IN THEIR OWN VOICES: MUSEUMS AND COMMUNITIES CHANGING LIVES

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Philadelphia-Camden Informal Science Education Collaborative (PISEC)
The Franklin Institute, Philadelphia, Pennsylvania, 2011
contents

1 foreword
5 profiles
61 in conclusion
66 appendix
69 PISEC publications
70 acknowledgements
Reflections on 18 Years of PISEC

The PISEC group was formed in 1992 in response to a request from The Pew Charitable Trusts, to create a project involving four Philadelphia area science institutions: The Franklin Institute, the Philadelphia Zoo, The Academy of Natural Sciences, and the New Jersey State Aquarium. Education directors from each institution took on the challenge. From that process emerged the idea of a Family Science Learning Research Project (FSLP). While Pew was not an initial funder of the FSLP, the National Science Foundation (NSF) was sufficiently interested to offer a grant. Pew subsequently provided matching funds.

FSLP focused on increasing active family learning in museums. It began with observations in the galleries. We were seeking “performance indicators”—behaviors that correlate with active family learning. Over time, we honed the measures and eventually formulated a list of seven characteristics of family-friendly exhibits:

- Multi-sided
- Multi-user
- Accessible
- Multi-outcome
- Multi-modal
- Readable
- Relevant

Next, each of the four museums applied the seven characteristics to develop a family-learning component—an add-on interactive to enhance a selected exhibit. Two of the components were added to interactive exhibits; two were added to exhibits with living collections. The add-on components, were intended to increase the incidence of active family learning. Learning was measured independently using content questions.

In each museum, we saw a measurable increase in active family learning with the enhanced exhibits. Moreover, we saw that the learning unit in the museums is not the individual, but the small group. People do not go off all by themselves to learn and study; they talk to one another, and that is how museum learning happens. Another observation that emerged from this study was that not all the information that is exchanged comes from the exhibit; the exhibit is a catalyst for encouraging family interaction. Family members bring information from their personal histories to those interactions.
The most important practical result of the FSLP was the understanding that we should be shaping our exhibits to work for families and other small groups such as the “school pod” — a chaperone and a set of students. The seven characteristics are a significant addition to our knowledge of how to design exhibits for groups.

In addition to providing new information about how families learn in science museums, the Family Science Learning Project set the stage for collaboration on further questions. If traditional family audiences learn well as a unit in the museum, could we use the same model to reach and engage non-traditional family audiences? How could we involve families that do not visit museums?

The audiences of the four PISEC museums were less diverse than the neighborhoods surrounding these inner city institutions. We were eager to extend hands-on science learning to a new set of families who were not familiar with the idea that science is something a family can enjoy together.

Following the completion of the Family Science Learning Project, PISEC proceeded to create a series of programs building on the idea of family learning, reaching underserved communities to engage non-traditional families in science experiences.


What we took away from Community Connections was a sense that we needed to move away from “science light” and museum marketing, and focus more on engaging people in science activities. A significant segment of the PISEC families was interested in digging deeper into science, and we wanted to fill this need.

When we planned the next project, we solicited input from all partners. That is how we learned that people wanted more involvement in science. The name of the next project, Families Exploring Science Together (FEST, 1999-2003), indicates the emphasis on family engagement. We assumed that if we involved families in hands-on science, they would want to come to the museums. That seems to be the result.

FEST had four different kinds of science-based programs, including workshops at community centers. Many families who had been part of Community Connections continued their involvement. Some of them took more leadership, while others remained consumers. Participation built through word-of-mouth as well as through intentional outreach.

What emerged from FEST as the next step towards community involvement was the idea that we could increase capacity for science engagement by training people
from the community (“science ambassadors”) to do science workshops. In the next *PISEC* project, *Community Ambassadors in Science Exploration* (*CASE*, 2003-2009), they would be able to present their own workshops, rather than rely on staff from the museums. Hands-on family science workshops became part of the CBOs’ (Community-Based Organizations) repertoire. The *CASE* program involved recruiting and training a corps of teen and adult science presenters. We trained 144 science ambassadors, and provided a total of 24 workshop kits for each community site.

The success of *CASE* led to the development of the next project, *Communities of Learning for Urban Environments and Science* (*CLUES*), which began in October, 2009. In *CLUES*, each CBO has an apprentice who works full-time in one of the museums each year and learns to develop family workshops. *CLUES* advances the transfer of knowledge, leadership, and resources from the museums to the communities.

This next step is challenging, since many of the apprentices lack academic training and research skills. With training, they are becoming educators in their communities and, potentially, members of the science museum community.

*CLUES*, is not taking “high potential” individuals from the community and placing them in another environment. Instead, the apprentices continue to be very closely tied to the CBOs, creating and coordinating workshops on site. We are hoping to give the CBOs a stronger foothold in the museums, while also increasing capacity in the communities themselves.

