will be asked to attend two workshops during the grant cycle. The Principals' workshops are designed to enlist principals in the project vision, train principals how to utilize the online resources, and assist individual schools with the set up of professional learning communities.

8) Equipment Purchase: No equipment purchases are budgeted for this project. Montana Tech will provide technical equipment for workshops and will offer equipment for loan to trainers.

9) Other: Postage, telephone, and website fee costs have been allocated for a total of **\$2,209**. Rent and utilities are provided in-kind from Montana Tech.

Budget Narrative MSU-Billings

1) Salary and Wages: The model proposed by the MPRES project leaders includes a co-PI model between Dr. Ken Miller and Rayelynn Connole. This co-PI model allows for effective coverage of the regional service areas and development of key partnerships within and near each area. In **Year 1**, MSU-Billings is allocated a total of **\$35,500** for salaries and wages. This figure includes salary for co-PI Ken Miller at **\$10,000**, salary for a 0.75 FTE project coordinator at **\$22,500**, and an administrative assistant at 0.10 FTE for **\$3,000**. These salary amounts are reflective of the amount of preparation and work required to complete the project goals in **Year 1**, including development of three new modules for the project, recruitment and selection of trainers, and building of professional networks and collaborations across the regions. In **Year 2** and **Year 3**, salary allocation to MSU-B decreases, with project coordinator time, and PI allocation reductions. **Year 2** salary allocation is **\$33,500** and **Year 3** allocation is **\$26,000**. The three-year project salary total allocation to MSU-B is **\$95,000**.

2) Fringe Benefits: Fringe benefits for MSU-Billings staff are calculated at 18.80% plus 733/month FTE for health insurance. For faculty members, the rate is 19.23%. Fringe benefits are **\$14,194 in Year 1**, **\$13,809 in Year 2**, and **\$10,200 in Year 3**. Total allocation for fringe benefits is **\$38,203**.

3) Travel In-State: Travel in-state includes allocation for trainer travel to workshops, overnight accommodations for trainers, travel and accommodations for project leaders for CPT meetings, workshops, and state meetings, and travel for Core Planning Team (CPT) members. Travel allocation for CPT members is allocated at **\$10,000 total** for the three years in order to ensure that CPT members are able to attend two CPT meetings and one leadership meeting per year.

Travel reimbursement for trainers is allocated at **\$10,480** for the three years and is expected to cover partial reimbursement for travel. Workshops are expected to be hosted at MSU-Bozeman, which is approximately equidistant between the regions. Trainers will receive stipends in addition to their travel allowance, which will allow for coverage of any additional travel costs.

Project leader travel to CPT meetings, workshops, and state meetings is allocated at **\$8,118**.

4) Travel Out of State: Travel for the annual MSP conference is budgeted at **\$5,000 annually**. In **Year 2 and 3**, a trainer will accompany the PI's from MSU-Billings and Montana Tech to the annual conference.

5) Materials and Supplies: A very limited materials and supplies budget is afforded throughout the project. This line item will cover any needed items for workshops and CPT meetings. The three year allocation is **\$1,104**.

6) Consultants and Contracts: In **Year 1**, **\$2,400** is allocated for substitute teacher costs in order to allow early release for the trainers, factored at \$100/day for four days. After **Year 1**, it is expected that trainers will not require release time as workshops will be held on weekends and during the month of June. Allocation of **\$2,000** per year is planned for SCOOP protocol evaluations.

7) Teacher Stipends: Trainer stipends, teacher stipends, and principal stipends will be paid through Montana Tech and MSU-Billings in order to ensure timely delivery of payments and follow-through of project expectations prior to payment. The stipends are split allocation between Montana Tech and MSU-Billings.

Trainers will receive a total of **\$13,000** over the three years. Trainers are expected to complete the graduate course requirements in **Year 1**, host four workshops with support and conduct monthly PLC meetings in **Year 2**, and host four workshops, provide online support, and conduct monthly PLC meetings in **Year 3**. The total allocation for the trainer stipends paid through MSU-Billings is **\$82,000**, with the project total allocated to trainer stipends at **\$164,000**.

