



Smithsonian

Science Education Center

Colorado LASER Initiative Proposal

Science Education Program Definitions

LASER Program: The Smithsonian Science Education Center's Leadership and Assistance for Science Education Reform (LASER) program is nationally and internationally recognized for the quality and impact of its leadership development work on the improvement of K-12 science education. In the United States, the LASER program's long-term goal is to educate leaders representing education, science, business, and government to change the prevailing culture of K-12 science education programs in school districts.

Science and Technology Concepts (STC): The Smithsonian Science Education Center (SSEC) has developed core science curricula--entitled Science and Technology Concepts.

Overview

Every human being is born with inquiry. We first open our eyes with instant curiosity. We explore and experiment to understand the world around us. Through the Smithsonian Science Education Center, the Smithsonian takes that spirit of inquiry to spark discovery in America's classrooms every day. The SSEC uses inquiry to change how K-8 classrooms look, feel, and work. We help the nation's teachers rekindle the yearning to discover and learn. While guiding students to become engaged in generating hypotheses, designing experiments, and finding answers.

The educational approach is straightforward, revolutionary and results oriented. The SSEC's portfolio of training programs, curricula, and resources have captured the attention of national and international experts. In the SSEC they see an opportunity to change students' attitudes, improve outcomes, and connect learning to future employment through the STEM disciplines: science, technology, engineering, and math. There is tremendous urgency to meet these goals. America and all nations recognize the economic need for a scientifically literate citizenry and workforce to take on 21st-century global challenges.

On any given day, the Smithsonian Science Education Center's inquiry-based approach gives students in classrooms across the country captivating, first-hand learning experiences. A group of fourth-graders in Texas may be putting final touches on the four-room house they have wired, complete with on-off switches, to demonstrate their mastery of electric circuits. A middle school student in rural North Carolina may be collecting data to measure and predict the effects of forces and motion. New Mexico eighth graders may be debating an evidence-based argument, and their newfound love of science helps them even as second language learners.

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The Smithsonian Science Education Center's Leadership and Assistance for Science Education Reform (LASER) Model leads to measurably higher student achievement in science by using inquiry-based pedagogy to improve classroom instruction, professional development for teachers, and the entire support system underlying excellent, equitable, career-oriented science education.

LASER consists of five essential elements:

- Individualized teacher training – professional development
- A research-based curriculum
- Materials support systems
- Assessment tools aligned with district, state, and federal science standards
- Ongoing collaboration with both administrators and business, government, and community leaders

Deliverables

- The SSEC will be responsible for all costs associated with these deliverables including training and curriculum units.
- The LASER implementation program will encompass four years.
- SSEC will also plan and convene a Strategic Planning Institute during the first year of the implementation.
- SSEC will provide staff to execute the project.
- Through the school district or school SSEC will provide a stipend of \$100 per day per teacher for summer teacher professional development training days. Training includes three (3) days in year 1 and year 4, and five (5) days in years 2&3. Currently projecting first training in August of 2014. This represents 90 hours of PD over the course of the implementation.
- Through the school district or school SSEC will provide an additional \$1500 stipend per year to a lead teacher/site director in each participating school for local facilitation and building communication. This teacher should be identified by the building principal.
- Provide project direction for all phases of implementation pertaining to the LASER project with select Colorado Schools.
- Maintain regular communications with identified local contacts in planning and execution of inquiry based science program.
- One (1) new unit of instruction for each grade level each of the first three years involved in the project to include curriculum and materials. One (1) two-use unit will be shared between two (2) teachers.
- Refurbishment materials provided for each unit based on two-use implementation.
- Level One Professional Development for all participating teachers for three (3) consecutive years starting in Year One of the project. Level One training focuses on inquiry pedagogy, common core literacy and math practices, science standards and unit storyline. Additionally the training provides specifics on unit materials and strategies including the use of science notebooks.

- Level Two Professional Development for all participating teachers for three (3) consecutive years starting in year two of the project. Level Two Professional Development is focused on the science content developed in the unit.
- SSEC will collaboratively design an appropriate evaluation for the project with an independent evaluator and report findings on a yearly basis.

Responsibilities of Participating Schools

- The school district will support the work of the project by doing the following to their best good faith effort:
 - Identify entire schools and all science teachers at each grade level for project participation.
 - Assure that each school is committed and maintained in the project for the full four years (2014-2018).
 - Provide local support to assure that teachers attend and participate in each day of professional development (YEAR 1: 3 days, YEAR 2: 5 days, YEAR 3: 5 days, YEAR 4: 3 days)
 - Minimize the reassignment of participant teachers.
 - Provide standardized test scores for participating schools.
 - Identify a contact and participate in regular communications with the project group.
 - Identify leadership teams (comprised of district administrators, school based administrators, lead teachers and a community or business partner) from each district to attend one 5.5 day strategic planning institute during year one of implementation. Leadership teams will also attend a 1.5 day follow up implementation institute to assess progress.
- Provide access to the school and implementation staff prior to the beginning of the project.
- Provide, if requested by the SSEC, release time for special training for identified individuals to build a local cohort of trainers. SSEC will reimburse the district up to \$100 per day for substitute reimbursement costs for these individuals.