The longevity of the PISEC programs has given us the ability to have a significant impact on participants. Some of those who started in PISEC programs as young children have grown up as members of the PISEC community. Science has become central to their lives. They really enjoy it and it changes the way they think about the world. Science activities are a wonderful, positive alternative to the other things going on in low-income communities. Some people are even pursuing careers in science. It is another path.

Individual families within CBOs have become the center of learning communities that are now able to share this orientation with other community members. Natural leaders and teachers have emerged. They are the ones who have taken ownership of the process. They are changing the family environment in which the children grow up.

As we conducted the *PISEC* projects, we celebrated the families that attended the greatest number of events each year. One of the winners attended twenty-three *PISEC* events in one year! We began to wonder what it was about these people that caused them to become so engaged with the program. We did a little study of the fully engaged group and could find nothing in their demographics to explain why
these particular families would get so involved with PISEC. There were no significant educational, economic, or ethnic differences. We needed to do some more digging to find the answer to the question.

When a program is evaluated, especially during summative evaluation, you tend to look at all participants or at a random sample. As a result, the most engaged users of the program can “disappear” in the data; their patterns are swamped by people who do not become fully involved with the program. Consequently, group averages do not give a picture of the full impact of the project.

We started doing interviews with fully engaged individuals to see what caused them to become so involved. What we found is that they are not linked by a demographic category like mother’s education or science background. Rather, they are creative, intelligent, resourceful people who saw what this program could do for their families. They are very different from one another, and that is where the idea for the In Their Own Voices book was born.

We realized that, in any large population, some individuals will optimize a program. If you offer a good program and observe its audience, exceptional people will emerge.

We noticed our most engaged participants because we saw them at every event, and we got to know them. We saw that they really were special—they are “gifted” families. As a result of looking carefully at our audience, we have learned an important lesson: do not look at average numbers alone. Our most engaged participants would have been lost in the numbers if we just looked at averages.

PISEC’s long series of programs made possible the emergence of people who self-select for prolonged engagement. In a sense, we have provided an enriched soil that allowed these families to grow.

PISEC programs have a great reach. There are currently 9,000 families in the database. Some came only once, possibly because the program was not the right fit for them. PISEC is a program for people with children and for people who enjoy hands-on participation. The group of highly engaged users shows the maximal potential of the program. For the right people, PISEC has become a truly life-changing opportunity.
In Their Own Voices

The following are interviews with people whose long-term involvement with the PISEC program has been life-changing. Most started as participants, with or without friends and family, and over time became PISEC leaders.

Most of those profiled here are parents. Because PISEC programs are geared to families, these parents brought their children to events starting at a very young age. As their children grew up in PISEC, they too, became involved with the program. In some cases, children took on leadership roles of their own; in other cases, children’s interest in science activities and studies grew over time.

Whether or not individual parents or children go into science-related fields as a result of PISEC, they have become advocates of science as a family experience. Their experiences and attitudes are the key to ensuring the ongoing involvement of their communities in science education, activities, and programs.

Minda Borun
Director of Research and Evaluation
The Franklin Institute
Soynia Booth is a mother of two grown daughters and a grandmother of four children. For her, PISEC programs have offered a new and important way to connect with and help educate her grandchildren.

**TAKEAWAY MESSAGE FROM SOYNIA BOOTH:**

*I guess I just like spending quality time with my family. When I can’t afford to do things I’d like to do with my grandchildren, CASE allows me. I’m on a fixed income, and [when] the kids want to do something and I’m thinking, “Well, I can’t afford to take them to the movies,” but I can always call CASE and say, “CASE, I’d like to come to the Zoo,” and they’ll say, “Hey, no problem!” and we go to the Zoo. So, it allows me to do activities with the kids even when I don’t have any money in my pocket.*

Soynia values PISEC programs for their quality and affordability. They provide her with an accessible, educational alternative to TV and video games. As a grandmother, she’s also grateful for the support she receives from PISEC staff in engaging her four young grandchildren.

*Everything that the CASE program allows me to do is really enjoyable because, when I do the events, I do them with my older children and my grandkids. It gives me a chance to do family outings with them. It makes it affordable for me to go to the Zoo, sometimes two*
[or] three times a year. We’ve been to the Aquarium last year . . . which I had never been to. I wouldn’t have been able to afford to take my grandkids with me, and I mean we had a really great time. At The Academy of Natural Sciences and The Franklin Institute, it’s always a learning experience. We come out for their little workshops when we can attend, and I bring my grandkids. It’s always a learning experience; my grandkids are teaching me some things I’ve forgotten. They give you quality time with your family. Instead of putting the kids in front of the TV with a PlayStation, we’re coming here.

Unlike most PISEC participants, Soynia joined not through a CBO but as a result of a serendipitous conversation at the dentist’s office with a CASE ambassador.

