

THE NOYCE FOUNDATION 2006

"The role of the individual as thinker or prophet, as scientist or engineer, as entrepreneur or advocate, is not to be minimized. Yet these roles can thrive only in conducive social and industrial environments. Creative thinking can exist in the African bush as well as in Silicon Valley, but in the bush it will more likely revolve around new methods of trapping game than around artificial intelligence. Economies and societies are the laboratories that define the problems thinkers solve and on which entrepreneurs capitalize."

Robert N. Noyce

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# Letter from the Trustees

## Year in Review

The Noyce Foundation affirms its focus on mathematics, science, and literacy training for teachers in public schools, as well as on policy research to determine the effectiveness of professional development efforts. We continue to reexamine and rethink our own work, including Silicon Valley Math and Every Child a Reader and Writer initiatives, as a result of research that we and others have done recently.

After a very extensive search the Trustees were pleased to announce the appointment of Ron Ottinger as our new Executive Director effective October 1. Ron comes from a long career in education, both as the National Associate Director of AVID as well as a San Diego school board member and board chair. Ron is off to a strong start in defining our new focus on informal science as well as presiding over rethinking all of the Foundation's program areas.

Early in the year the Noyce Foundation Trustees determined that the Foundation should strengthen its investments in science, and that the most effective current leverage point is in informal science, the science experiences that students choose outside of school. The Foundation has long supported Science Friday, produced by Ira Flatow for National Public Radio, as well as programming in science-rich institutions in the Bay Area. In 2006 we sought to find programs that would involve students, particularly those in middle school, more directly. Our first investment was at the New York Hall of Science in Queens, New York, to support and expand to museums throughout the country their Science Career Ladder program, which involves young students in ever-expanding roles as explainers and leaders in the museum. This effort has been received with great enthusiasm by the science museum community. A second grant will allow the Future Engineers' Center at University of Massachusetts, Lowell to expand its program of kit-based after-school design experiences for middle school students. In the last part of the year we made a significant grant to the National 4-H Council to update and enhance its science, engineering and technology programming for dissemination across the country.

After many months of looking for an effective web-based approach to support our own teacher training efforts in math and literacy, we made a significant program-related investment in Agile Mind, a company that has been very successful in creating web-based professional development programs in high school mathematics courses from algebra through Advanced Placement calculus and statistics. This approach has created stable platforms for content and pedagogy and used the illustrative powers of the web to deliver just-in-time training to teachers. In 2006, as Agile Mind began to pilot middle school mathematics courses, the Foundation's mathematics director worked closely with both the company and with the Dana Center at the University of Texas at Austin to adapt our middle school math approach to the web platform.

We report with satisfaction the growing impact of New Leaders for New Schools and the growing ability of Teach for America to enroll outstanding math and science students into the teaching ranks.

The Rennie Center for Education Research & Policy led by Paul Reville continues to be a key voice in education policy in Massachusetts.

The Trustees are pleased to announce that Alan Friedman, the recently retired President of the New York Hall of Science, will become a trustee of the Noyce Foundation on January 1st. A physicist by training, Alan brings many years of experience leading informal science museums and will be invaluable in helping us think about effective approaches to informal science.

## About the Noyce Foundation

Inspired by Robert Noyce's example, the Noyce Foundation embraces a set of core values that guide our work:

- Great accomplishments are realized when *optimism* guides and inspires bold learning.
- *Creativity* and *risk taking* are the bedrock of innovation and essential to forging a healthy democracy.
- *Determination* to reach high levels of achievement is fundamental to attaining excellence.
- Social innovation requires *commitment* to stay the course.
- *Flexibility* and *speed* allow us to respond to new opportunities and changing situations.

Maintaining these values, the Foundation operates under the following beliefs and principles:

*We believe in building community.* We seek to establish partnerships whenever we make a grant. The more we trust and know each other, the more we can “push” each other, challenge assumptions, and benefit from each other's knowledge. We strive to learn from our partners and to share that learning throughout our community.

*We believe in focusing on content.* Rather than just working with a broad brush to improve practice, we aim our programs and our grants at improving specific knowledge and skills within the content areas of math, science, and literacy. We prefer professional development to be targeted and specific.

*We believe in focusing on the system.* Working exclusively with teachers without considering the systems in which they are situated is insufficient. We believe that the organizational context is critical and our strategies need to target key aspects and role groups in and around the system in order to see promising change. Whether the context is a school, a district, a non-profit organization, or a region, we aim to impact the environment to advance our mission.

