

# **THE NOYCE FOUNDATION STORY, 1990-2015 ACHIEVING HIGH IMPACT WITH LOW OVERHEAD**

**(Interviews and preparation of report by Meg Sommerfeld)**

## **WHAT THE NOYCE FOUNDATION DOES**

For the past quarter-century, the Noyce Foundation has been devoted to helping the nation's students become "curious, thoughtful, and engaged" learners in the fields of mathematics and science.

To achieve this objective, the foundation has focused its grant making on the following key areas:

- Improving the teaching of math and science in public schools;
- Developing leadership and improving human capital as an avenue to improve math and science teaching;
- Expanding opportunities for students to experience "informal science," or hands-on, active science education in out-of-school settings; and
- Education policy and research.

Despite being a relatively small foundation, with just three full-time staff members, a small but very active board, and a handful of consultants and advisers, the Noyce Foundation has punched above its weight in many areas as noted by our grantees and partners.

Major achievements:

- Creation of the Noyce Leadership Institute to develop a pipeline of highly qualified leaders for science centers and museums, both in the United States and around the world, and to encourage these science centers to be more responsive to their communities. Over 100 graduates all over the world are having significant impact in science centers.
- Creation of Inside Mathematics, a much used and valued multimedia website that brings together videos of top math teachers and students in the classroom, sample problems, lessons, and a variety of other resources to help classroom teachers improve and innovate in their math instruction.
- Built the informal science field to encourage and retain young people's interest and engagement in stem topics.

This year, after a quarter-century of such achievements, the foundation will close its doors. In a statement released on October 16, 2014, the foundation explained its decision to cease operations: "It has always been our intention to spend the Foundation's resources in a

timely way to address today's issues rather than to worry about preserving our resources in perpetuity. After 25 years of partnering with innovative organizations to design and support field-building initiatives that address our mission, the trustees of the Noyce Foundation have decided to sunset the Foundation at the end of 2015."

## **ORIGINS**

The Noyce Foundation was established in 1990 by the family of the late physicist, inventor, and computer industry pioneer Dr. Robert N. Noyce, co-founder of Fairchild Semiconductor and Intel, and co-inventor of the integrated circuit, better known as the microchip. Made out of silicon, his 1959 invention played a critical role in jumpstarting the personal computer revolution. In the decades that followed, the growing concentration of companies manufacturing silicon semiconductors were what gave Silicon Valley its name. Indeed, Noyce himself eventually became known as "the Mayor of Silicon Valley" for his leadership in bringing together consortia of companies to work together, and representing and speaking out about the sector's interests on a national level.

The Noyce Foundation was created by his family members through his estate, to honor the legacy of Dr. Noyce after his death at age 62 in 1990 of a heart attack. Its cofounders were his widow, Ann Bowers; his brother, chemistry professor Donald Noyce; and his daughter, Pendred "Penny" Noyce. As Ann recalls, "Bob's will stated that a foundation would be formed, but we had never gotten around to discussing what that foundation might do. So when he died very abruptly, I gathered his brothers and Penny to discuss what he might have wanted us to do. Well before 1990, he and a few others had been pointing out that the pipeline of students choosing to study math and science was shrinking, and that would have effects on the strength and stability of the US. The big question was why was it shrinking and what could one do about it. Consequently, the family decided that improving that pipeline in any way we could think of would be the focus Bob would have chosen."

Ann and Penny have served continuously as the foundation's guiding trustees since its inception, working closely together to honor Dr. Noyce's memory by supporting initiatives in education that reflect the issues he cared about most. "Ann just wanted to make sure the foundation was handled in a way that would honor Bob and do the things that she and Bob had talked about during their marriage—They wanted to make a difference," recalled Donna Teresi, who serves as the foundation's chief financial officer. "He used to say 'go off and do something wonderful.'" And that is precisely what Ann Bowers, Penny Noyce, and their colleagues at the foundation were determined to do. A statement on the foundation's website characterizes their approach: "In everything the Noyce Foundation undertakes, we are committed to promoting the qualities that Bob Noyce embodied: optimism, creativity, risk taking, and determination."

Ann and Penny bring a wealth of relevant experience to their respective roles as Chair and Vice-Chair. Ann had been a high-level human resources executive at Intel and Apple, and over the years has served as a consultant to prominent Silicon Valley start-up companies and as a longtime board member at several Bay Area nonprofit organizations. Penny, a

physician by training, recalls the career-changing impact of hearing of her father's sudden death: "I was really stunned. I went out in the garden and started doing some gardening work, thinking that my life is going to change, and I want to do something in education." In the years that followed, she began to divide her time between medical practice, her growing work with the foundation, and her increasing involvement in education reform issues in her home state, Massachusetts. She took on a leadership role in PALMS, a National Science Foundation-funded effort launched in 1992 to improve mathematics, science, and technology education in Massachusetts, and like Ann, took a leadership role on several education-related non-profit boards.

## **HOW THE FOUNDATION WORKS**

Over the past quarter century, the Noyce Foundation's approach to grant making has evolved, reflecting what the trustees have learned from their cumulative experiences as well as the institutional knowledge the foundation has gained about the fields it works in. There are ten core principles that characterize the Foundation's approach:

- Keep it small, simple, and nimble
- Don't accept proposals—go out and seek them
- Be hands-on
- Work with funding partners
- Develop sustained relationships with key grantees
- Focus on organizations with strong and committed leadership
- Insist that grantees be learning organizations
- Use convening, coaching, goading, and networking—these can be as important as money.
- Strongly encourage complementary organizations to collaborate ("arranged marriages")
- Seek to identify gaps in the field and then fill them.

### **Keep it small, simple—and nimble**

Ann, Penny, and their colleagues at the foundation value the importance of keeping operations lean and efficient. Noyce Foundation leaders are firm believers in simple, no-frills offices and keeping the number of employees to a minimum, only hiring as many full-time staff as absolutely necessary. When the foundation needs additional expertise, it has a network of consultants it can call upon to help its staff, board, or grantees.