Teachers who are recruited by the new trainers and project leaders will receive **\$750 per year plus \$250** in assessment bonuses for completing the online course and workshops. The assessment bonuses ensure that teachers will complete the mandatory assessments for the project evaluation. The total three-year allocation to teacher stipends is **\$66,000** for MSU-Billings. The project total between Tech and MSU-B for teacher stipends is **\$131,000**.

Principals will be offered a stipend of \$150/day to attend yearly leadership meetings, for a three-year total of **\$5,400** allocated to MSU-Billings and a project total of **\$10,800**. Principals will be asked to attend two workshops during the grant cycle. The Principals' workshops are designed to enlist principals in the project vision, train principals how to utilize the online resources, and assist individual schools with the establishment of professional learning communities.

8) Equipment Purchase: No equipment purchases are budgeted for this project. Montana Tech will provide technical equipment for workshops and will offer equipment for loan to trainers.

9) Other: Postage, telephone, and website fee costs have been allocated for a total of **\$2,100**. Rent and utilities are provided in-kind from MSU-Billings.

Budget Narrative MSU-Bozeman

1) **Salary and Wages:** Salary is allocated for a total of **\$8,100** per year for MSU education faculty for Dr. John Graves, who will be the lead for the MSU-Bozeman project. He will provide expertise for creation of online coursework, workshop planning, inquiry methods and materials, and will host the online graduate course through the MSSE program at MSU. Dr. Art Bangert will receive a **\$4,000** stipend for assisting with the evaluation oversight committee and online evaluation pieces.

2) **Benefits:** Benefits are calculated at 19% for MSU and are included for Dr. Graves at **\$1,900** per year.

3) **Travel in state:** Travel in state for MSU faculty members is calculated using the fleet rate of \$0.66 per mile. Travel in state includes travel to CPT meetings and workshops. A three-year total of **\$1,000** is allocated for travel.

4) **Travel out of state:** none

5) **Materials and Supplies:** none

6) **Consultants and Contracts:** The Burns Technology Center at MSU will receive **\$1,000** per year for hosting the online course shell. Course registration will be handled through the BTC.

Budget Narrative RESA partners

The RESA partners will be paid a flat fee per year for participating in the project. In addition, travel allowance for RESA leaders is afforded for the Core Planning Team (CPT) meetings. In **Year 1**, RESA4U and MRESA III will each receive **\$7,500** and WM-CSPD, MNCESR, and PESA will each receive **\$5,000**. The RESA partners are expected to participate in CPT meetings, provide feedback and support to the project directors regarding the evolution of the project, recruit teachers, and develop strong relationships with area school leaders. In **Year 1**, RESA4U and MRESA III partners have agreed to assisting the project partners with needs assessments for these areas in order to better inform the project partners regarding teacher and school district-specific needs. Their fee also includes time for consulting with the project partners regarding the

development of graduate course and training materials. In **Year 2** and **Year 3**, each RESA partner will receive **\$5,000**.

Budget Narrative LEA partners

LEA leadership members will be paid for attendance at CPT meetings. In addition, school district principals who have teachers involved in the project will be paid a stipend of **\$150** per day for attendance at leadership training and dissemination events.

Budget Narrative Education Northwest

Education Northwest is requesting approximately 10% of the grant total for consulting services connected to the project evaluation. The 10% rate is reflective of allowed amounts as outlined by the Office of Public Instruction. The evaluation costs are factored at **\$30,000** per year, for a three-year total of **\$90,000**. Education Northwest will provide a comprehensive evaluation for the project. (Please see narrative for specific tools utilized). Dr. Phyllis Ault will chair the Evaluation Oversight Committee and will work with various partners to complete the needs analysis, analysis of SCOOP notebooks, and analysis of survey materials.

Out of state travel of **\$3,000** per year has been allocated in order for Dr. Michael Coe and Dr. Phyllis Ault to travel to Montana for initial assessments and meetings.