I was being nosy. There was a lady in the dentist’s office and she was on her cell phone, calling people, asking them how many people wanted to go to the Zoo. She was trying to get a head count together, and I said, “Well, I would like to go!” And we exchanged phone numbers, and I came and I met her. She just told me how to sign up for the workshops and put my name on the list and I would get information in the mail, for when they were going to have workshops or we could have passes for the Zoo, and here I am.

Soynia appreciates PISEC’s hands-on workshops, which she feels are a special benefit to her grandchildren.

I like the workshops, ’cause it gives me the chance to do hands-on activities with my grandkids. Of course you know grandparents don’t have as much energy with the kids, so when you come to a workshop, there’s somebody there to help you to help your grandkids do the different activities, and then they get to take some of their projects home with them, and I really enjoy that.

Soynia would highly recommend PISEC programs to her friends as a positive, educational, and low-cost way to spend quality time with family.

[The programs are] educational, exciting, fantastic, great. It’s just an enjoyable program that allows you to spend time with your family, your kids, and your cousins— whoever you want to invite to come out with you for that day and have a great time. . . .

With CASE we’re able to do workshops with the family. It doesn’t just limit you to once a year; it allows you to do these projects throughout the year. So it’s an all-year-long project. It’s not just seasonal.

Soynia says her grandchildren have become far more interested in museums and science since they started coming to PISEC programs. As a result, she and the children go to the museums on a regular basis. She and her family find museum outings rewarding and fun.
You see, I had the kids all week, and the first thing I’m thinking is, “Let’s go to The Franklin Institute!” As many times as you could come to The Franklin Institute, there’s always something that you’ve missed or something you want to see again. As soon as the kids came in here they said, “I want to go to the Heart!” [the giant walkthrough exhibit at The Franklin Institute]. And that’s a learning experience. So the more we come, the more it’s instilled in them [and] the more they remember. Sometimes it’s like, “out of sight, out of mind” with little kids. But, because we come so often, it sticks with them.

My daughter, who’s never on time, manages to get to PISEC programs. I called this morning and said, “Well, make sure you’re going to be there,” and it gave her something to look forward to doing as a whole group, so now you have three generations. You have me, my daughter, and now my granddaughter.

When we did the Mummy Madness workshop, we came down and made the little beetle, out of the clay, and I actually even made one myself; so it makes you feel like a big kid, too. And like I said, it’s not just somebody giving information. The hands-on projects are really great, too.
For Soynia and her family, cost is an issue, and an exciting, educational program that is affordable and fun is a valuable opportunity.

When they finished their hands-on project they were talking about it, saying, “Can we take it home?” They really get more excited than I do. Because I want to be hands-on with their learning and their growing—that makes it really nice and affordable. I keep saying “affordable,” ‘cause when you have more than one kid, it does become expensive.

Because PISEC has given so much to her family, Soynia is glad to volunteer to help out.

Whenever they call me to do a workshop, I will drop whatever I am doing and try and work around my schedule to do the workshop. Some people just want the free passes, but don't want to participate with the surveys or the workshop to keep it going. I’m willing to come down and volunteer an hour a week or two hours; I'm willing to do that.
Christine Day is a daycare provider and teacher-in-training. She began working with CASE in its first year (2003), and has been an active and creative participant ever since. She became a CASE ambassador, representing the African Episcopal Church of St. Thomas. Christine is the mother of three children and ten grandchildren, and her entire family participates in CASE.

Christine has taken the science ambassador model and expanded upon the basic program to benefit her local community.

I'm a “Community Ambassador for Science Exploration.” We learn workshops and we take it back to the community. For myself it’s for underprivileged children who cannot afford to come to the museums. Maybe their parents don’t know anything about it, can’t afford to take them, or how you fit it in the budget as a single parent. So, we just give them a small version of the big stuff that’s going on. In our workshops we actually have newborns right
on up to old age, and it works out because we get to take it to all the different levels. The program is flexible, we don't have to be rigid or have a script, and we can give it to them the way they want it, let them ask questions, and feel free. I think if we give it to them right, they're going to want to come in and get more, and that's what I'm finding. What we did is buy the membership, and we share it, we pass it around. In the school that they attend, I asked the principal to buy a couple of passes, and now the parents share them, so I'm finding it's working for the greater community.

A lot of times we test our workshops out in our daycare program, and then when I do it in front of the big group I've already got it the way I want it. I know what to leave out and what to put in and I've already heard the questions. I've tested, to see if the bubbles work, to see if the thing is supposed to fly, to see if the tree is going to work, can I really make this paper. We're only required to run two workshops after each training, but sometimes we might wind up doing four. Sometimes you need two workshops just to cover the whole subject because the audience wants more, and—not that we're obligated, but I want to give them more because they're asking for it and I don't want to leave anything out.

