The Maine Physical Sciences Partnership (MainePSP) is a collaboration between rural Maine school districts, the University of Maine, the Maine Center for Research in STEM Education, several non-profit organizations with science education expertise, and the Maine Department of Education. We are supported by a $12 million grant from the National Science Foundation to build a sustainable infrastructure that strengthens rural science education. Our vision is to create a sustainable partnership that improves STEM (science, technology, engineering and math) teacher recruitment, retention and preparation; strengthens the teaching and learning of physical science in the critical grade range of 6th-9th with a challenging, vertically aligned curriculum that encourages students to study more science; improves teacher knowledge of science and scientific inquiry; and supports research that will inform future rural educational initiatives. To realize this vision, the project includes:

- The selection and implementation of research-based instructional materials that are aligned with state and national standards.
- Ongoing professional development and support for teachers before and during implementation.
- Investment in an array of support mechanisms for schools and teachers as instructional materials are implemented.
- Research into the improvement of rural science education at these grade levels, including the study of student learning and student aspirations, as well as research into how teachers develop new understanding of science and the teaching of science and how teachers make changes in classroom practices.
- Vertical teaming and collaborations among all partners to achieve the project’s common, multi-institutional goals.

More information about the MainePSP can be found at umaine.edu/MainePSP

A productive partnership requires active participation from all stakeholders, including teachers, school administrators, and district personnel, as well as university faculty, staff and students, and institutional partners. This Memorandum of Understanding is intended to describe what teachers, principals, curriculum coordinators and superintendents can expect from the MainePSP and what commitments these parties are expected to make when participating in the partnership. The first section describes the responsibilities of the MainePSP, the second section describes the responsibilities of the teacher, and the third section describes responsibilities that are shared by the teacher, building principal, curriculum coordinator and superintendent. A copy of this document will be completed for each teacher that is selected to join the MainePSP for the 2014-2015 school year. For more information, please contact Erika Allison at erika.allison@maine.edu or (207) 581-4674.
The Maine Physical Science Partnership agrees to provide:

Research-supported curriculum: During the first two years of the grant, Curriculum Evaluation Task Forces completed an extensive review process of available instructional materials for grades 6-9 physical sciences and selected three programs: Science Education for Public Understanding (SEPUP) Issues and Earth Science for the study of middle school earth science, Project Based Inquiry Science (PBIS) for the study of force & motion, energy and chemistry, and Earth Systems Science in the Community (EarthComm) for the study of high school physical sciences concepts in an earth science and global climate change context. The instruction supported by these materials will prepare students with scientific skills and knowledge needed for the current and future workforce by engaging them in hands-on science courses. In these courses, students design and conduct experiments, invent solutions to authentic challenges, and learn the way scientists and engineers learn.

Professional development & community: The MainePSP supports teachers with quality professional development opportunities both before and during implementation. The Summer Academy introduces new implementing teachers to the instructional resources and provides additional assistance to continuing teachers. Periodic SEPUP, PBIS and EarthComm Cohort Meetings are held during the academic year to provide continued support. Collaboratives held throughout the school year serve as opportunities for teachers and university personnel to discuss the teaching and learning of science. Over the course of a two-year participation cycle, teachers receive over 100 paid hours of science teacher professional development.

Instructional resources: Each implementing teacher will be provided with: a classroom set of print textbooks, access to the online textbook for all students, a print teacher’s edition, electronic teacher resources, and extensive hands-on instructional materials to accompany each unit, with a total value of approximately $7000 per teacher.

Support mechanisms: Resource Coordinators support teachers with their expertise on the instructional resources. The MainePSP also hosts an online community at mainepsp.org, through which teachers, teaching partners, and university faculty and staff can communicate and collaborate.

Research findings: The MainePSP is conducting research on teaching and learning that can be used to improve science education in Maine and beyond. The results of this research will also inform the practices of the MainePSP.

Programs designed to improve teacher recruitment, retention and preparation: The MainePSP sponsors efforts to improve university-level science courses for pre-service teachers and others. Targeted course reform and recruitment programs encourage a strong, diverse group of undergraduates to pursue teaching careers by providing early involvement in teaching and professional development.
The teacher agrees to:

**Attendance at Summer Academy:** Implementing teachers are expected to attend the MainePSP Summer Academy from June 24-28, 2014 at Schoodic Education and Research Center (SERC). This gathering is an opportunity for whole community building and content-based professional development for all implementing teachers, both new and continuing. Room and board is provided, along with a $1000 stipend for each Academy.