Ann has said she finds it painful to see how much some foundations spend on elaborate headquarters or maintaining overly large staffs. "It is in my Midwestern blood you that you don't use your resources that way; you use them for the public good, and try to be as helpful as you can," she said.

“We bring into it a certain amount of humility,” agrees Penny Noyce. “We don’t want things like a glossy brochure, or fancy offices, or paying ourselves big salaries. We want to keep the focus on the work. . . It shouldn’t be the applicant coming hand-in-hand to us, but us looking for really great people doing exciting things.”

The foundation’s staff has always been tiny, currently consisting of just three full-time employees: Executive Director Ron Ottinger, Director of Administration Sara Spiegel, and Executive Assistant Sandi Maida-Callahan. Instead of a full-time CFO, the foundation calls on independent contractor Donna Teresi to provide these services. In that role, Donna Teresi sees the direct benefits of this approach. “I think the important lesson to highlight would be the fact they have run this foundation since 1990 on a shoestring,” she said. Sandi Maida-Callahan, long time executive assistant to both Ann and Ron Ottinger the Executive Director, agrees: “Our building is very simple, our offices are very simple, but we get the job done. . . . We do our job really well in the space we are in, and the money can go to the right places...it doesn't go to big beautiful buildings that are half-empty.”

The foundation’s board is also small, currently with just four members: Ann Bowers, Penny Noyce, Bob Schwartz, and Paul Goren. Schwartz is a Professor of Practice Emeritus at the Harvard Graduate School of Education; Goren is Superintendent of the Evanston/Skokie School District in Illinois. (Another longtime trustee, Alan J. Friedman, former executive director of the New York Hall of Science, recently passed away.) In addition, the board employs two senior advisors, Dr. Uri Treisman, Professor of Mathematics and Executive Director of the Charles A. Dana Center at the University of Texas, and Judy Wurtzel, an independent consultant who has been a policy advisor on education issues in the Obama and Clinton administrations. Together they provide advice, expertise, and guidance to the board on an as-needed basis, and both often attend its meetings.

Being small has a number of benefits, including the fact that it allows the foundation to make decisions very quickly. Multiple people associated with the foundation used the word “nimble” to describe the Noyce Foundation’s ability to identify a potential grantee, make a decision, award funding, and enable the grantees to begin work—all of which they said occurs at a speedy and efficient clip.

### **Don’t accept proposals—go out and seek them**

A critical reason why the foundation can keep the staff size low is that it does not accept unsolicited grant applications, “so they don’t need a staff of a bazillion,” said Ms. Teresi. “If you have four thousand grant requests, you are spending a lot of time weeding out the ones that you don’t want to fund.” Narrowing their focus to a limited number of topics also helps. “This way they can concentrate on what they want to do.”

The foundation does not issue RFPs (Requests for Proposals). This decision, made early, “was one of the core principles, that we would not take applications over the transom, but that we would go out looking for people doing great things,” said Penny.

The foundation does its own reconnaissance, seeking out the best groups in the fields it works in, and individually starting conversations with selected organizations. These conversations may lead to an invitation to apply for funds. Written applications themselves tend to be rather brief. Often, an applicant is invited to answer questions from the trustees during one of their monthly phone meetings. “We are an old-fashioned style of foundation,” said trustee Bob Schwartz, who directed the Education Program at the Pew Charitable Trusts before joining the Harvard faculty. “We are not creating projects and looking for people to run them, but we are trying to talent scout and invest in good people, and our grantees really appreciate that difference.”

### **“Hands-on” approach**

Perhaps more than anything else, the Noyce Foundation is known for its very hands-on approach to working with its grantees. The foundation’s founders, staff, and board do not view their role as simply to give money away. Instead, there is a strong focus on guiding, mentoring, and supporting each grantee, with a particular eye to helping develop the capacity of both the organizations and the people who lead them.

“I think we represent an interesting counterexample to the way many other large philanthropies operate,” observes trustee Schwartz. “To me that is the interesting part of the story. One thing we hear pretty consistently [from our grantees] is that they find working with us different and more satisfying than most of their relationships with other funders.”

When the Noyce Foundation gives an organization a grant, it typically comes with a significant set of commitments for both the grantee and the foundation itself. Grantees should expect to work with Noyce for an extended period of time, and this relationship will often include a great deal of back-and-forth communication, including regular “check-in” calls with the foundation. Uri Treisman, an adviser to the foundation’s board since 2002, said that the foundation’s staff and board members view themselves as investing in the growth and development of both people and ideas. This includes a certain amount of “engaging and challenging” them, added Treisman.

The foundation also spends a lot of time directly coaching and mentoring its grantees, with Ann in particular playing an active role, drawing on her experience as a former human resources executive. “We are very demanding that the goals represent outcomes rather than counting heads. We don’t accept the idea that by serving more students or teachers the organization will have a greater impact,” she said. “I tell them that ‘This is a long-term relationship you are looking at—so you will have to be sure you want this. Not only we will want reports, we will want to talk to you, we will send in consultants to work with you.’” Indeed, the foundation will not only give their grantees money for consultants to help them professionalize, they will help them identify the specific one who has just the right expertise. “Often they don’t have those people in their Rolodex—more often than not, we find the expertise for them,” Ann said.

Ann views her relationships with nonprofit leaders as an ongoing series of opportunities to share contacts and resources that help them expand their professional networks, learn something new, or adopt new practices that can help them grow or improve the overall health of their organization.

The foundation is committed to providing grantees guidance on everything from how to stay on track with a specific goal or objective, to bigger-picture concerns such as redesigning their business strategy or rethinking their mission. And it's not just the foundation calling to check in; their grantees also readily reach back to the foundation for assistance. "It is not unusual for them to call us up, and say 'We need help, can you help us?'" Ann noted. "They will ask 'We need a strategic plan. Can you help us find someone to work with us on it?'"