I remember one of the workshops was about water, and we took the children on a trip on our own to the water plant because we wanted them to see the Philadelphia Water Works and how it works and what it's all about compared to what we said and asked them, “Did you think it was the same or different?”

Another time, we went to the park and we were talking about pollution and what it does to streams and water. And I took them to the clean end in Cobb's Creek to, to show them what it was like, where it was nice and clean, then I took them down to the other end, I said, “Now, what do you think is wrong with this picture?” And they pointed out tires or shopping carts or plastic bags, and I said, “Well, how does that mess up the environment?” And they had great answers. Like fish could die 'cause it choked on the bag, you know, or the tires slowed the stream down. Then when they went back to the community, we had a block cleaning.

For Christine, CASE is a terrific opportunity to connect with young learners, and to see that her work makes a real difference in how children and families discover science together.

Kids learn a lot from CASE workshops. They thought that if they put a triangle straw shape in the water and tried to make a bubble it was going to be a triangle shape, so it was amazing to let them find out that no matter what you put in there, it's always going to be round. They said, “I want a square bubble! Well, I want a triangle bubble!” We must have done that workshop for three hours because I don't care what I said, they just kept going up and down the street, finding all these different shapes, going, “I know what I'm going to do! I got a great idea!” And I don't care what they pulled out; it kept turning out to be a round
bubble. And I thought that was the funniest thing. Because sometimes you can’t teach it; they have to touch it and feel it and do it for themselves. I don’t care how much you stand up there and say the bubble’s going to be round—until they see it themselves, that’s when they get it. And then you know the little thing went off in their head, and they said, “Always going to be round.” And I’m going, “Yeah, you’ve got it!”

That bubble activity took place during my first year, and we weren’t sure how the audience was going to take us. But, that group stayed with us. We’re in our third year, and we still work with that same group of children, so that’s really nice. And I’ve met a lot of new friends because of that. I’ve met their parents, their aunts and uncles, and their cousins. You never know who’s going to drop off, who’s going to pick up, or who’s staying or who’s leaving, so that makes it really nice. When I go to the mall, the movies, or anywhere in the community I see those same children, and they go, “That’s the lady that taught us!” It’s a lot of fun to hear how they know you, and the parents or somebody will come up—maybe they were the aunt—and they’d be like, “Well, how do you know her?” “She’s the lady that made the bubbles,” or “She’s the lady that made the planes fly,” or, you know, that’s really nice. And it doesn’t really matter what I’m wearing or, like how I am, they just accept you for who you are. And then they go, “That’s the museum!” Sometimes they call me “the museum lady,” or “the lady from the Zoo,” so I have all these different titles because of different children recognizing me from different things, and that’s really nice.

To make the entire CASE experience more enticing, Christine dresses in themed clothes and creates a party atmosphere.

When we run workshops, we’re dressed up with the theme. And it makes it a little more exciting; it brings the whole thing together. The first thing we always say is our name, then we tell them what CASE is, and why we’re there, and then I’ll say, “We’re going to have a party,” and I’ll go around and say, “Has everybody been to a party before? And what is a party all about? Okay, now we’re going to have a paper party, and I’m going to show you how it’s done, and then you tell me what you want to do at the end and then we’ll do that if we have enough time.” So they like it, because—who doesn’t want to go to a party? Parents like it because it allows them to come and be with their children, sit back and relax. They can take that mommy hat off for a minute, and just have fun with their children; they don’t have to be so stressed. So, it’s not like going to school and learning homework—it’s a whole lot different than that. You’re learning, but it’s a lot of fun. And we leave it open for talk; it’s not like we’re saying, “Shh! Be quiet!” You want to ask a question in the middle, we just stop and give them time. Some of them take a little longer to get their words together, get their thoughts together, but there’s always somebody else in the crowd who says, “Oh, I know what they mean!”

CASE is also an opportunity for Christine to build her own skills, knowledge, and contacts as a professional teacher.
Teaching is my profession, and this is just one more thing to get out there and practice your skills, and give the children what they need, and it helps me in my business, and it helps me in the social field. It’s just something that you can just carry with you all the time. I’ve learned a lot of things that I didn’t know; you know things that you think you know. I’m in college and I still learn things from CASE, and that’s really nice. It makes me want to investigate and learn more. I think if I ever go into the field of [elementary school] teaching, or leave family daycare, I will be ready, that’s for sure.