**Attendance at Curriculum Orientation (if applicable):** New-to-MainePSP teachers, or those who are teaching a new MainePSP program for the first time are expected to attend Curriculum Orientation from August 18-19, 2014 at the University of Maine. This orientation is an opportunity for new teachers to receive program-specific curriculum-based professional development and learn how to access important resources and materials related to what they will be teaching. A stipend of $25 per hour and meals are provided for the two-day training.

**Attendance at community meetings:** Implementing teachers are expected to attend all community meetings for their program/cohort, approximately one meeting per month. A stipend of $25 per hour and meals are provided for cohort meetings. Lack of attendance or participation in community meetings may result in suspended access to classroom resources.

**Participation in online community:** The MainePSP Community site (mainepsp.org) is designed to facilitate the sharing of ideas and experiences among implementing teachers. Implementing teachers are expected to share resources and reflections on classroom practice. Implementing teachers are also expected to read other teachers’ entries and to engage in online conversations. Teachers will be compensated for active involvement in the online community.

**Support for research initiatives:** Implementing teachers are expected to participate in research efforts related to this project. This could include completing surveys, submitting evaluation data, and collecting and submitting student work samples in a timely manner. Optional participation in interviews and classroom observations is also encouraged but not required.

**Responsibility for materials:** Implementing teachers agree to take good care of the classroom materials and books that are on loan from the MainePSP. Teachers agree to comply with inventory procedures upon delivery and before pick-up of materials.
The teacher, principal, curriculum coordinator and superintendent agree to:

Fidelity of implementation: The MainePSP relies upon the professionalism and expertise of classroom science teachers as they help meet the goal of the MainePSP: to create a common learning environment that is shared across districts with the long-term goal of improving education in Maine. A task force comprised of public school teachers, district personnel, and university faculty and graduate students selected the units from SEPUP, PBIS and EarthComm through an extensive review process. The online syllabi for SEPUP, PBIS and EarthComm are living documents that outline the scope and sequence of the programs and are revised collaboratively by implementing teachers and program staff based on insights gathered through practice, assessment, and discussions within the MainePSP. Implementing teachers are expected to implement the selected units in their entirety and in sequence. Implementing teachers will document any modifications made to address the needs of their students and any assessments used to measure student learning, and agrees to share these ideas with the community.

Material Support: Participating schools are required to provide implementing teachers with a toolkit of basic materials that can serve their entire course load of students. See Appendix A for required materials in the toolkit.

Ownership of Materials: Materials provided by the MainePSP include hands-on science materials and textbooks, as described on page 2. All physical and digital materials are the property of the MainePSP and will be returned to the MainePSP should a participating teacher leave the program.

Participation in Evaluation and Research Activities: The MainePSP is responsible to the National Science Foundation (NSF) for evaluating the effectiveness of this program. In addition, research studies are being conducted to better understand the process of science education reform. Implementing teachers and schools are expected to participate in both evaluation and research activities. Additional information about required and optional evaluation and research activities is provided in Appendix B, including the assent and consent forms for students, parents, and teachers.

Sustainability: The Maine Physical Science Partnership is currently funded by a five-year grant from the National Science Foundation. It is our expectation that the Partnership will have demonstrated its success by June 2015 and that the program will be sustainable beyond the life of the grant. In line with these expectations, the MainePSP anticipates:

- Gradual transition to cost-sharing with school districts
- An ongoing professional development community—collaboratives, an active web community, and summer academies
- Continuation of partnerships across districts
Appendix A: List of Basic Materials Needed for Each Classroom (Teacher Toolkit)

The teacher toolkit is a collection of common materials found in most science classrooms that will be needed throughout the implemented units. Students typically work in lab groups of 3-4.

