

Curriculum  
Materials



Professional  
Development

Materials  
Support



Assessment

Community/  
Administrative  
Involvement

# Science: *It's Elementary*

## Year One Highlights

After a year of implementation SIE is already making a difference.

What happens when a committed governor and legislature join forces with educators statewide to address the growing need for better science instruction at an early age?

The answer is plenty, judging from the Year One evaluation of Pennsylvania's *Science: It's Elementary (SIE)* initiative. This groundbreaking \$10 million effort was launched in Fall 2006 by Governor Edward Rendell to transform the way science is being taught to elementary children statewide. Participating schools have provided enthusiastic feedback about the program from the start — and now early indicators from an independent evaluator confirm that SIE is indeed making a very real difference.

SIE is an initiative of the **Pennsylvania Department of Education**. It is designed and coordinated by **ASSET (*Achieving Student Success through Excellence in Teaching*) Inc.**, a nonprofit education improvement organization in southwestern Pennsylvania with a proven track record of success in improving the teaching and learning of science.

**Horizon Research, Inc. (HRI)** — a nationally respected educational evaluation firm in Chapel Hill, N.C. — was contracted to observe and evaluate SIE's impact on science education in Pennsylvania in its first year. The evaluation used data from both the participants and program records to measure its impact in four key areas:

- **Student Achievement**
- **Teachers and Teaching**
- **Professional Development** and
- **System Alignment** (Supporting State Science Education Reform)

### *Science: It's Elementary* is Making a Difference!

SIE is impressive, involving 1,389 teachers, 74 schools in 68 districts and 37,000 students in grades K–6. HRI's report concludes that in its first year SIE can be credited with a number of accomplishments — and overall, teachers, students, principals and district administrators report very positive experiences with each of the elements of the SIE program. **Early indicators point to a program that is on track to making science education come alive in Pennsylvania's elementary schools.**

#### *Making a Difference for Students*

In evaluating student performance, HRI's research indicates that:

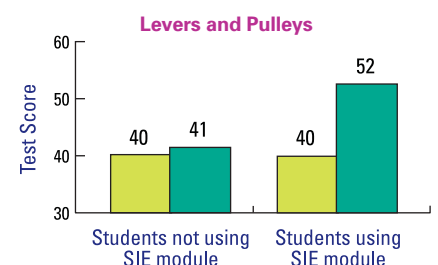
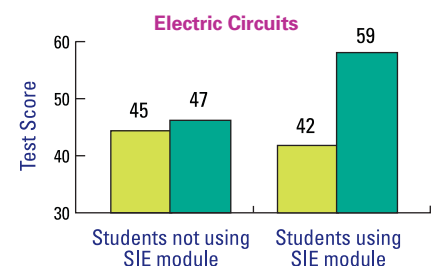
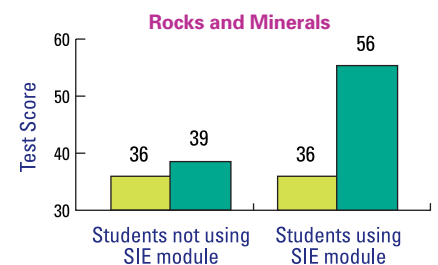
- In four of six comparisons, students receiving instruction using the SIE-provided modules\* by teachers who participated in SIE professional development, **scored significantly higher than students not receiving instruction** from that module — with impressive results ranging from 16% to 44% higher (see charts at right).
- Students of teachers who participated in all three days of SIE Professional Development (PD) scored even higher on the post-test (approximately 5%) than those of teachers who participated in only two days of PD — pointing to **a significant and positive relationship between full participation in SIE professional development and student achievement.**

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\* These are curriculum materials designed to engage a class of up to 30 students for nine weeks of in-depth study of a particular science topic.

### Student Test Scores

Students were administered a pre- and post-test to examine the impact of SIE modules and professional development.



