



# Science Partnership for Articulation and Networking

## PROGRAM DESCRIPTION

### *Content*

- inquiry-based content
- instructional strategies appropriate for science reform
- curriculum replacement units
- school-wide reform
- teacher leadership
- student assessment

### *Context*

- diverse school settings including urban, suburban, and rural schools
- diverse student populations including a large population of minority and low-income students

Science Partnership for Articulation and Networking (SPAN) offers a thorough professional development program for schools interested in in-depth and sustained processes for department-wide change in science education. It became a middle school teacher enhancement program in 1997. However, it is an expansion of two highly successful programs: the California Science Implementation Network (CSIN) which began in 1988 as a statewide effort to improve elementary students' performance in science; and Scope, Sequence, and Coordination (SS&C), a high school program that originated in 1989.

SPAN's goals are to:

1. Develop on-site teams of middle school teacher-leaders, school science staffs, and administrators who are knowledgeable about the reform effort in science;
2. Provide in-depth professional development for entire middle school science departments on content (standards), pedagogy, leadership, and assessment;
3. Establish a systemic infrastructure that supports K-12 reform at the district and state level; and
4. Create an ongoing "Community Implementation Team" that maintains an advocacy for middle school science as a core subject.

SPAN received funding in 1997 from the National Science Foundation as a middle school teacher enhancement project. While relatively new, early results suggest that SPAN will lead to improved student performance.

## PROGRAM CONTEXT

One hundred and nine demographically diverse middle schools have participated in the intensive department-based staff development, directly affecting 160 lead teachers and 24,000 students, and indirectly influencing more than 870 science teachers and 130,000 students. Schools will continue to participate for a total of three years.

## STAFF DEVELOPMENT PROGRAM



The staff development associated with SPAN is based on the successful models employed in its predecessor programs. It centers on enhancing teachers' content knowledge; addressing teachers' practices and beliefs; facilitating acquisition of pedagogical techniques that are effective for all students; analyzing student work for conceptual understanding and student growth; engaging administrators and the community in the reform efforts; and developing teacher leaders.

Extensive staff development is designed for each school with the support of an implementation team comprised of staff, community, and parent representatives. Each school plan responds to the unique needs of the school while ensuring that the staff development program aligns with the National Science Education Standards & Benchmarks, and California's Science Framework.

Lead teachers from each school attend a 21-day institute; administrators attend a four-day institute; parents and community representatives attend a two-day institute. An additional 50 hours of staff development are provided on-site for the entire science department.

Ten regional, full-time directors are responsible for clusters of schools within their region and guide the efforts of 20 staff developers who work with clusters of three to five schools. Lead teachers and the implementation team, with the support of the cluster staff developer, regional director, and teaching cadres are responsible for creating and maintaining department-wide change in science education. Their change efforts cover a wide range, from policy changes to changes in classroom practice. This complex staff development effort uses a variety of models of staff development that extend beyond traditional training.

### *Process*

- training
- demonstrations
- modeling
- microteaching
- observations
- coaching
- curriculum development
- student work analysis

### *Intended Audience*

- entire school
- entire department or team

## **S**UMMARY OF RESULTS

The Science Partnership for Articulation and Networking (SPAN) increases student achievement in science in diverse middle school settings throughout California. In addition, it increases teachers' knowledge about science, instructional practices, and leadership skills.

## EVIDENCE OF INCREASED STUDENT ACHIEVEMENT

Impact on student achievement is based on only one year's test results. However, if it follows the success of its predecessors — the California Science Implementation Network (CSIN) and Scope, Sequence, and Coordination (SS&C), both of which have produced significant results for students at the elementary and high school levels respectively — the long-term results should also be significant in terms of teacher learning and student achievement.



### **Success Indicators**

- state content-area assessments



The assessment from the California Systemic Initiatives Assessment Collaborative (CSIAC) was given in a subset of middle school classrooms in the spring of 1997 to establish baseline data. The analysis of the baseline scores indicated that students in the SPAN schools were on par with their student peers throughout California and in other national sites such as Phoenix, Dallas, Puerto Rico, New Jersey, and Arkansas.

The same assessment was administered in 1998 and will be given throughout the duration of the SPAN grant. The assessment consists of enhanced multiple-choice questions, open-ended responses, and two performance tasks. It measures knowledge, skills, and scientific inquiry in life, earth, and physical science; science investigation; and science and technology issues.

The comparison of the 1998 SPAN students' performance to that of other students in the CSIAC network demonstrated that SPAN students outperformed their peers on every area measured by the assessment. The statistically significant improvement by students in the SPAN sample indicates that they had higher levels of performance on every aspect of the assessment. Teachers had gained additional strategies to use to teach the content successfully. Other indicators of success include increased teacher professionalism, increased teacher leadership, and district support for reform in science education.

### **THE BOTTOM LINE**



Science Partnership for Articulation and Networking is a comprehensive staff development initiative that emphasizes extending teachers' content and pedagogical knowledge and skills in the content area of science. It incorporates NSDC's *Standards for Staff Development* and aligns the context, process, and content to ensure high quality professional development that leads to increased student achievement in science.

## SAMPLE SITES



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## DOCUMENTATION

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