

LOGIC MODEL: Evaluation of Project Goals, Procedures and Results of Development and Validation of ASC Curriculum

Stakeholders	Goals	Course of Action	Anticipated Results	Outputs: Data Collection	Analysis of Outcome Measures
Research and Development Team	1. Develop and validate the ASC curriculum with high school students who are underrepresented in STEM areas.	Establish 5 sites representing 10 teachers and 200 students	Engage diverse students in STEM activities in ASC curriculum	Teachers and students complete the curriculum; teacher and student surveys and pre/post content tests	Qualitative & quantitative data analysis
Participating teachers	2. Train and support teachers who implement the ASC curriculum.	Follow the framework for 5 levels of Kirkpatrick & Guskey for evaluating teacher PD: satisfaction, learning, organizational support, application, and student impact.	Teachers use the ASC curriculum effectively with their students and suggest modifications for improvement	Track teacher performance using baseline data on ASC scientific and inquiry skills compared to post curriculum assessments.	Analyze teacher gains in applying research-based strategies in teaching content, and engaging in sustained collaboration with outside experts (Descriptive statistics and qualitative data).
Participating Students					
Implementation Sites: Administrators	Determine the success of the ASC materials in fostering inquiry, critical thinking, problem solving, decision-making, design, and communication at increasing levels of complexity with student populations experiencing an achievement gap in STEM areas	Implement, evaluate and modify the ASC Curriculum in 5 locations with greater than 95% minority populations.	Participating students will improve in STEM content knowledge over the three years of the project.	Pre- and post-content tests of students participating in the program; surveys about attitudes toward science, STEM areas	Analyze gains STEM content knowledge for participating students on pre/post assessments (paper and performance)
Research Scientists at Minority Serving Institutions					
Research Scientists at NASA Goddard, Carnegie Institute of Washington, and IPTAI	Teacher Professional Development and Implementation Outcomes		Students Participation Outcomes		
Evaluation Advisor	<ol style="list-style-type: none"> 1. Use themes in astrobiology to teach complex thinking and challenge students with current issues and investigations from developing scientific areas. 2. Improve understanding and use of effective science inquiry methods focused on interdisciplinary science. 3. Contextualize science in students' lives by embedding instruction in their interests, experiences, and skills. 4. Work together with students to apply computer software and interesting technological tools in the analysis of scientific data sets. 5. Develop language and literacy across the curriculum in a way that promotes student competence in science. 6. Teach through Instructional Conversation and engage students in discussion through dialog. 7. Motivate high school students from diverse communities to pursue science and math courses by identifying and promoting traditional and non-traditional career opportunities in the STEM areas. 		<ol style="list-style-type: none"> 1. Increase student understanding of and comfort with the nature of science and the scientific process through the context of interesting real-world scientific investigation. 2. Demonstrate cognitive gains in science in the areas of biology, chemistry, geology, and astronomy through the integration of scientific disciplines in a manner relevant to each student. 3. Demonstrate skills needed to work in diverse groups to complete challenging investigations using real-world research. 4. Be able to communicate scientific concepts to others through informal conversation and discussion as well as through formal scientific discourse. 5. Engage in dialogue about ethics and controversial issues that face scientists and have conversations about the relationship of science and their culture (e.g. evolution and ethics in space exploration). 6. Increase student awareness and interest in science careers through shared learning experiences and exposure to role models from their culture. 		