Nonprofit leaders also report that the foundation will in turn look to them as a valued source of knowledge about a specific field or topic they want to learn more about. Linda Kekelis, the chief executive officer of the nonprofit Techbridge in Oakland, CA, said she especially appreciates that the foundation treats its grantees as experts to learn from. In the human capital field, the foundation has called on the expertise of one of its grantees, Education Resource Strategies, to advise school districts and nonprofits on the best use of funding in districts, and it has asked New Visions for Public Schools to share its strategies for organizing and using data.

Overall, the foundation likes to engage in partnerships that lead its grantees to pursue bigger-picture thinking, said trustee Paul Goren. "We ask them 'What do you want? What would you change so you can have a bigger impact in the districts you are working with?' Dream a dream, and then operationalize it."

## **Partners**

The Noyce Foundation never is the only funder on a project because it is dangerous for an organization to rely on one funder for support. Executive Director Ron Ottinger explains: "There must be another funder, and the grantee must think about its mix of earned income and grant income to sustain its efforts."

In part, this stems from the foundation's desire to nudge its grantees to think about financial sustainability from the very beginning of any initiative. But the Noyce Foundation doesn't issue this requirement as an ultimatum, and leave its grantees to figure the mix out on their own. The foundation often works proactively to help their grantees identify other potential funders. Indeed, grantees frequently praised both Ann Bowers and Penny Noyce for their energetic outreach efforts to encourage other philanthropies to support their grantees.

"One thing that is their legacy is the willingness they had to leverage other funders—even if it meant they wouldn't get all the credit," observed Gil Noam of the Program in Education Afterschool and Resiliency (PEAR), a joint initiative of Harvard Medical School and McLean Hospital. As an example, Noam recalled a time when his organization was planning a two-

day meeting with the National Research Council, an event that focused on developing better ways to measure the impact of informal STEM education experiences. While he observed that the Noyce Foundation could have afforded pay for the meeting entirely on its own, the foundation purposely invited several other funders to co-sponsor the meeting, to help PEAR broaden the audience for its work and potentially cultivate some new funders. During the meeting, Dr. Noam noticed that there was a lot of positive “give and take” between the funders. This, he said, is a dynamic that does not always come easily in the philanthropy world, where each foundation tends to have its own distinct leadership, goals, strategies, and practices, and they are not necessarily concerned with what other foundations are interested in.

Dr. Treisman, the advisor, says it’s no surprise that Ann, having previously worked in and with many ambitious start-ups, has what he calls “a venture capital orientation.” “She will almost never be the sole funder,” he said. “She is always looking for who else believes in this, and . . . if it is only her, she is extremely cautious.” On the flip side, however, “Ann is always interested in making small investments to give a potentially powerful idea a shot,” he said.

An example of this interest in foundations working together is the STEM Funders Network. Executive Director Ron Ottinger helped organize the Network to broaden support for informal science programming. Members develop strategy together, share resources, hire staff to research specific issues, and opt in to co-fund high-priority projects.

### **Sustained relationships: In for the long haul**

The Noyce Foundation is no fickle suitor. It tends to identify and support a key set of organizations within a chosen field, and to develop and maintain close working relationships with them for many years. “We tend not to focus not on the projects, but on building and sustaining the organization,” explained Mr. Schwartz. “We want to work with them over a longer period of time, not the ‘three years and out’ syndrome that is typical of many philanthropies.” Often the foundation will start with a small, short-term grant for a very specific project, but will increase both the amount and flexibility of its funding if the relationship proves fruitful.

Linda Kekelis of Techbridge said she found it incredibly valuable that the Noyce Foundation was willing to provide a source of general organizational support. Techbridge was able to use the Noyce funds for any efforts related to its mission, which is to encourage girls in grades 5-12 to explore educational and career opportunities in science, technology, and engineering. In contrast, she has found that most funders tend to limit their grants to only supporting a specific project or two.

As a nonprofit leader, Dr. Kekelis said that the foundation’s broader, longer-term commitment significantly reinforced her organization’s ability to keep moving forward with its plans, and brought them a new level of stability. She said this is a reassuring contrast from situations when a major funder abruptly shifts directions, moving its focus

from elementary to middle schools, for example, or from engineering to physics. In such situations, she said, grantees can feel sudden pressure to follow suit to secure continued funding. Instead, Noyce “nailed what their focus is, and they aren’t changing it soon after they get started,” she said. “They look at groups that are doing [their work] effectively, ask them what they want to do, and then support them to do more and better. They have been a really steady foundation with a huge interest in afterschool time. “

This is not to say that the foundation just gives away money without expecting a certain amount of change and development over time in its grantees, said Gil Noam of PEAR. “There’s this sense of ‘Let’s work on this for two years and here’s some money,’” explains Dr. Noam. After the grantee makes some progress toward these initial goals, he said the foundation will help them develop the idea further, and then figure out what is the next logical step to take. If things don’t go as planned, at every stage in the process, there is always an exit strategy for each party: for the foundation to cease funding the project, or for the grantee to withdraw if they feel the partnership is no longer a good fit.

Trustee Paul Goren sees this long-term commitment as critical. “Many times in the philanthropic world, when the wind blows, you turn one way, you turn another way, and there is a frustration [with this]... There is something about staying the course, doubling down, paying attention ... I’m a real fan of the stick-to-itiveness: if there is a good idea and we have pursued a good idea, let’s stay the course.”

### **Focus on leadership**

Key to the Noyce Foundation’s decision to fund any grantee is its assessment of the strength and commitment of the organization’s leaders. This look at leaders goes beyond the Executive Director to the next level of management, potential successors to the leader, and the level of support and guidance provided by the organization’s board.

This approach to funding owes something to Silicon Valley’s culture of venture capital. “We look at philanthropy the way VC’s look at their investment opportunities,” said Ann. “We use the same criteria a VC would: leadership first, idea second, and a well-conceived plan to carry out the idea third.”