*We believe in professional development.* We think practice changes through professional development, and we utilize multiple strategies coupled with high-quality curriculum, assessments, and standards to engage adults.

*We believe in fostering leadership.* Strong leadership is at the heart of a strong organization. We focus on the development of leaders in order to promote their ability to leverage change in the system.

*We believe in focusing on results.* We not only concentrate on improving results for students, but we also concentrate on improved results for all participants in the system. It is essential for us to know how well we are doing relative to our goals.

## Program Areas

### **Strengthening Instruction in High-Leverage Content Areas: Mathematics, Science & Literacy**

The Noyce Foundation focuses on strengthening classroom practice as a means to improve student learning. We work specifically on improving instruction in the areas of mathematics, science and literacy – the content areas that have the greatest potential for impacting a child’s future. Our content area programs are systemic in their reach; in addition to working with teachers, we target leadership throughout the educational system to effect change and support teachers. Our goals in the area of Strengthening Instruction are:

- *Mathematics*: to develop conceptual understanding and high levels of mathematical skill in all students, kindergarten through algebra.
- *Science*: to develop conceptual understanding, curiosity and scientific literacy in all students, with emphasis on middle schools.
- *Literacy*: to develop competent and creative readers and writers in all students, kindergarten through sixth grade.

### **Teacher and Leadership Development**

The purpose of teacher development projects supported by the Noyce Foundation is to improve student achievement. We provide support for continuing professional training as well as intensive support for teachers who are in their first two years of teaching. Additionally, we support the professional development of administrators. We aim to create concrete examples of powerful leadership and improved academic achievement within a system-wide context. Our goal in the area of Teacher and Leadership Development is to raise the quality and quantity of teachers and administrative leaders in order to improve student achievement.

### **Policy**

As a natural outgrowth of our focus on student achievement and systemic improvement of teacher practice, the Noyce Foundation has developed a formal active interest in impacting the policy arena. Noyce Foundation Trustees and staff have served in leadership roles for policy advising groups in both California and Massachusetts. Our work in policy aligns closely with our values and allows us to act quickly when a salient opportunity arises. Our goal in the area of Policy is to forge a centrist and activist voice on a small number of policy issues which directly impact our other goals.

# Noyce Programs

## Every Child a Reader and Writer Initiative

The Noyce Foundation's Every Child a Reader & Writer Initiative seeks to improve achievement in literacy for students grades K-5 through the key strategies of coaching, system-wide professional development, and assessment. The initiative is led by the Foundation's Literacy Program Director, Audrey Poppers. In 2006, the Noyce Foundation supported 37 schools in five Silicon Valley school districts with grants and direct professional development. Another 40 schools in 10 districts participated in a less intense effort. Over 15,000 students in Silicon Valley participate in the initiative.

*Coaching:* Literacy coaches from the participating districts receive monthly professional development on writing, writing pedagogy, coaching, and professional development strategies. These coaches then support teachers at their respective school sites and throughout their districts. In addition to coaching individuals to help improve their practice, coaches also plan and lead professional development to support implementation of the writers workshop model.

*System-wide Professional Development:* The initiative delivers a wide range of in-depth professional development in literacy, designed in consultation with several consultants, district coaches, and administrators. The professional development supports district and site administrators as well as teachers to infuse the writers workshop model into district classrooms. Teachers who are new to the initiative receive intensive induction training during the summer with follow-up instruction in exemplar classrooms throughout the school year. Additionally, there are grade-level meetings and workshops, and an advanced assessment workshop during the summer. Principals attend workshops, quarterly meetings, and structured visitations to classrooms to enhance their skills as instructional leaders. They participate in collaborative, facilitated group work to create coherent and cohesive professional development programs which support development of an improved literacy program within their schools.

*Assessment:* All students at participating schools are expected to develop a portfolio of their work to demonstrate what they have learned as writers. Two categories of student work are collected. These include: a collection of four pieces, one in each of four genres, to demonstrate accomplishment across a range of genres; and three pieces sampled from the beginning, middle, and end of the year, all in the same genre, to demonstrate growth. The portfolios are used for several purposes. For students – and for their parents – the portfolios are a record of accomplishment and pride; a tangible history of learning to write. Teachers use the process of choosing work for the portfolio as a strategy to help students learn to self-assess. Administrators learn much about the strengths of their writing programs by reviewing a sample of student portfolios. Every year the initiative collects a statistical sample of portfolios to assess how students are progressing across the initiative.

