

Leadership and Assistance for Science Education Reform (LASER)

Intervention Snapshot | Primary Science Topic Area

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WHAT WORKS
CLEARINGHOUSE™
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Scientists, science educators, and educational policymakers emphasize the importance of teaching students about scientific inquiry rather than focusing solely on scientific content. Inquiry-based science interventions aim to improve students' science proficiency by helping them understand scientific processes. In these interventions, students conduct hands-on investigations of science concepts and everyday phenomena, construct explanations for what they observe, consider alternative explanations, and communicate and justify their proposed explanations. Because implementing inquiry-based science instruction is challenging, the Smithsonian Science Education Center (SSEC) developed *Leadership and Assistance for Science Education Reform (LASER)*, a program designed to build capacity for effectively implementing inquiry-based science curricula in schools and districts. When participating in LASER, school or district teams attend leadership development institutes to plan the implementation of inquiry-based science curricula. These school or district teams receive support for key aspects of implementation such as professional development for teachers, access to instructional materials, and support for selecting appropriate assessments. LASER also helps schools and districts partner with scientists, science educators, and local business and community leaders who can promote and further support the implementation of inquiry-based science instruction.

This What Works Clearinghouse (WWC) intervention report, part of the WWC's Primary Science topic area, explores the effects of LASER on science achievement. The WWC identified two studies of LASER. One of these studies meets WWC standards. The evidence presented in this report is from one study of the effects of LASER on students, including 44% Hispanic, 31% White, 19% Black, 3% American Indian/Alaska Native, and 2% Asian students. LASER was implemented in grade 3 and 6 classrooms at the start of the study with outcomes measured after 3 years of implementation when students were in grades 5 and 8. Study schools were located in 16 urban, suburban, and rural school districts in New Mexico, North Carolina, and Texas.

Findings on LASER from the one study that meets WWC standards are shown below. The table reports an effectiveness rating, the improvement index, and the number of studies and students that contributed to the findings. The effectiveness rating is based on the quality of the designs used in studies, whether the findings are favorable or unfavorable for the intervention, and the number of studies that tested the intervention. The improvement index is a measure of the intervention's effect on an outcome. A positive or negative improvement index does not necessarily mean the estimated effect is statistically significant.

What Happens When Students Participate in LASER?

	Effectiveness rating	Study Findings	Evidence meeting WWC standards (version 4.0)	
		Improvement index (percentile points)	Number of studies	Number of students
The WWC found that implementing LASER: May result in little to no change in science achievement	No discernible effects	-1	1	6,291

FINDINGS ARE BASED ON:

1 study with 6,291 students in New Mexico, North Carolina, and Texas covering grades 3–8.



STUDENT CHARACTERISTICS:

Free & reduced-price lunch: 59%	Gender: 50% female	Ethnicity: 44% Hispanic
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What Does LASER Cost?

Costs of leadership development institutes vary based on duration, number of attendees, and facilities available. Teacher professional development, equipment, and material costs depend on the inquiry-based curriculum

the school district or school selects. The inquiry-based curriculum that the school district or school selects is implemented in students' regular classrooms during science instruction time.

LEARN MORE



Read more about the LASER intervention and the study that is summarized in this snapshot in the [Intervention Report](#). Contact the [Smithsonian Science Education Center](#) for additional information on implementing LASER.