To earn the Noyce Foundation’s confidence, leaders must be well-informed, visionary, willing to take calculated risks, inspirational, and collaborative. Ideally, they should be seen as providing leadership not only to their own organization, but to the larger field. So important is leadership to the foundation that it started its own program, the Noyce Leadership Institute, to coach and inspire new and aspiring leaders of science museums and related centers of informal science learning.

The foundation expects leaders to remain focused on how to improve their operations and effectiveness over time. The foundation will often boost funding for formative and summative evaluation beyond what a grantee has requested. However, it also insists that the grantee seek to measure what really matters—impact on kids—rather than simply

gather easier and more proximate measures such as number of kids “reached” or satisfaction of workshop attendees.

One feature of supporting learning organizations is that the foundation is not immediately put off by a grantee’s failure to achieve certain goals. “They’re doing hard things, and we expect roadblocks and wrong turns,” said Penny. “What matters is how they process the problems and what they decide to do about it.” The foundation trustees expect grantees to be transparent and thoughtful about their failures rather than only trumpeting their successes.

### **Convening, coaching, and networking**

One path to helping organizations learn is to connect leaders of organizations that are in the same field to share learning and look for overlap and gaps where they could work together. One example is a day-long workshop with organizations focused on improving teachers and school leaders (referred to as Human Capital Organizations) like The New Teacher Project, New Leaders for New Schools, Education Resource Strategies, and New Visions for Public Schools. Another example is the STEM Funders Network, which has been very fruitful in conveying the power of out-of-school science and math programs. “Convening and networking isn’t terribly expensive,” says Ann, “but these efforts are not fruitful without a thoughtful process and a good facilitator. This is one way a foundation or foundations together can make an investment that can lead to breakthroughs in how an organization is thinking.”

### **Arranged marriages**

At times the foundation goes beyond convening and networking to strongly urge complementary organizations to collaborate. “We think people learn most by working together,” says Penny. To make collaboration possible, the foundation will broker meetings, compensate organizations for some portion of staff time devoted to the partnership, and even pay a consultant or fund a position to coordinate the effort.

An example of such an “arranged” (and three-way) marriage is work with the Baltimore Public Schools on developing a district leadership pathway, led by a collaboration among three leading human capital development organizations, Education Resource Strategies, New Leaders for New Schools, and The New Teacher Project. Another example is the already-mentioned Imagine Science project to bring informal science to the hardest-to-reach youngsters.

## **THE EARLY YEARS**

In the foundation’s early days, Ann and Penny together established the first of their core operating principles. “We really did not want to just be the bank, funding things where

nothing but money was required,” Penny said. The foundation does not, for example, give money to building projects or endowments. They also settled on an initial educational philosophy. As Penny said, “We would try to do something where kids would learn to use their minds well.”

Initially, three family members were the only trustees, and the foundation began providing exploratory funding to programs operated by other organizations. As it learned more, it began running some of its own programs as well—essentially functioning more like an operating foundation, which runs its own in-house programs instead of, or in addition to, giving money away to charitable organizations.

These programs included math and literacy initiatives, both of which emphasized the importance of strong professional development for teachers and school leaders. Penny explained, “We decided we would include early literacy as part of our portfolio, based on the notion no matter what great programs we created in math and science, if kids did not read well, they would not be successful.” By this time the foundation had begun to hire some program staff as well as to recruit other trustees from the field of education.

The foundation ran its math and literacy initiatives, primarily in Silicon Valley, through 2009, when an external study showed that, although the programs were much beloved and provided excellent professional development, there was little evidence of impact on student outcomes. An evaluation by Policy Studies Associates revealed that these and other highly regarded professional development programs nationally did not collect sufficient evidence to enable the researchers to link teacher participation in professional development to improvements in student performance.

“We just didn’t have the data,” Penny observed. “These programs were voluntary, and not well tracked. There was no connection of teacher records to student records, and there were gaps in the data where the subject was not assessed for a couple of years. . . . We had been running these professional development programs for eight or nine years in the same districts over and over again, because there is an unending need for professional development, and there is high turnover in teaching ... But we were not doing this for the fun of it, or just for the good of the teachers and their professional satisfaction.”

Unable to demonstrate the programs’ impact on students, the foundation decided to step away from both projects. The Every Child A Reader and Writer literacy initiative was redesigned as an independent grassroots collaborative that would continue its popular writing workshops on a contractual basis with districts. With the Silicon Valley Mathematics Initiative, the foundation’s trustees helped the leader, David Foster, spin off a separate organization. David continues to work with local districts as well as doing consulting work across the country. The math initiative’s work also continues in other ways, such as through the foundation’s creation of the InsideMathematics.org website. Inside Mathematics offers a collection of annotated videos showcasing teachers using new models of math instruction in the classroom, and they are widely used for teacher education and professional development.

Sara Spiegel, who curates the Inside Mathematics website, suggests that its popularity—in one week it has had as many as 17,000 visits from 14,000 distinct visitors—has taken off because the videos capture a sophisticated and highly-developed form of math teaching. In the wake of the Common Core’s release, Ms. Spiegel observed, “All of a sudden teachers were doing searches online about, ‘What does it look like to construct viable arguments and critique the reasoning of others?’ and we started to see all this traffic coming to the Inside Math website.” The Problems of the Month collectively get as many as 10,000 downloads in a week, and the Inside Math team continues to develop more materials to address the growing demand.

Spiegel believes that the foundation’s long-term investment and commitment to building teacher and school capacity through the Silicon Valley Mathematics Initiative was critical to the later success of the Inside Mathematics website. “Because the Silicon Valley Mathematics Initiative was working with a group of schools and their math teachers for ten years, their classrooms functioned at a really high level,” she said. “If we had just funded them for a year or two and moved on, I don’t think we would have been able to see the evidence of real quality teaching and learning, and teachers learning from student work.” Inside Mathematics will continue following the foundation’s sunsetting through a partnership with the Dana Center at UT Austin.