Although there is still much work to do, we are happy to report that the participating districts have shown progress, as evidenced in the student work and in teacher learning that is significantly impacting teacher practice in the classroom. This finding coincides with student achievement data from high-implementation classrooms – classrooms in which teachers have implemented the program well. Students in high-implementation classrooms outperform similar students in classrooms of teachers with less faithful implementation of the model. In addition, the results of the annual large-scale scoring of portfolios of work indicate that the number of students meeting the benchmarks – which are higher than California state standards – is increasing. In addition, English language learners make significant growth.

Currently the Foundation is working with local districts to establish a collaborative network and to fully transition the work to the local districts. This transition will take place over the next two years, culminating in a full transfer of responsibility by September 2008. This work has been more demanding than any of us – Foundation staff, partner schools, and school districts – ever imagined. We salute the persistence and dedication of all those involved.

Total Every Child a Reader and Writer Initiative: \$1,337,718

*Please visit our website <http://www.noycefdn.org/literacy/index.html> for more information.*

## Noyce Programs (cont.)

### Silicon Valley Mathematics Initiative

The Silicon Valley Mathematics Initiative aims to improve teaching and learning of mathematics K-12. It is funded by the Noyce Foundation, member districts, and the Santa Clara Valley Mathematics Project. The initiative is led by the Foundation's Program Director of Mathematics, David W. Foster.

In 2006, the Noyce Foundation provided grants to 22 school districts for professional development in math during the 2006-07 school year. That investment included coaching support for 276 teachers and approximately 9,200 students. The grants also supported professional development for nearly 625 teachers in 160 schools and approximately 31,000 students. In addition, there were 35 member districts of the Mathematics Assessment Collaborative, with 58,010 students in grades 2-10 taking the Mathematics Assessment Collaborative/MARS exam from approximately 1,160 teachers' classrooms. Each district focused its professional development work at targeted grade levels, with the largest concentration in grades 3-6. An increased number of students in the targeted grade levels achieved at the highest levels of performance on the MARS exam..

The initiative operates on the principle that by focusing on the key strategies of professional development, math content coaching, and performance assessments, student achievement as measured against national math standards will improve. The professional development programs involve teachers, math coaches, and site leaders in year-round math content sessions, summer institutes, professional growth workshops, and math network meetings. Principals and key district personnel attend training in instructional leadership, school change, and math pedagogical content knowledge. With intensive in-class coaching math teachers improve instruction by focusing on important content concepts and by developing techniques to support all students. Coaches vary the roles they play from modeling to team-teaching to critiquing lessons. Importantly, teachers regularly use performance assessment to inform their instruction.

In addition, SVMI sponsors the annual administration of the MARS exam, a summative math performance assessment, to its member school districts. The exam is an instrument to measure students' ability to solve non-routine problems, explain and justify their solutions, and promote high level thinking skills. We report the results of the MARS exam to all stakeholders throughout the school system. Beyond that reporting, we also analyze the student papers to examine student thinking and misconceptions. We produce that analysis in an annual document entitled *Tools for Teachers* that describes the student thinking, understandings, errors, and misconceptions derived from the performance assessments. The purpose of the document is to inform teachers and support improved instruction.

Despite challenging state policy and fiscal factors, the Silicon Valley Mathematics Initiative is showing healthy progress. We are pleased that the results of the MARS exam continue to show growth in student problem-solving and achievement, the professional development activities have expanded, and we are reaching more teachers and schools than ever before.

Total Silicon Valley Mathematics Initiative: \$2,089,568

*Please visit our website <http://www.noycefdn.org/math/index.html> for more information.*

## 2006 Grants

**American Physical Society** (College Park, MD) \$10,000

Support for the PhysTEC program, which works to improve and promote the education of future elementary, middle, and high school physics and physical science teachers.

**The Aspen Institute** (Washington, DC) \$125,000

Support for the Urban District Network on Secondary Instructional Improvement, in collaboration with the Strategic Education Research Partnership and the Dana Center/Achieve Urban Math Leaders Network, to help school districts identify common problems, with particular attention paid to improving student success in mathematics and literacy in middle and high school.