Section 6: Proposal Appendices

Appendix A: Cover Page

Appendix B: Statement of Assurances

Appendix C: Partnership Identification Forms

Appendix D: Budget Forms

Appendix E: Letters of Commitment from Each Partner

Appendix F: Partner Funding Request for Each Partner

Appendix A: Cover Page

MONTANA MATHEMATICS AND SCIENCE PARTNERSHIP (MSP) PROGRAM APPLICATION

Applying Institution or Organization: MONTANA TECH OF THE UNIVERSITY OF MONTANA (fiscal agent)

Program Title: Montana Partnership with Regions for Excellence in STEM (MPRES)

Program Director(s)

Name: Rayelynn Connole
Title: Cfwep.Org Curriculum Coordinator
Address: Institute for Educational Opportunities, Montana Tech
1300 W Park St
Zip Code: 59701
Telephone: Fax: (406)496-4898 fax (406)496-4696
E-Mail: rconnole@mtech.edu

Program Director(s)

Name: Dr. Ken Miller
Title: Director of Educational Programs, College of Education
Address: Room 262
Montana State University Billings
Billings, MT
Zip Code: 59101
Telephone: Fax: (406)657- 2034
E-Mail: kmiller@msubillings.edu

Amount of MSP Funds Requested: \$ 1,005,534

Number of Teachers to Be Served Directly: 152

Certification by Authorized or Institutional Official:

The applicant certifies that to the best of his/her knowledge the information in this application is correct, that the filing of this application is duly authorized by the governing body of this organization, or institution, and that the applicant will comply with the attached statement of assurances.

**Authorized Official Grants
Officer or Superintendent of Fiscal Agent**

Title

Signature of Authorized Official

Date

Appendix B: Statement of Assurances

This form is on file from Montana Tech from the previous MSP project. Please contact PI Connole if additional documentation is needed.

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Montana Tech of the University of Montana
(Cfwep.Org)

Contact Name/Title: Dr. Douglas M. Abbott
Vice Chancellor of Academic Affairs and Research

Contact Mailing Address: Montana Tech
1300 West Park St
Butte, MT 59701

Telephone: (406)496-4127
Fax: (406)496-4387
E-Mail: dabbott@mtech.edu

Type of Institution/Organization: STEM College of Institute of Higher Education.

Partner School District Demographics (If Applicable):

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: College of Letters and Science
Montana Tech of the University of Montana

Contact Name/Title: Dr. Doug Coe, Dean

Contact Mailing Address: Montana Tech
1300 West Park St
Butte , MT 59701

Telephone: (406)496-4207
Fax: (406)496-4260
E-Mail: dcoe@mtech.edu

Type of Institution/Organization: STEM College of Institute of Higher Education.

Partner School District Demographics (If Applicable):

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Montana State University-Billings

Contact Name/Title: Dr. Kenneth Miller, Director of Educational Programs, Co-PI
for project

Contact Mailing Address: MSU Billings
1500 University Drive
Billings, MT 59101

Telephone: (406) 657-2034
Fax: (406)
E-Mail: kmiller@msubillings.edu

Type of Institution/Organization: Education Department, Institute of Higher Education.

Partner School District Demographics (If Applicable):

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Department of Education, Montana State University

Contact Name/Title: Dr. Art Bangert

Contact Mailing Address: 115 Reid Hall
Montana State University
Bozeman, MT 59717

Telephone: (406) 994-7424

Fax: (406) 994-3261

E-Mail: abangert@montana.edu

Type of Institution/Organization: Education Department, Institute of Higher Education.

Partner School District Demographics (If Applicable):

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Montana Educational Consortium

Contact Name/Title: Fred B. Seidensticker, Director

Contact Mailing Address: PO Box 288
 Twin Bridges, MT 59754

Telephone: (406) 684-5523

Fax: (406) 864-5523

E-Mail: fred@gccmt.org

Type of Institution/Organization: Curriculum Consortium of K-8 and K-12 small districts.