One of the classes we just took through CASE was about fundraising and how you can get the children involved. A lot of the ideas that we learned in CASE I would like to put into action—maybe get a funder to give me money to expand, and get a bigger kit with more supplies in it, take all the stuff I learned at the Zoo, and go out places, and then just give it away to the community and say, “Look, I’m going to teach this lesson. Then when I’m done you’re going to be able to take this whole thing with you and then take it back to your school or wherever you are and share it with other people.”
In my community, families don't have the money to do for themselves. That’s why CASE is so important. When we show up, they always know it’s going to be a party, ’cause they know we’re going to have fun, we’re going to enjoy ourselves. And then we’re going to laugh and talk about what we did, and they get a chance to chitchat with each other. I can say, “What did you like the best about this particular workshop?” And you always get enthusiastic answers. You don’t get the “Mmm hmm, I’m not sure”— everybody’s talking to me at the same time. That says that it was a success and everybody had something from it, from the parents to the children. Some children have to do projects in school, and they’ll ask for the materials to do a CASE project. And we just show them and put it in a plastic bag and let them take it to school.

Christine has some specific ideas for helping her community to engage more fully with PISEC museums.

I would like to see the bus come into the community to pick the children up, maybe once or twice a year, and take them to the museum, versus them trying to get there on their own. Believe it or not, a lot of parents can’t afford the transportation cost as well as the admission cost, and it just would be a little extra something to look forward to. I would like to see them have the whole behind-the-scenes tour. And then . . . I would like to have more time, and a permanent space where I could do the workshops. I think if we had a permanent place where we could come, I would bring the children down and say, “Come on! I’m going to show you the real thing. I mean, I did a small part, but let me show you the real thing.” And I know they would like something like that.

Before PISEC, neither Christine nor her family took part in science-related activities. Now, science is central to their lives.

If we’d do anything it was watch home movies, or we’d go out to the movies or to one another’s houses. My kids are 26, 28, and 30, and honestly, of the four museums, we went to the Zoo. I don’t even know if the Aquarium was there when they were little, but The Franklin Institute, the Academy—other than a school trip, I don’t think I ever took them on my own. I really don’t remember that; I really don’t. So, for me, it was a pleasure to come inside and see it. It was like, — “Wow! This is what goes on in here!”

Now, my daughter bought a membership to the Zoo that she shares; one goes to the Aquarium once a month. I [don’t] want my grandchildren to come away thinking that it’s closed doors. It’s open to everybody, you know, and the more they see it, the more they’re going to like it, the more they want to go, and then when they see the signs change on the outside, even if you don’t read the paper, you know what’s going on on the inside. If you go by enough, something’s going to catch your eye.
What makes CASE special, Christine feels, is its focus on community. Instead of simply teaching science, it helps families to feel as though they are part of a “family” of people who care about learning together. CASE expands their idea of community.

We serve food, and the children get to socialize with other groups of children that aren’t from their school or from the immediate block that they live on. They might be children that live across town. When they arrive, they’ll ask, “Is Johnny going to be there?” Is Susie going to be there?” You know, when you hear that kind of a conversation, you know they’re not only anticipating the workshop—they’re anticipating their friends at the event; they want to see them again. New families are coming together that would not have met if it wasn’t for CASE. So that’s really nice.

Or, my granddaughter will come in, and she’ll say, “Ab, I went to the park today, and remember, at the Zoo workshop? I saw that girl again!” So, it’s the little things like that, they’re excited when they connect. To me that’s important because a lot of children aren’t social because the parents tend to hold back. Everybody’s worried about violence and children being hurt. They take those barriers down when they get a smile on their face and say “Oh, now I do remember her. My daughter’s right; she was at the workshop. I didn’t remember, but she reminded me.”
Loretta Ferguson has been an active participant in PISEC programs for over ten years. She spends many hours at St. Thomas Church working on youth programs and has helped with PISEC as well. She attends events with her grown children, her grandchildren, and even her great grandchildren. Her son George became an ambassador in CASE.

TAKEAWAY MESSAGE FROM LORETTA FERGUSON:

When we first got started with PISEC, we were able to invite our congregation and our neighbors, and it went off really, really well. Everyone enjoyed it, and many of the people are continuing to be part of the program. I think many people have also gotten memberships to the various institutions that we are working with. I enjoy it because it gives young people a reason to come and get involved with science rather than other things. They enjoy it when they get here, although when you say to them, “We’re going to a museum,” they go, “What about a museum, why?” But, then when they get here, they really have a good time; they enjoy it. So, I really like working with the organization and the people.

The Ferguson Family became involved with PISEC through their church. Loretta Ferguson believes that the lack of cost to the programs provides an initial reason to come. Once families arrive, they discover a world of opportunities available to people who wouldn’t otherwise consider science to be interesting, or a museum to be a worthwhile destination.
I’ve been working in my church over 40 years, and I’ve been working with young people in the youth groups. So when this opportunity arose, I think I was just glad to have something to offer the young people in our church and community, so I just sort of evolved into it.

I like that we can introduce this to families who ordinarily would not take advantage of these opportunities because of price. But, once they get here, then they understand the meaning of it and then they have a good opportunity to get memberships and to continue with their children.