## **THE NEXT STAGE: DEVELOPING GRANTMAKING IN INFORMAL SCIENCE**

As it transferred its own programs to the field, the foundation trustees began to ask themselves how they could best address science education. A study co-funded by the Noyce Foundation and the Gordon and Betty Moore Foundation had demonstrated that the amount of science being taught in Bay Area elementary schools in the wake of No Child Left Behind was woefully inadequate. But the question remained, how could a relatively small foundation best use its resources to address such a widespread problem? “We made a decision that we were unlikely to be able to influence what happen in science classrooms in schools,” trustee Schwartz recalls, “but we could really focus on science learning opportunities, and how to expand them, in non-school settings.”

The trustees agreed that the foundation should shift its attention to the informal science world, and decided to place a particular emphasis on improving educational opportunities for children who lacked access to high-quality science learning experiences. They believed that all children deserved frequent and consistent access to opportunities to learn about science in a wide variety of environments and settings, including outside of the school day: afterschool, on weekends, and during the summer. Research findings also suggested that students would be more engaged in math and science learning if it was presented in a more interesting way—if they were exposed to a wide variety of hands-on, interactive, and challenging science experiences and activities.

## **THE NEXT STAGE: NEW LEADERSHIP, NEW FOCUS**

In 2007, the Trustees hired Executive Director Ron Ottinger, who had led a massive systems-change effort in afterschool systems in San Diego, to create an informal science program. As the president of the San Diego Unified School District's board, Mr. Ottinger had worked with the city's then mayor, Susan Golding, to start the first district-wide afterschool programs. Mr. Ottinger had also served for fourteen years as the National Associate Director of Advancement Via Individual Determination (AVID), where he worked to improve college-going rates for low-income middle and high school students who were often the first generation in their family to attend college.

"He had the experience running a national nonprofit like AVID, and he also understood the politics and policy of schools, school boards, and school reform. It is an unusual combination that serves him well," observed Mr. Schwartz. "He understands [systems] change, he can put himself in the shoes of a lot of people we fund, and he also understands the challenges of moving from the private side to the public side, and trying to move public sector organizations." And while Ron had not focused on math and science in his career, he had extensive experience organizing and scaling up smaller programs into larger ones.

Ron was drawn to work at Noyce by "the opportunity to work with very innovative and creative folks who were flexible and entrepreneurial, and who wanted to think big about how to really make a difference for kids, especially those who had been turned off to science and math." Ironically, as a child Mr. Ottinger had never enjoyed either subject. "I told them I hated math and science when I was in school, and my kids similarly hated math and science. I don't think it matters what income level you are at, only a small fraction of the kids understand the value of math and science, and are engaged in it. I wanted the opportunity to figure out how to get kids in this country to see how fun and exciting science and engineering can be."

The trustees challenged Ron to describe the field of informal science and determine what leverage points the foundation could address to increase its reach and quality. With the help of trustee Alan Friedman and many other advisors around the county, Ron created an ever more refined "map" of important roles and contributors to building the field.

With Mr. Ottinger now at the helm, the foundation decided that the most significant contribution it could make to building the field of informal science would be by funding the infrastructure, the tools, and the seed programs needed to give it stature. It would support efforts to build leadership in the field and seek to improve professional development for people working in it, which might also help reduce turnover, a major challenge in afterschool programs. The field also needed fewer "one-off" activities and more quality programs that were affordable, sustainable, and could be replicated to reach a mass market. To accomplish these ambitious goals, the foundation would work with national, state, and local organizations that were interested in hands-on science and had access to existing dissemination networks.

"Rather than creating a whole new initiative with a whole new set of organizations" under a Noyce brand, explained Mr. Ottinger, "we looked for existing organizational structures to work within. We provided seed funding and consulting support, and from the beginning we

required other funding partners and thought about how to help ensure financial sustainability.” He said they also required grantees to provide evidence that their efforts were making a difference. “This was not for our purpose; this was for building-the-field purposes,” he noted.

The board also established a science subcommittee that included Penny Noyce, Alan Friedman, and several consultants, including Cary Sneider, former Vice President of Educator Programs at Boston’s Museum of Science and Director of Astronomy and Physics Education at the Lawrence Hall of Science at the University of California. Dr. Sneider had also served on the writing team that helped draft the Next Generation Science Standards. This group talks every few weeks or monthly about specific proposals, as well as what larger strategic directions the foundation might explore. Sara Spiegel staffed the committee. “It was helpful to me to hear the thoughts of more experienced people,” Ms. Spiegel says.

## **DEVELOPING A FIELD-BUILDING STRATEGY**

Practitioners of informal science focus on student engagement, interest, and skills rather than on reinforcing school learning or boosting test scores. Through multiple iterations, Ron, the science subcommittee, and the trustees developed a sense of the puzzle pieces needed to help build the field. Roughly, these fell under the following areas:

**(1) Programs and curricula.** Informal science programs need curricula, ranging from simple activities to multi-week guided explorations. Some excellent curricula, designed with NSF funding, were being used only with only a small number of children. Along with funding efforts to catalog and rate existing programs, the foundation helped 4-H create, test, and evaluate two multi-week curriculum programs in wind energy and ecology. In addition, the foundation provided funding to help small but successful programs, such as Techbridge and Build IT, experiment with affordable scale-up strategies to reach a broader audience. Here the foundation’s strategy was to find the lead organizations in the field and support them.

Supporting the leaders meant a lot of interaction. Ann said of 4-H, “We were pushing them hard to put more science and math into their programs and to think about their science focus and how to bring it to the forefront.” Don Floyd, the recently retired CEO of 4-H, met frequently with the Noyce Foundation board, sometimes five or six times over the course of a year. He had conversations with Ron Ottinger even more often. “We asked them to be a different kind of funder, and to walk with us on a very different pathway,” Mr. Floyd said. “We asked, ‘What does this change look like, what does it look like for us to be different?’ We asked a very different set of questions that were mission-focused. We talked about what systems change really looked like, or how you would reach all these kids that no one was reaching.”