Partner School District Demographics (If Applicable):

Included in the consortium are 9 K-12 districts (7 Class C; 2 Class B) and 1 K-8 district

Total K-6 enrollment in consortium = 1285

Montana Public School Free and Reduced Price Participation Data			
Target Area Schools	Total Participation Percent	Free and Reduced Participation Count	Enrollment Eligible Count
Ennis	23.14%	47	181
Gallatin Gateway	30.63%	40	129
Lima	66.32%	30	42
Phillipsburg	43.75%	31	89
Shields Valley	28.8%	36	125
Sheridan	31.25%	38	108
Three Forks	28.76%	78	271
Twin Bridges	34.1%	35	111
Whitehall	38.01%	68	210

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Alliance for Curriculum Enhancement (ACE)

Contact Name/Title: Andrea Fischer, Director

Contact Mailing Address: 410 Colorado Ave
Laurel, MT 59044

Telephone: (406) 690-9872

Fax:

E-Mail: afischer.acemt@gmail.com

Type of Institution/Organization: Curriculum Consortium

Partner School District Demographics (If Applicable):

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Billings Public Schools

Contact Name/Title: Kim Anthony, Executive Director of Curriculum

Contact Mailing Address: 415 N. 30th
Billings, MT 59101

Telephone: (406) 281-5069

Fax: (406) 281-6187

E-Mail: anthonyk@billingsschools.org

Type of Institution/Organization: High Needs LEA

Partner School District Demographics (If Applicable):

10/11 SY: 28.20% free; 7.70% for reduced H.S.
44.70% free and reduced for Elementary

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Butte School District #1

Contact Name/Title: Judy Jonart, Superintendent

Contact Mailing Address: 111 N. Montana St.
Butte, MT 59701

Telephone: (406) 533-2527

Fax: (406) 533-2526

E-Mail: jonartjm@butte.k12.mt.us

Type of Institution/Organization: High Needs LEA

Partner School District Demographics (If Applicable):

10/11 SY: 46.18% elementary students eligible for free and reduced meals
33.77% high school students eligible for free and reduced meals

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Regional Education Service Area 4 You (RESA 4U)

Contact Name/Title: Bruce Grubbs, Director

Contact Mailing Address: PO Box 6669
Bozeman, MT 59771-6669

Telephone: 406-570-7467

Fax:

E-Mail: bruce.g.resa4u@gmail.com.

Type of Institution/Organization: Regional Service Area

Partner School District Demographics

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Montana Regional Education Service Area III

Contact Name/Title: Marsha Sampson, Director

Contact Mailing Address: MSU Billings

1500 University Drive

Billings, MT 59101

Telephone: 406-657-2085

Fax: 406-657-2313

E-Mail: msampson@msubillings.edu

Type of Institution/Organization: Regional Service Area

Partner School District Demographics

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Western Montana Comprehensive System of Professional Development (WM-CSPD)

Contact Name/Title: Nancy Marks, Director

Contact Mailing Address: 215 S. 6th Street West
Missoula, MT 59801

Telephone: (406) 728-2400 x1088

Fax: (406) 728-2417

E-Mail: nancymarks@wmcspd.org

Type of Institution/Organization: Regional Service Area

Partner School District Demographics

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Montana North Central Educational Services Region (MNCESR)

Contact Name/Title: Gayle Genereux, Director

Contact Mailing Address: 17555 Coal Mine Rd
Big Sandy, MT 59520-8283

Telephone: (406) 378-3136

Fax: 406-378-3139

E-Mail: gayegenereux@yahoo.com

Type of Institution/Organization: Regional Service Area

Partner School District Demographics

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Prairie Education Service Area (PESA)

Contact Name/Title: Kim Stanton, Director

Contact Mailing Address: 707 South Stacy
Miles City, MT 59301

Telephone: (406) 853-1908

Fax:

E-Mail: pesa@midrivers.com

Type of Institution/Organization: Regional Service Area

Partner School District Demographics

PARTNERSHIP IDENTIFICATION FORM

PARTNER INSTITUTION: Education Northwest

Contact Name/Title: Dr. Phyllis Ault, Senior Research Associate

Contact Mailing Address: 101 SW Main Suite 500
Portland, OR 97201-3213

Telephone: (503) 275-9638

Fax:

E-Mail: phyllis.ault@educationnorthwest.org

Type of Institution/Organization: External Evaluator

Partner School District Demographics

Appendix D: Budget Forms

Budget Partnership Funding Request

Program Title: MT Partnership with Regions for Excellence in STEM (MPRES)