I think this is . . . a great program. Because not too many people are able to have this advantage of being able to come some place this important and at least get the feeling of how it is. Then introduce your children to doing something different, other than Chuck E. Cheese and things like that. I just love the program; I think it’s wonderful; and I enjoy trying to instigate [sic] young people and their parents. And that’s the big thing about it, is that we involve the parents. Parents always want to just send their children, but this program indicates that you need to come with your children, and that’s important to me.

The Fergusons had no science background before getting involved with PISEC programs. Now, three generations of family members have discovered science as an area of real interest. Loretta’s son is even considering a degree in science.

My daughter, she’s a travel agent. My son, he’s working with many things. But, in the last five years, PISEC gave him the opportunity to become a [CASE] ambassador, and he really enjoys doing that. So although he doesn’t have a career-oriented job, he is really interested in this, and hopefully he might decide to go back to school and really get involved and get his degree. . . . I think that if he went back to school, then he would take the science courses. I believe that if he gets the opportunity to go back to school, this would be something that he would like to pursue.

It’s just a wonderful opportunity for families. They should take advantage of the gift of going and being able to see all of these institutions. This will inspire somebody to go forward into the field or think more about science, which is a good thing.

Loretta’s enthusiasm for science spreads outside of the immediate family to extended family, friends, and neighbors. Because of PISEC, Loretta and her friends now think in terms of hands-on family science learning.

With my great-grandchildren and some of my neighbors’ children, we do talk about science, and they get excited when we start talking about it. I have to sort of lead them into it, but then it encourages them to remember what they’re learning in school. So, it does help. But, the parents I know have to sort of lead them into it to get them excited about what they’ve seen. They love the Heart! [The giant walkthrough exhibit at The Franklin Institute].

When my children were coming along, we always did visit museums and things in the Philadelphia area, because we didn’t have as many distractions at that time. So, this was
really a good outlet for them. They’ve been all over Philadelphia and all of the science [museums]. PISEC really helped to get them involved.

Surprisingly enough, the young people do have a nice time when they come here, because you have various things for them. But, I’m not sure that that would take the place of Chuck E. Cheese or the park. But they do enjoy, I think, the way you have the program running now where you have little things for kids to do when they come in. It makes them not want to say, “Oh, I don’t want to go there.” There was a time when my children were coming along, they had already seen these things a couple times, and they’d say, “Oh, I’ve already been. I don’t want to go back anymore,” and they would rather go someplace else. But, I think, after PISEC came along, the young people don’t resist it as much, because they’re having fun as well.

The Fergusons continue to spread the word about community-based science programs. Perhaps more importantly, they also continue to think about and explore science as a family outside the context of PISEC programs and events. The experiences that PISEC offers are a catalyst for visits to other museums, for improved school performance, and for a new perspective on science as a possible career direction.

Usually we do try to…come out with our neighbors and our friends and their children. My cousins who went [to PISEC events], they do ask me about it, you know they say “When is the next one; when’s the next one?” Because I work with the group, we try to follow up with people in the group to find out what’s going on, or to find out how they like things. That’s part of our program as far as our church is concerned. As far as the people who come, I don’t make it an effort to follow up on it, but when I see them or I talk to them, they always say how much they’ve enjoyed it. They really do enjoy it.

The kids tell each other [about PISEC], and then they try and out-do each other. “I went to the airplane,” “Well I went to this one”—you know, “I did that.”

I have something that I can sort of encourage my grandkids into pursuing and to make them understand why they have to go to school, why they have to study, do their work. I’m hoping that their parents would do the same thing. My granddaughter went to Pittsburgh. She lives in Pittsburgh with her children, and they do visit the museums there. They do go to cultural activities and things there. So the young people are used to going places like that.

One of my grandchildren may take science courses. He’s not sure what he wants to be. He’s only 12, but he’s doing well in school. They’re all involved with basketball now, because they’re all tall. They’re all big, and tall, and all they want to do is play basketball. So, my thing is, I’m encouraging them to channel their education experience into something specific. So I do try to tell them about the sciences, but right now it just goes in [one ear] and out [the other] because all they want to do is play basketball. And I said, “Well, you know, basketball may not materialize. Then what are you going to do?” [Laughs] They don’t have an answer
yet. But then, my young people are sort of young. I think the oldest is about twelve, and the youngest is about seven. So they’re just going through what they may want to do.

My granddaughter, she’s encouraging her daughter, who’s seven. She’s very instrumental in her activities. . . . She comes to all the PISEC stuff. . . . she comes to all the CASE meetings that they have and exhibits and things and she loves it, so she’s getting that experience. She’s the only one I have that’s here [in Philadelphia].

Loretta and her husband, both seniors, have discovered a new interest in science for themselves. They have found that science-focused television programs are now intriguing to them, and they work hard to share their interest with younger family members. She feels that teens, in particular, can gain a great deal through exposure to PISEC and other science-related activities.