**(2) Professional development.** As the foundation worked with the field, a glaring need for professional development for front-line providers soon became apparent. The majority of afterschool and summer programs for kids are delivered by young people with little science

background, and turnover is high. Time and money are both too limited to allow for the kinds of professional development recommended for teachers.

The first step was to convince the leaders and frontline staff of afterschool programs that science programming was important and possible. For this initial work, the foundation supported The After-School Corporation (TASC) of New York as it took its “grass roots and grass tops” training strategy beyond New York to other cities.

At the same time, by surveying its partners, the foundation identified demand for short, just-in-time episodes of online training. This search for effective online training represents a rare instance where the foundation invited competing proposals from a number of potential partners and selected the strongest. Although at first the University of Nebraska-Lincoln seemed an unlikely choice, the trustees were impressed by the team’s experience creating videos and training materials, clear evidence of the team communicating with the field to understand its needs, and strong evidence that the University of Nebraska, from the president on down, was enthusiastic about the value and possibilities of the project.

What made the partnership especially successful, says Kathleen Lodl, an associate dean at the university, is that the foundation “had a vision for what would work and what would be useful, but they partnered with us to make sure it was the right vision. They spent a lot of upfront time with us, and did not just say ‘Here is our board’s vision and now we are going to find someone to do it.’” Through an iterative process, collecting data and feedback from the field at every step, from choosing a name to identifying what key skills to teach to critiquing the videos and website, the Click2SciencePD team and the Noyce Foundation sought to create something market-driven and useful to the field. Says Dean Lodl, “It was totally data-driven. They ask really good questions and they also really want to help you ask questions—it’s not ‘give the right answer and you get the prize.’ They are so connected and willing to help and bridge those connections.”

Eventually, Click2SciencePD created brief, annotated videos demonstrating twenty key skills for leading informal science activities. A key feature of the videos is that, although they can also be used by individuals, they were created specifically as tools to help trainers within youth service organizations work to prepare their front-line staff. The Click2SciencePD team continues to be both innovative and collaborative, launching several cooperative research and development projects with other Noyce grantees.

**(3) Leadership development.** As the foundation worked on its informal science strategy, Ann was involved in two searches for new science museum presidents in the Bay Area. She quickly realized that the pool of visionary applicants was thin. Working with consultant Lynn Luckow the foundation went on a search to find an inspiring leader to create and run a leadership program. They were lucky to find Geno Schnell, a highly respected consultant in the leadership field, who embraced the project and agreed to sign on as the project’s “dean.”

The challenge Ann presented, said Mr. Schnell, was “How do we create people who will lead change, and create organizations that are more relevant to their communities, and bring out a new kind of ethic in informal science?” For the past seven years, the Noyce Leadership

Institute has chosen 13 to 15 promising leaders from science centers around the world to participate in a year-long training program. For practice in leadership, each Noyce Fellow works throughout the year on a strategic initiative to better reach a difficult-to-serve sector of the community. Three “residential intensives,” small group conference calls, and individual coaching combine to inspire personal and professional development for the leaders.

Tim Ritchie was selected to be a Noyce Fellow in 2009, when he was leading the McWane Science Center in Birmingham, Alabama. “Participating in the fellows program was truly life-changing,” he observed. In his case, the fellowship year eventually led to his selection as president of The Tech Museum of Innovation in San Jose. For Ritchie, the fundamental purpose of the fellowship program was for its participants to be able to answer a single question: “Leadership for what? To be able to answer that question in a single sentence is a powerful thing,” he said. “Your efforts are measured not by how great an institution you are, but how great an impact you have. There is a grand canyon between those two points of focus. If you focus on becoming a great institution, that affects how you do what you do, how you say what you say, and how you measure what you measure. But when you focus on community impact, you only have so much time, and you want to spend that time focusing on the right thing. By being very insistent on leadership for community impact, Noyce Leadership Institute sets you on a very meaningful trajectory.”

The Noyce Leadership Institute has just graduated its seventh cohort of leaders. More than a hundred Noyce Fellows are now leading and working in senior roles with science centers around the world. This was a case where, finding no existing program to support, the foundation assembled a strong team and created its own.

**(4) Research and evaluation.** In thinking about sustainability, the trustees realized that continued growth and public support for informal science education depended on the field’s ability to demonstrate what it could actually do for young people. Besides helping programs design and carry out their own evaluations, the foundation supported free-standing research projects and expert conversations. It formed a multi-year partnership with Harvard’s PEAR, which began with PEAR cataloguing existing evaluation tools for informal science. But the effort didn’t stop there. As Dr. Noam of PEAR reports, “Most foundations go the route that ‘we have completed this, the report was distributed, now what?’ With Noyce, he says, “It’s not just ‘Here’s the money and do it.’ They convened the main organizations they are funding, and we held a meeting together in Palo Alto. Out of this came a common instrument of interest and engagement, with the idea that we distribute it to many, many people in the field, and it is now being used a lot.”

Ultimately, the foundation helped PEAR create a center to collect, warehouse, analyze, share, and make available for research data from a wide variety of informal science programs. Here the foundation’s major strategy, besides supporting good researchers, lay in challenging those researchers to expand their thinking and collaborate to address the field’s larger needs.

**(5) Policy, media, and advocacy.** The number of students involved in afterschool activities is huge, and especially for poor students, the vast majority of funding for this involvement comes from government sources. The trustees quickly realized that supporting the work of

policy advocates was a high-leverage way to increase the quality and amount of informal science programming available to kids. Here the foundation's strategy was to identify important policy groups and help them add staff with particular expertise in science education. This included supporting a science specialist at the Afterschool Alliance and funding a yearlong fellowship position for an informal science specialist to serve as a resource to the US Department of Education.