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested	2012-13	2013-14	2014-15	
1 Salary & Wages	99,100	82,100	72,100	253,300
2. Employee Benefits	39,299	34,114	29,880	103,293
3. Travel in-state	24,637	15,400	11,518	51,555
4. Travel out-of-state	13,000	13,000	12,000	38,000
5. Materials & Supplies	1,725	179	0	1,904
6. Consultants & Contracts	71,800	62,000	62,000	195,800
7. Teacher & Principal Stipends	63,600	110,600	131,600	305,800
8. Equipment (Purchase)	-	-	-	-
9. Other (Postage, etc)	1,900	1,150	1,000	4,050
Total Direct	315,061	318,543	320,098	953,702
Indirect Cost (5% of Direct costs excluding stipends and equipment)	20,117	16,635	15,080	51,832
Total Funding to Partnership from Grant	335,178	335,178	335,178	1,005,534

*The indirect cost rate shall not exceed the indirect cost rate for the partner with the lowest indirect cost rate.

This form is a required element of the grant application. Justification for each of the categories shall be included in the budget narrative portion of the application. Modifications to the grant must be reflected over the two years of the grant and included as part of the annual reporting. Annual reapplication is required for continuation of funding for all grants. For reporting, you must include an itemized breakdown of these budget categories and a budget narrative explaining how you calculated each line item and the actual total project cost share.

Budget Partner Funding Request

Name of Partner Organization: Montana Tech

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	2012-13	2013-14	2014-15	
1 Salary & Wages	55,500	40,500	38,000	134,000
2. Employee Benefits	23,205	18,405	17,780	59,390
3. Travel in-state *	10,717	6,620	4,620	21,957
4. Travel out-of-state**	8,000	8,000	7,000	23,000
5. Materials & Supplies	800	0	0	800
6. Consultants & Contracts***	62,400	55,000	55,000	172,400
7. Teacher Stipends	31,800	54,800	65,800	152,400
8. Equipment (Purchase)	-	-	-	-
9. Other (Postage, etc)	950	500	500	1,950
Total Direct	193,372	183,825	188,700	565,897
Indirect Cost 8% of total direct excluding stipends and equipment Indirect for contracted services from partners included in Tech rate	12,926	10,322	9,832	33,080
Total Funding to Partner from Grant	206,298	194,147	198,532	598,977

*Travel in-state for the MT Tech budget includes travel for teachers, trainers and CPT members

**Includes travel for evaluator to MT

***Includes the subcontracts for substitute fees, the five RESA's, and EDNW.

MSU and MSU-B are reflected on separate partner funding sheets.

Budget Partner Funding Request

Name of Partner Organization: Montana State University-Billings

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	2012-13	2013-14	2014-15	
1 Salary & Wages	35,500	33,500	26,000	95,000
2. Employee Benefits (30%)	14,194	13,809	10,200	38,203
3. Travel in-state*	13,420	8,530	6,648	28,598
4. Travel out-of-state	5,000	5,000	5,000	15,000
5. Materials & Supplies	925	179	0	1,104
6. Consultants & Contracts (SCOOP & Subs)	4,400	2,000	2,000	8,400
7. Teacher Stipends	31,800	55,800	65,800	153,400
8. Equipment (Purchase)	-	-	-	-
9. Other	950	650	500	2,100
Total Direct	106,189	119,468	116,148	341,805
Indirect Cost (5% of direct excluding stipends and equipment)	5,951	5,093	4,028	15,072
Total Funding to Partner from Grant	112,140	124,561	120,176	356,877

*Travel in-state includes travel for teachers and trainers to attend workshops

Budget Partner Funding Request

Name of Partner Organization: Montana State University-Bozeman

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	2012-13	2013-14	2014-15	
1 Salary & Wages	8,100	8,100	8,100	24,300
2. Employee Benefits	1,900	1,900	1,900	5,700
3. Travel in-state	500	250	250	1,000
4. Travel out-of-state	-	-	-	
5. Materials & Supplies	-	-	-	
6. Consultants & Contracts (Bangert &BTC)*	5,000	5,000	5,000	15,000
7. Teacher Stipends	-	-	-	
8. Equipment (Purchase)	-	-	-	
9. Other (Printing)	-	-	-	
Total Direct	15,500	15,250	15,250	46,000
Indirect Cost	1,240	1,220	1,220	3,680
Total Funding to Partner from Grant	16,740	16,470	16,470	49,680