**Biological Sciences Curriculum Study** (Colorado Springs, CO) \$250,000

Support for the collaboration between Biological Sciences Curriculum Study and Agile Mind to co-construct a high school biology course and the development of a high school chemistry course.

**Boston Public Schools** (Boston, MA) \$20,000

Support for a study of the impact of mathematics professional development in Boston Public Schools.

**Carnegie Foundation for the Advancement of Teaching** (Stanford, CA) \$200,000

Support to produce four multi media websites featuring Every Child a Reader and Writer Initiative teachers in multi-lingual classrooms preparing and delivering an extended narrative study.

**Center for Enhancement of Science and Mathematics Education (CESAME)** (Northeastern University, Boston, MA) \$91,950

Support for the Young Scholars Program, a six-week summer program aimed at introducing high school juniors and seniors to careers in engineering.

**DeLong Middle School** (Eau Claire, WI) \$29,000

Support for curriculum-related staff development for math teachers in DeLong Middle School.

**EdSource** (Palo Alto, CA) \$20,000

Support for publication of Resource Cards on California schools, reference tools containing up-to-date statewide education statistics.

**The Exploratorium** (San Francisco, CA) \$300,000

Support for teacher training programs at the high school level and expansion to new schools and to the San Francisco Unified School District.

**MATCH School** (Boston, MA) \$12,000

Support for two recent math and science college graduates to work as full-time tutors to high school students at MATCH, an inner-city charter school.

**Mathematical Sciences Research Institute (MSRI)** (Berkeley, CA) \$25,000

Support for a workshop series on critical issues in mathematics education, including issues related to equity and social justice in mathematics education and international comparisons in mathematics education.

**Museum Institute for Teaching Science, Inc. (MITS)** (Boston, MA) \$25,000

Support for the 2006 Summer Institute for elementary and middle school teachers, "CSI: Cycles, Systems, and Inquiry."

**National 4-H Council** (Chevy Chase, MD) \$375,000

To support the Science, Engineering and Technology Initiative in its start-up phase as well as to support professional and curriculum development and program implementation.

**National Public Radio** (Washington, DC) \$300,000

Support for the Science Friday and Kids' Connection programs.

## 2006 Grants (cont.)

**New Leaders for New Schools** (New York, NY) \$300,000

Support to improve and evaluate programs to improve school leadership.

**The New Teacher Project** (New York, NY) \$25,000

Support to conduct a review and to plan for program improvement of mathematics curriculum for new teachers.

**New York Hall of Science** (Queens, NY) \$225,000

Support for continuation and dissemination of the Science Career Ladder program, which encourages women and minorities to pursue professions in science, to other science museums.

**Northeastern University** (Boston, MA) \$20,000

Support for the MathPower summer camp 2006 for students in grades 4 through 10, including documentation of materials and approaches.

**Rennie Center for Education Research & Policy** (Cambridge, MA) \$283,500

Support for policy work in the areas of research, convening, journalism, public education, and constructive activism.

**Resource Area for Teachers (RAFT)** (San Jose, CA) \$5,000

Support to help teachers use donated materials to teach "hands-on" math, science, art and technology to pre-K through grade 12 students.

**ScienceWorks Hands-On Museum** (Ashland, OR) \$25,000

Support for the Education Program Capacity Project, including the hiring of a full-time Director of Education.

**SEED School** (Washington, DC) \$10,000

Support for increasing students' access to fiction and non-fiction books for independent reading; and increasing teacher expertise on literacy strategies to use in their content areas.

**Teach for America** (New York, NY) \$100,000

Support for a Director of Math and Science Recruitment position, a Math and Science Recruitment Fellow position, and other MSE recruitment costs.

**The Tech Museum of Innovation** (San Jose, CA) \$50,000

Support for the 2006 Tech Challenge in which middle and high school students were challenged to design, build and operate a tool to achieve a specific task.

**University of Massachusetts, Lowell** (Lowell, MA) \$35,000

Support for DesignCamp 2006, a summer science and engineering camp serving students in grades 5-11 and support for the expansion of Design Lab to incorporate more projects and to accommodate more students.

**WGBH Educational Foundation** (Boston, MA) \$70,000

Support for the educational outreach and web components of Design Squad, an educational television program for children.

**Worcester State College** (Worcester, MA) \$7,600

Support for a study that investigates factors affecting college math success.

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