SMART INCLUDES Institute 2017 | Program Structure *

Schedule Overview

Saturday June 24th: Teachers and students arrive at UMaine, Orono
Sunday June 25th: Teacher professional development (PD); Student extracurricular activities

- Teacher PD content: Engaging in Cognitive Apprenticeship through inquiry in which teachers learn how to engage in collaborative inquiry with students on the science and engineering of stormwater. Teacher PD led by Dr. Jeff Wilhelm, founding director of the Boise State Writing Project which supports over 1000 teachers each year--including science disciplines--with over 30,000 contact hours of professional development.
- Learn how program aligns with NGSS or other State standards
- Expectations: be present at all PD sessions in June; during academic year, participate in monthly Professional Learning Group check-ins (share examples of application with students), tell story of your learning
- 3 CEUs provided
- See further details on Teacher PD content in APPENDIX - SMART INCLUDES TEACHER PROFESSIONAL DEVELOPMENT OBJECTIVES

Extracurricular activities will include using UMaine's state-of-art rec center, live music, campfire, comedy improv, hanging out in college dorms

- Stanford's Pam McLeod, Education and Outreach Manager for NSF Engineering Research Center leading improv

Monday-Thursday June 26-29:

Science and engineering of stormwater - see 2016 schedule for example (attached). Schedule for 2017 Institute will be longer, including more teacher professional development, and more focused on engineering and sensor development by students.

Friday 30th : Depart

2017 Institute Participants and Requirements

Teachers, students and University contacts from the following organizations are participating:

1. City College of New York
2. Mississippi State University
3. University of South Florida
4. University of North Carolina Charlotte
5. Boise State University
6. Stanford University
7. University of Alabama Birmingham
8. Missouri Institute of Science & Technology
9. University of Maine

SMART Institute capacity per school/organization

- up to 5 high school students
- 1-2 high school teachers - ***best for 2 teachers to attend***
- 1 University contact/program person (can be faculty member) to oversee progress of local SMART group throughout 2017-18 school year

Teacher Requirements

- Knowledgeable about evidenced-based inquiry
- Passionate about science and engineering of water-related issues
- Suggested population: look for award-winning teachers, past RET participants
- $1000 stipend to each teacher in 2 installments; $500 after June Institute; $500 after fulfillment of program participation contract
- Meet with students weekly (~2 hours)
- Participate monthly in online Professional Learning Community - led by trained PLC facilitator-teacher Cary James (1 hour month)

Student Requirements

- Rising juniors and seniors preferred; rising sophomore on teacher recommendation
- Highly motivated
- Previous knowledge of chemistry and algebra preferred
- Minimum GPA: 3.0 or on teacher recommendation
- Provide a written summary (capstone) project at the end of the academic year indicating your role in managing stormwater in your community
- Receive free room and board at UMaine institute
- Meet weekly with teacher-mentor and SMART group
- Be part of national research study
- Be a paid environmental intern
- Learn cutting-edge engineering skills
- Use exciting, new technology in sensors, drones, 3D printing

- Prepare for college and a career
- Earn $100 by end of year-long program by fulfilling program participation contract

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** Program funding is dependent on federal budget; program details are subject to change*

APPENDIX - SMART INCLUDES
TEACHER PROFESSIONAL DEVELOPMENT OBJECTIVES

1) Participants will name and understand the competing theories of teaching and learning in American education.

2) Participants will be able to name the theoretical principles and principles of action behind each theory.

3) Participants will understand how the approach being taken in this collaborative work with students is the approach called inquiry as cognitive apprenticeship and they will understand its principles, methods, why and how it works, the many benefits that accrue. They will understand the research behind the approach. They will understand how next generation standards, including the Core and the NGSS match this model. They will be able to name these principles in action in your work with the kids. They will rehearse how to transfer this model of teaching and its principles to other work they do with their own students - in other words, we will be working for transfer.

4) Participants will be learning how to use inquiry as cognitive apprenticeship as a teacher, but also as a reflective practitioner who teaches other teachers and engages in teacher research. The inquiry will have multiple layers:

- collaboratively participating in creating meanings with students and learning from students how to teach them better;
- engaging in action research, trying new actions and interventions, creating conscious competence and principles of practice, always extending their repertoires; and
- operating as public intellectuals, reading research together, deprivatizing their practices, and working as thinking partners by sharing their instructional moves, student work, and action research.

We'll also be working with systems change literature to work to create inquiry-oriented cultures in schools. Such a school will feature students who

- collaboratively exploring inquiry topics with each other and with their teacher and other experts, working together to create knowledge and usable, revisable, extensible, and archival knowledge artifacts and social action projects;

- developing conscious competence with threshold concepts and procedures for learning, problem solving, and meaning making that can be developed and honed throughout a lifetime; and
- inquiring into their own reading and writing, scientific thinking, learning about expert practice, monitor

Please see attached summary article by Jeff Wilhelm, "*Working Toward Conscious Competence: The Power of Inquiry for Teachers and Learners*." Voices from the Middle, Volume 23 Number 3, March 2016.