**SEPUP Teacher Toolkit**

- Plastic rulers, 2 per lab group
- Assorted dry erase markers, several per lab group
- Colored pencils, at least 1 set per lab group or classroom set
- Meter sticks, 1 per lab group
- Safety scissors, 1 per lab group
- Classroom set of impact resistant/splash proof goggles
- Scotch tape
- Masking Tape
- Graph paper
- Overhead projector or LCD projector

**PBIS Teacher Toolkit**

- Plastic rulers with groove, 1 per lab group
- Markers, 1 set per lab group or classroom set
- Chart paper
- Safety scissors, 1 per lab group
- Classroom set of impact resistant/splash proof goggles
- Phillips head screwdriver, 1 per teacher
- Masking tape, 3 rolls per teacher
- Graph paper
EarthComm Teacher Toolkit

- Electronic or triple-beam balances, 1 per lab group
- Alcohol or digital thermometers, 1 per lab group
- Hot plate, 1 per lab group
- Meter stick, 1 per lab group
- Drawing compasses, 2 per lab group
- Colored pencils, 1 set per lab group or classroom set
- Scissors, 1 per lab group
- Classroom set of impact resistant/splash-proof goggles
- Plastic rulers, 1 per lab group
- Protractors, 2 per lab group
- Graph paper
- Calculators
- Chart paper or white boards
Appendix B: Evaluation and Research

Required Research and Evaluation Activities
- Annual National Science Foundation K-12 District Survey (see below)
- Student content and attitude surveys
- Online teacher journals
- Teacher surveys
- Classroom observations
- Common assessments

Optional Research and Evaluation Activities
- Teacher interviews
- Classroom video
- Classroom-based research

Annual National Science Foundation (NSF) K-12 District Survey
As a requirement of continued NSF funding, the Maine PSP must complete a survey for each district partner every fall about the previous school year. The survey includes *district level information* about the district as a whole and *school-level information* about the participating schools within the district. The MainePSP anticipates that it will be able to obtain most of the necessary data through the Maine Educational Data Warehouse but may need assistance from district personnel in acquiring some data, especially those items labeled with an asterisk below. All required data is requested and reported in accordance with the Family Educational Rights and Privacy Act (FERPA).

**District level information required for all districts:**
- the number of K-12 individuals who developed and/or delivered MainePSP activities during the previous school year, listed by category (e.g., teachers, principals, guidance counselors)
- the amount of professional development provided by the MainePSP to teachers and administrators, both during the previous school year and since the beginning of the project, listed by category (e.g., teachers, principals, guidance counselors)

**School-level information required for all schools within the district that have participated in MainePSP activities in any capacity since funding began:**
- School name, NCES ID #, level of school (e.g. elementary), grades levels present and grade levels targeted by MainePSP
- whether or not the school has any teachers with self-contained classrooms (other than Special Education classrooms)*
- whether or not the school has any teachers who teach only math/science*

*Continued on next page*
School-level information required for all schools with a high level of participation:
(more than 30% of targeted teachers attended more than 30 hours of MainePSP activities
and/or more than 30% of student participated substantially in instructional activities
supported by the MainePSP)

- Demographic characteristics (gender, race, and ethnicity) of all K-12 teachers
- Demographic characteristics (gender, race, and ethnicity) of K-12 teachers who
taught science AND actively participated in MainePSP in the previous school year*
- Demographic characteristics (gender, race, ethnicity, participation in National
School Lunch Program, Special Education status, limited English proficiency status)
of all students at each grade level for grade 6 and higher
- Student achievement on all statewide, criterion-based, math and science
accountability assessments
- Adequate Yearly Progress (AYP) status in mathematics
- For high schools, demographic characteristics (gender, race, and ethnicity) of
students (a) enrolled in and (b) completing each college-preparatory science course
offered at the school*

Copies of the Teacher Consent Form, Parent Consent Form and Student Assent Form can be
provided upon request.
My signature below indicates that I have read the Maine Physical Science Partnership Memorandum of Understanding for Implementing Teachers and Schools and I understand the obligations of all parties.

______________________________________________________________
Teacher Name

______________________________________________________________
Teacher Signature

______________________________________________________________
Building Principal Name

______________________________________________________________
Building Principal Signature

______________________________________________________________
Curriculum Coordinator Name

______________________________________________________________
Curriculum Coordinator Signature

Susan McKay
Principal Investigator

Erika Allison
Project Director

______________________________________________________________
Principal Investigator Signature

______________________________________________________________
Project Director Signature