Oh yes, my husband and I watch Channel 12 and 23 [the local PBS stations]; we watch all of those programs. When my grandchildren are there, we try and encourage them to watch it, too. They like things like maybe about the fish, or the insects, or something like that; they don’t like the other things—some of the other things are too boring. But we try and encourage them when they’re here, to watch Channel 12 or 23, rather than watching all that other stuff. It’s terrible. We try and encourage them, but it’s hard today, we have too many distractions.

I just really enjoy the program. I’d like to continue to inspire the families who get involved in it with their young people. And it’s good. They have to have this kind of distraction from the other things that are out there. So, that’s why I work with it; hopefully, it will be continued, because we really do need this type of activity for our young people. And some of our old people like it, too. [Laughs] 🧀
Anita Franks has been an active member of PISEC since she and her children began participating in Families Exploring Science Together (FEST). Soon after, she became the PISEC representative for the Imani Education Circle Charter School, a PISEC CBO partner. Later, as the leader of the Falomi Club of Campfire USA, Anita brought her group to PISEC events, both workshops and larger events. She later became a science ambassador and then a mentor in the CASE program, and continues to be an active PISEC participant.

**TAKEAWAY MESSAGE FROM ANITA FRANKS:**

The neat part about PISEC is that you have the opportunity to have people from your neighborhood to come out to you and do these hands-on science workshops. When you get a chance to get your hands dirty, you can sometimes have the experience of feeling things or seeing things or smelling things that are different and really understanding the science around you. You have a chance to do all of this good fun stuff with your children. So while you’re learning, they’re learning and having school, while having fun. Sometimes you get a chance to go to the museums just for fun or for an event and workshops.

Anita Franks and her family began their PISEC activity, starting with Project Pigeon Watch from the Cornell Laboratory of Ornithology. They also took part in an Egyptian Mummy event.

We did workshops at the Aquarium, the Zoo, The Franklin Institute, and The Academy of Natural Sciences—all four museums. We went to those events and then we did the projects. . . . One we did with The Academy of Natural Sciences was an event with the pharaohs from
Intrigued by her experiences in previous PISEC programs, Anita became a CASE ambassador, representing the Campfire CBO.

I was sitting in a meeting and I said, “Hmm. This looks like a good fit for Campfire.” I always knew that anyway, because the PISEC programs involve families. I enjoy science, and I like passing information on to a child. I thought it would be a good fit for me and my families.

[Ambassadors need] patience, flexibility, commitment, time, and dedication. Even if you know things, you share the opportunity. Every time we go into a training session, we learn something that we never knew.

I never had a full understanding of rocks, and I knew that. [Then PISEC] taught me how to present the “Rock around the Clock” workshop, having all three rocks in my hand and talking about those rocks and examining them with a magnifying glass and then going through that whole process. No one had ever explained that there were just three different kinds of rocks, period. . . . I feel more comfortable in saying, “I know that.” And I can tell you that, if a rock hits a certain [temperature], it’s going to . . . melt and that this is going
to happen to it, and it’s going to become this. And it was like a “wow” moment for me . . . all of us just about had the same experience.

For Anita, the experience of being a CASE ambassador was transformative. Not only did she gain a better knowledge of the science behind the workshops, but she also gained a new understanding of the purpose of museums and the work of museum professionals.

One of the skills is being able to learn more information and being able to pass that information on. The other is being a resource person. I didn’t know that there were live animals in museums, and I’ve seen behind the scenes. These are more things that will help children to open up to adults, and I’m able to pass that information on to students and even their parents. [I tell them,] “You like to do that, so maybe think about going into this field, or that field, or the other.” . . . [I’ve become a] resource person; I can open up the museums for them and the world for that matter . . . It’s keeping me fresh [and] . . . I’m able to stay on top of what’s going on. You know, we’ve had a chance to meet Jane Goodall and other scientists through this.

Anita also found that PISEC programs were changing the way children and parents viewed one another. By working together toward concrete goals, family members had a chance to think of themselves as a team and to think of one another as valued team members.

Looking at families, seeing them discover one another for the first time and the respect children all of a sudden have in that “aha” moment: “Oh, my mother’s not a dummy, my father’s not a dummy, or my big brother—Oh, he does know something; and even the little person—she does have some information, and they can do it, and I need to be able to let them do it,” that kind of “aha.”

A third-grade group involved with FEST had gone to the Aquarium, and the [workshop leader] had done a thing around polar bears and the Arctic and the Antarctic, and they made dioramas. The teacher said they could take the dioramas to be displayed at an event at The Academy of Natural Sciences and the parents were so proud. The dioramas were really neat. The children were standing up there talking about various things that were going on in the dioramas, and the parents were standing up there talking. It was just like, “Oh wow—we got it going on!” and they were giving high fives and it was a neat thing to watch. In that very moment there was a father there, and he looked down at his son and he said, “Wow!” And that’s it; it was just a wild moment to see that!