In addition, the foundation supported various forms of media outreach. It partnered with the American Association for the Advancement of Science to support two science media fellows, who are scientifically-trained people making a transition to the world of journalism. It supported Education Week's reporting on informal science and provided core funding to Science Friday as it migrated from NPR to independent status. Says Ira Flatow of Science Friday, "I think the Noyce Foundation will be remembered for crusading to make sure science survives in the classroom and with kids and students as a part of informal science . . . and not backing down from the challenge that teachers and students are facing as science comes under attack." He adds, "They have not backed down—they have gone even further in supporting us. Ann has not only been there with financial support, she has shown leadership, and more, she has helped give us direction, giving us a pat on the back when we were doing well, and giving us a pat on the tushy to get us doing better. She has always been a forceful, strong figure, kind of a mother figure we needed as we were growing up."

**(6) Networks to support the field.** In its work with informal science providers, the foundation continually sought to support and strengthen networks and professional organizations that those providers looked to for help and information. At times this search was frustrating, as a number of organizations proved weak or fleeting. One very fruitful partnership grew between the Noyce Foundation and the Mott Foundation. Mott had created a multi-state network of afterschool providers, and the Noyce Foundation brought in training and expertise to help those networks strengthen their science programming. Says Mott program officer Gwynn Hughes, "We have both pushed the field, in terms of looking for outcomes, in terms of helping programs increase science opportunities for kids. I feel like we've worked in concert on that, and Noyce's expertise has been essential to that effort. Because of the partnership, the field, not just Mott, has been able to accomplish and get so much further than we would have been able to do without them." This example demonstrates the trustees' commitment to partnership and willingness to support another foundation's work rather than try always to create something new.

## **WHAT MAKES THE NOYCE FOUNDATION UNIQUE? LESSONS LEARNED**

### **A small board that works hard**

The Noyce Foundation's board has typically numbered no more than six to seven members, compared to the average foundation board with a dozen members, according to a 2010 study by the Council on Foundations and the Foundation Center. "We have a small board, but it is a working board with working committees," observed Ann. The board is a very

hands-on and engaged group as a whole, and there are different “clusters” of work such as the subcommittee that focuses on informal science.

Serving on the Noyce Foundation board requires an enormous amount of time, said advisor Uri Treisman, especially in comparison to many of the ten or so other boards he sits on. “Most boards, you have a fiduciary responsibility, you sit on a committee, you listen very carefully . . . you provide general guidance and then you leave,” he observed. “That is not the Noyce board. At Noyce, you are in touch with each other every other week. You are assigned to advance, further, work on, protect, and advise the particular project in which you have a particular area of expertise.”

What makes Noyce’s board members willing to commit so much time to the endeavor? “It’s Ann, and it’s the work,” he said. “Ann maintains a really tight ship. Ann expects you to show up and put in the work. . . . It is a quirky beast. It doesn’t fit any prototype. It reflects the best parts of Ann Bowers and Penny Noyce’s personalities. These are tough ladies; they don’t suffer fools well. Ann has incredibly high expectations of the people who work with her, and a healthy skepticism about foundations in general.”

He noted that her partner-in-philanthropy, Penny Noyce, is a scientist and doctor who knows the STEM field well and writes about it. “She likes to do all of the analysis herself, and has all the skills to do it,” he said. “She has one of the best ‘crap detectors’ in the organization. But she also has a clear commitment, an enormous commitment to things related to girls and science involvement, to youth development, to informal science.” Both women, many colleagues add, are smart people who are personally committed, who ask the right questions, and get the people around them to look at things outside their comfort zone, in a way that propels their work forward.

Grantee Kathleen Lodl of the University of Nebraska-Lincoln Extension agrees, noting that she is impressed by how much time and effort the trustees put in. “This really is their passion, and they are willing to give the time to do this,” she said.

It also requires a significant commitment from the core family members. Donna Teresi, who serves as the foundation’s CFO, observes that many wealthy individuals are familiar with very large foundations and they have also heard of donor-advised funds, but many are not as familiar with small but extremely hands-on family foundations such as the Noyce Foundation. “You don’t hear about this kind of a model,” she said. “But if you are going to be a small foundation like this, you have to have someone in the family who is really willing to take this on.”

Penny said that it is Ann who runs all the “nitty-gritty of the foundation, and I am very content to let her do that. . . . Whenever we have a board meeting we come up with all these wild ideas, and Ann is the person who will say ‘We don’t have the staff to do this,’ or ‘Let’s find out who the partners are,’ and I am the person who is likely to say ‘How can we tell if that is going to work?’ She is the expert on organizational culture, and my job is more to reflect on how we know if it is working.”

Over time, she said, the foundation has become increasingly professional, evolving from an informal small family foundation to one with somewhat more formal structure. But throughout this, the board has retained its commitment to making all of its decisions by consensus. “Every once in a while someone will say ‘we should have a vote on this,’” Penny said. “And then we have a vote, and it’s unanimous!”

At this moment in time, there is a huge international transfer of wealth across generations taking place. Experts at the Center on Wealth and Philanthropy at Boston College have predicted that between 1998 and 2052, some \$41 trillion in personal wealth will change hands from the aging baby boom generation to their younger heirs. As these funds are handed on to the next generation, some recipients are already thinking about what kind of charitable giving they might want to do.

Initially, there is a natural tendency for many of these young philanthropists to “want to be the cause of a lot of improvement personally—they don’t understand the difference between the foundation acting as the support or as the operator” said Dr. Treisman. “But these are different roles.” Ann Bowers, he said, has figured out how to do both “in a way that has integrity, discipline, and accountability.”

Indeed, many wealthy individuals have reached out to Ann seeking advice on how to start a foundation, and she is very straightforward in her response. “I get calls all the time from people wanting to know how to do this,” she said. “And I say, ‘This is a commitment. It’s going to take a lot of time. Are you sure this is what you want to do?’” Ann warns them that running an effective foundation requires considerable effort, and for some, a donor-directed fund at a community foundation might be an easier and more realistic alternative. “A lot of people in Silicon Valley think it is cool to start a foundation and don’t know what they are getting into,” she adds. “When I can, I tell them how much time is involved, and that it is not about patting ourselves on the back.”