*Dr. Art Bangert will be part of the evaluation advisory board and will receive a stipend rather than salary and benefits. Burns Technology Center is also listed in Consultants and Contracts

**Budget
Partner Funding Request**

Name of Partner Organizations: MEC, ACE, Billings Public Schools, and Butte School District #1

LEA's are factored into the program budget line items for MT Tech and MSU-B and include travel to CPT meetings, stipends for principals, trainers, and teachers.

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	-	-	-	
1 Salary & Wages	-	-	-	
2. Employee Benefits	-	-	-	
3. Travel in-state		-	-	
4. Travel out-of-state	-	-	-	
5. Materials & Supplies	-	-	-	
6. Consultants & Contracts				
7. Teacher Stipends				
8. Equipment (Purchase)				
9. Other (Printing)				
Total Direct				
Indirect Cost				
Total Funding to Partner from Grant				

Travel costs, teacher, trainer, and principal stipends are included in the budget forms for MSU-B and Montana Tech.

CPT members will receive travel allowance for attending meetings. This amount is reflected on the MSU-B and Mt Tech forms.

**Budget
Partner Funding Request**

Name of Partner Organization: EDNW

NWREL is included in consultants and contracts for overall budget.

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	2012-13	2013-14	2014-15	
1 Salary & Wages				
2. Employee Benefits				
3. Travel in-state				
4. Travel out-of-state*				
5. Materials & Supplies				
6. Consultants & Contracts (Evaluation)	30,000	30,000	30,000	90,000
7. Teacher Stipends				
8. Equipment (Purchase)				
9. Other (Printing)				
Total Direct				
Indirect Cost				
Total Funding to Partner from Grant	30,000	30,000	30,00	90,000

*Travel for the evaluators to MT is reflected on the MT Tech budget sheets and also reflected here.

**Budget
Partner Funding Request**

Name of Partner Organization: RESA 4U

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	2012-13	2013-14	2014-15	
1 Salary & Wages				
2. Employee Benefits				
3. Travel in-state				
4. Travel out-of-state				
5. Materials & Supplies				
6. Consultants & Contracts	7,500	5,000	5,000	17,500
7. Teacher Stipends				
8. Equipment (Purchase)				
9. Other (Printing)				
Total Direct				
Indirect Cost				
Total Funding to Partner from Grant	7,500	5,000	5,000	17,500

**Budget
Partner Funding Request**

Name of Partner Organization: MRESA III

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	2012-13	2013-14	2014-15	
1 Salary & Wages				
2. Employee Benefits				
3. Travel in-state				
4. Travel out-of-state				
5. Materials & Supplies				
6. Consultants & Contracts	7,500	5,000	5,000	17,500
7. Teacher Stipends				
8. Equipment (Purchase)				
9. Other (Printing)				
Total Direct				
Indirect Cost				
Total Funding to Partner from Grant	7,500	5,000	5,000	17,500

**Budget
Partner Funding Request**

Name of Partner Organization: WM-CSPD, MNCESR, and PESA

Travel costs for RESA directors/leaders to attend CPT meetings are factored in the in-state travel line items for MSU-B and Montana Tech. This budget sheet is reflective of flat fee payment for consulting.

	YR 1	YR 2	YR 3	TOTAL
Direct Cost Requested for Partner	2012-13	2013-14	2014-15	
1 Salary & Wages				
2. Employee Benefits				
3. Travel in-state				
4. Travel out-of-state				
5. Materials & Supplies				
6. Consultants & Contracts	5,000	5,000	5,000	15,000
7. Teacher Stipends				
8. Equipment (Purchase)				
9. Other (Printing)				
Total Direct				
Indirect Cost				
Total Funding to Partner from Grant	5,000	5,000	5,000	15,000

Appendix E: Letters of Commitment from Each Partner

Letters of commitment from each partner are included as attachments with this grant application. Please contact PI Connole if additional documentation is needed.

Appendix F: References Cited

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