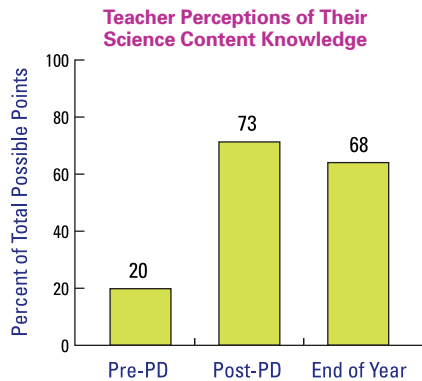
■ Pre-Test ■ Post-Test

- When selecting SIE participants, it is worth noting that **priority was given to those schools serving significant numbers of students who score below proficiency in reading and math.** In keeping with national trends, small achievement gaps among females and minorities were evident in SIE test scores, but overall student performance was measurably improved.

### Making a Difference for Teachers

Across the country, many elementary school educators feel ill prepared to teach science and often avoid it in the classroom. Participating SIE teachers confirmed that concern; HRI's teacher survey shows that prior to the program more than one out of every six participants (17%) taught zero science lessons per week.

After participating in SIE, however, teacher confidence jumped considerably. The chart on the right shows that **teachers' perceptions of their understanding of science content increased dramatically** through SIE's professional development.



### Making a Difference in Professional Development

Teachers gave high marks to SIE for effective and relevant professional development, as shown below:

- An overwhelming number of teachers (95%) indicated that **SIE professional development increased their confidence** in teaching using the SIE module.
- Similarly, more than nine of every 10 participants felt that SIE professional development was clear, carefully planned and organized, and gave them the chance to reflect individually as well as to interact with their peers to discuss teaching strategies for SIE science modules.

### Making a Difference in System Alignment

As part of its study, HRI evaluated the need for SIE to assist schools in the development of a coherent, cohesive and aligned system to support elementary science education reform.

- On a district curriculum alignment questionnaire, nearly one in three (32%) of respondents indicated that their district did not have a curriculum guide for science in grades K–6 prior to SIE. Each school district team developed a five-year strategic plan to implement SIE's hands-on, inquiry-based science education program.
- When asked how their school science program could be improved, teachers most commonly asked for more time for science teaching, more materials for teaching science, making science more hands-on, and developing a curriculum articulated across grades. SIE's curriculum materials, professional development and strategic planning activities support teachers in these areas.

### Suggested Improvements for Year Two

To build on the early success of Year One, Horizon Research, Inc.'s evaluation offered the following suggestions for *Science: It's Elementary* to integrate into its Year Two activities:

- Assist districts, schools, and teachers in developing curricula that align with state science standards and use SIE modules.
- Continue to refine the initial three-day Professional Development Program provided to teachers.
- With the increased need for additional trainers in Year Two, SIE should seek creative ways to recruit and effectively prepare more educators for this critical role.
- Work to further deepen teachers' science content knowledge and strengthen their vision of effective inquiry-based science instruction.



*“At the completion of the first module, I could already see my students becoming better writers, better thinkers, and lovers of science.”* Bill Wonders • 4th Grade Teacher, East Pennsboro Area School District

### SIE Fast Facts

#### SIE's Purpose

ASSET designed the SIE program based on a national model for effective science education reform.\* SIE's goal is to help schools and districts implement an inquiry-based, hands-on science education program with the ultimate objective of improving student learning.

#### What Did Schools Get in Year One?

Participating SIE schools received the following services at no cost to them:

- Three days of intensive professional development training for all their teachers in grades K–6;
- Research-based science instructional modules designed to promote hands-on learning in the classroom;
- Opportunities to engage in strategic planning to create support systems in their schools and districts for science education reform.

\* This model was developed by the National Science Resources Center, an organization of the Smithsonian Institution and the National Academies.

### For More Information

For details on *Science: It's Elementary* and Horizon Research, Inc.'s Year One Evaluation Report, please contact:

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