TUSD MSP Science Project Abstract

The goals and objectives of the TUSD MSP Science Project are:
Goal 1: Increase the number of teachers in grade 2-5 classrooms who are adequately prepared to teach science
Objective 1.1 – by the end of the project, participating teachers will increase their content knowledge by 10% as measured by the pre and post DTAMS assessments in physical (energy) and life science (organisms).
Objective 1.2 – by the end of the project, participating teachers will increase their content knowledge by 10% as measured by the pre and post *Making Sense of Science* course assessments in Energy and Organisms.
Objective 1.3 – by the end of the project, all participating teachers will be able to implement targeted science and engineering practices (developing and using models, engaging in argument from evidence) as measured by a project-developed observational protocol.
Objective 1.4 – by the end of the project, all participating teachers will increase the level of propositional knowledge s/he exhibits during the course of a lesson by 10% as measured by pre/post ranking of the Propositional Knowledge (content) section of the RTOP (Reformed Teaching Observation Protocol).
Goal 2: Improve student achievement in science in classrooms of participating teachers.
Objective 2.1 - Increase the percentage of students in participating teacher classrooms who reach proficiency as measured by pre and post *Improving Teacher Quality Project* curriculum evaluations for relevant targeted physical and life science units completed during fall 2015.
Objective 2.2 - Increase the percentage of students who reach proficiency on the appropriate grade level literacy standards for opinion and information writing as measured by the District and ATI 1st and 2nd quarter writing prompts.
Goal 3: Develop a science learning community at each participating school to build and sustain instructional capacity in science.
Objective 3.1 - By the end of the project, all participating teachers will increase the level of Communicative Interactions in his/her classroom as measured by pre and post scores on the Communicative Interactions section of the RTOP. This section assesses the ability of the teacher to engage students in discussions about what they're learning and how.
Objective 3.2 – By the end of the project, all participating teachers will develop and implement at least two science writing prompts in their classrooms that can be used to assess whether students are meeting the literacy standards for opinion and informational writing.
Objective 3.3 - By the end of the project, all participating sites will have a trained teacher to serve as a Science Facilitator to identify and support ongoing activities in science education and student learning.

To achieve the goals, 104 hours of intensive, high quality science content and pedagogy professional development will be provided to 40 teachers of grades 2-5. Fifteen elementary schools will participate as partners in the project, all of which are Title 1. The District will partner with the University of Arizona College of Science STEM Learning Center (UASLC).

The professional development will consist of three complementary components – increasing teacher content knowledge in physical and life sciences; increasing teacher pedagogical content knowledge in physical and life sciences; increasing the use of the scientific

practices of developing and using models and engaging in argument using evidence in elementary classrooms. These three components will allow us to address the gap between content knowledge and instructional practice leading to increased student achievement in science.

During the fourteen month project participants will receive 80 hours of specific content PD co-taught by an Instructional Team consisting of UASLC partners and TUSD science educators. Content modules from the WestED *Making Sense of Science* (Organisms and Energy) will be utilized. This work will be augmented by an additional field study of 7.5 hours to enhance and deepen the content gained in the MSS program. Participants will also participate in 16.5 hours of Science Learning Community (SLC) sessions incorporating the WestEd *Making Sense of Student Work* focused on pedagogical skills through lesson study, as well as additional work on effective implementation of the targeted science practices. Participants will attend a total of 104 hours in professional development designed to meet Project goals. The professional development timeline between spring and December 2015 is carefully constructed to allow for learning content, implementing content, and assessing and responding to student learning.

All aspects of the professional development program follow a specific structure of Learn the Content, Reinforce the Content Learning, Consolidate the Learning, and Implement the Content. Whereas the content and pedagogical content course have a strong focus on learn the content, reinforce content learning, and consolidate the learning elements of professional development, the sessions offered through the SLC have an additional emphasis on implementation. The TUSD Science MSP project provides an opportunity to deepen the scientific understandings of educators across the district in schools of high need.

The intended results of the TUSD Science MSP include building science concepts to meet teacher needs, as evidenced in our needs assessment, and providing structures for implementing science learning communities that support the translation of content knowledge into effective instructional practices. Finally, a culture of scientific thinking will be established through teacher team participation in the program. Ensuring instructional capacity of teacher teams at the 15 schools will support the sustainability goals of the project.