### **Investing in smart people**

For those who are willing to put in the time, several philanthropic lessons can be gleaned from how the Noyce Foundation approaches both its grant making and its overall operations. First, it emphasizes investing in organizations led by smart people. “We picked the organizations we thought are strong and give leadership in the field,” explains Ann.

But she does not just judge by first impressions. Ms. Bowers said the foundation is “very, very careful in assessing the leadership of the groups of the people we want to work with.” She said it is often the case that organizations who are led by smart, passionate people tend also to have smart people working in the next level and so on throughout the organizations, and she takes note of this as well.

Investing in smart people also applies to the foundation itself. Donna Teresi, the CFO, said that one of the things Ann has been particularly effective at is hiring people like Mr. Ottinger and Ms. Spiegel. Ms. Teresi says she would advise prospective philanthropists:

“Make sure your hires have a real strong background in the subject area that you want to fund, know the issues well, and have good ideas about whatever topic you want to address, and how it is going to move forward.”

Many of the foundation’s grantees praised the key hire of Mr. Ottinger as a strong coalition builder who is skilled at linking people together and bringing together people, projects and programs, and who works effectively with both Ann and Penny. Dr. Kekelis of Techbridge praised Mr. Ottinger as an “incredible” advocate for Techbridge: “They picked someone who is a lovely person. He is very approachable, positive, and warm. He makes you feel good about the work you are doing, helps you connect with other people, and broadcasts your accomplishments to other groups. He helps you to help your organization.”

### **Not just an ATM: The gift of time and expertise can be as important as money**

Some see the foundation’s model of how it operates as almost countercultural in the field, said trustee Bob Schwartz.

Don Floyd, the retired CEO of 4-H, said of the many foundations he has worked with during his long career, Noyce is one of only two or three that stand out as particularly effective. He recalls getting to know Ann through his board chairman Lynn Luckow, who is also an advisor to the Noyce Foundation. It started with the extent of interactions Mr. Floyd had with the foundation, which included multiple in-depth conversations over the course of a year with deeper levels of questioning than was typical. At that time, he said, the foundation was in the process of shifting its investments to the informal science world, and Ann was looking for partners with experience in and knowledge of the field.

“She was much more probing of principles and values than others were,” he said, “She’ll call you up and say, ‘What if it is not about money, what does it really take to make this kind of change?’ And she would ask things like, ‘What are the toughest questions we can ask and learn from each other?’ ”

It was far from the typical grant-seeking process that he had experienced with most other foundations. “When you work with the principal, it is a different set of questions,” he observed. “She was spending *her* money, and this was about a deep personal understanding of a system shift.”

That long series of conversations eventually led to the first Noyce grant for 4-H. “I’ll never forget when she made the decision to fund us,” Mr. Floyd said. “She said ‘This is not about the check, this is about a partnership. So if you want a partner who is going to ask you tough questions, then sign on the dotted line. But if you don’t want to do that, don’t sign on the dotted line.’ I loved that!”

Dr. Noam said his interactions with the foundation drove home for him the importance of working more closely with other researchers, and remembering to keep in mind the

importance of their own research contributions and practices. This “playing in the same sandbox” is something he said many researchers are not very good at doing.

“I learned a lot,” he said. “I like the way they can create that collaborative spirit...to be a part of this larger vision, and shape certain parts of it, and know that they were working with others to shape other parts in a very productive way.”

He said he also learned that in the best relationships with foundations, grant makers could also become your colleagues. “When I got my first grant, they wanted to meet once a month on the phone. At first I felt like, ‘Oh, this is probably mostly because they don’t quite trust that I am going to keep the timeline, so this is an elegant way to keep track of the timeline . . . but it very fast morphed . . . into a really substantive discussion, and my receiving a lot of information from them about the field, and new things that were happening.”

### **Staying humble**

As the Noyce Foundation winds down, Penny Noyce has this to say about what advice she would give to prospective philanthropists, especially those seeking to start a family foundation.

- Do something that needs to be done.
- Look for good partners. Find great people to work with and be humble with them: never think you are better than they are just because you have money and they don’t.
- Know your family dynamics really well and understand where you fit in them. Foundation family dynamics are “really, really” important and family members need to understand their unique roles.
- Focus on your devotion to the vision of the founder.
- Professionalize—but don’t rush this. Don’t do this right at the beginning, such as by hiring a big staff. But as soon as you know what you are doing, it is good to bring in people to do the work, to do things more efficiently. You just need to do so gradually, over time.
- Don’t glamorize your role too much; look at your work with the foundation both as an opportunity and a solemn trust.

“I think one thing that has bound Ann and me in this is that we used as a touchstone, ‘What would my father think of this?’ ” said Penny. They would ask each other questions such as “Were we being entrepreneurial enough? Were we being bold enough? Were we being too bureaucratic? Were we being too caught up in ourselves? Were we keeping our eye on what matters?”

After her father’s memorial service in 1990, Penny reports, one of her medical school professors came up to her and said, “I was impressed by how many people mentioned how humble your father was.” Humility helps keep the foundation learning, and helps to make

sure it remains respectful and helpful to its grantees. Only with humility can true partnership arise.

As the founding trustees of the Noyce Foundation, Penny Noyce and Ann Bowers would like to acknowledge the contribution of past and present trustees and key advisors:

**Trustees**

Donald Noyce, founding trustee

Ethel Schultz, first non-family trustee

John O'Neil

Alan Friedman

Phil Daro

Robert Schwartz

Lester Strong

Hilary Pennington

Paul Goren

**Advisors**

Uri Treisman

Cary Sneider

Judy Wurtzel

And our remarkable staff:

Ron Ottinger, executive director

Sandi Callahan, executive assistant to Ann and Ron

Sara Spiegel, director of administration

Donna Teresi, acting chief financial officer