Kala, Anita’s daughter, also gained a great deal from the PISEC programs. Over the years, she went from being a young participant to taking a serious leadership role. Not only did the experience build her science knowledge, but it also provided her with role models and confidants who could help her think through her career goals.
Once we became part of FEST we were able to really go to the museums more and to be involved with scientists and to be involved with those who work at those places and to be able to sit and talk with them . . . at a different level. We’ve had that level of opportunity to go to the museums more often and have a diversity of museums in one year. [PISEC] helped her really solidify the field she really wanted to go into, and that is very good, because being a veterinarian is very serious business and it’s hard . . . getting into the field; it’s hard studying. Is this really what she wants to do, because of the time and money involved. And I was able to put her out there to see whether she was going to really hang with this, whether this is really what she wanted. Playing with dogs and cats got her thinking this is what she’s into. She went to [PISEC staff], and that helped her even more.

An enjoyable memory was just going to the workshops and working with [my daughter] as an ambassador. She was working with me, versus for me, so that that changed the dynamics of our relationship. It was a good thing, because each time she [presented a program], I knew she knew her stuff.

Overall, Anita sees PISEC programs as being all about family. And that, she says, makes it a tremendously valuable resource, both for her family and for many others.

They always keep, at their focal point, parents and families. It’s often easier for organizations to run programs when the children are there, and not necessarily parents, but PISEC itself has never [done that], because that could actually pull the program apart. But it’s always been families, and I think as a group we really see the importance of family and family involvement.

It’s been fun, it’s been a good project and a good ride and I hope we continue, because as far as science programs are concerned . . . you don’t think you’re making any headway, but you see little bit by little bit that you really are.
When Damaso Gallman started as a CASE ambassador with the Norris Square Neighborhood Project, he was only fourteen years old. While his family never got involved with the program, he persevered and became an exciting, engaging presenter. Damaso is now at Philadelphia Community College and working with the city’s prestigious Mural Arts Program.

**TAKEAWAY MESSAGE FROM DAMASO GALLMAN:**

First I was weird. I didn’t know what I was doing. After awhile I started presenting, and people started seeing me open up. Basically I learned how to befriend people, teach people.

Damaso Gallman joined CASE as a science ambassador to fill time over summer vacation when he was 14 years old, but found that the experience offered much more than he had anticipated.

A random person from my old job told me about this program, and ’cause I had nothing to do this summer, I joined, and I kind of liked it. I like the workshops, the atmosphere. I liked the kids and the teaching . . . I just like being in front of a crowd.

If I were to describe the program to friends, I’d say, “Basically, use the opportunity to teach, to fill the teacher’s shoes.” But there’s more to it. There are the different environments you’re in, different museums. I go because some of the stuff you learn here, you already learned in high school, so basically, you can change to be a little smarter than the teacher!
Damaso has stayed involved with CASE despite the fact that his family is not involved in the program.

In my family, I have my brother and my mother. They don’t participate; they are always busy. I only see them at nighttime, when we’re at the house. My brother’s interested in culinary arts—he’s into cooking, and my mother, she’s more of the job person; she’s working at the naval base. My mom keeps saying, “Do what you got to do.” So I keep myself occupied.

Damaso has used his own creative ideas to make CASE activities fun for families and to ensure that kids and adults alike learn from his presentations. His innovations have brought in new families and kept regulars coming back for more.

I give little quizzes at the end to make sure they’re paying attention. And sometimes I make up my own workshop, my own activity. Like at the end of the bubble-making activity, I got them in groups and challenged them to see who made the biggest bubble. That’s my time to come up with ideas.

One of the workshops was mostly about facts, so I switched things around a bit to make it more like an activity. The workshops that were hands-on activities were very successful because the participants learned a lot. Some people became curious about the subject and wanted to know more. And new people came because of the activities we were doing.

Damaso enjoyed creating opportunities for people to discover something new about science. The key, he found, was in making science accessible, exciting, and relevant.

I enjoyed presenting activities that amaze the kids. They’ll second-guess themselves and be like, ‘Oh, I was right or wrong’. Or, like, ‘I learned something new.’ I liked presenting the dinosaur workshop at The Academy of Natural Sciences, but instead of just presenting facts, I kind of switched it around because I knew they were bored. I asked them, what is an archaeologist, and entomologist; changed things around to make it more interesting.

In addition to building a better understanding of science, Damaso gained new skills and confidence in his abilities as a presenter and leader.

To be a good ambassador, you need to collect your resources, be comfortable, be relaxing a little bit, twisting something around, and friendly. Entertain them for a couple of minutes.

You also need organization and also research. Because some of the stuff they do give you, when you do use it, you find you need to make it more interesting. And you never know what question they might get you with. So you need to know where to find teaching resources.
When he started with PISEC, Damaso did not know what to expect. Now, though, he feels that the program has had a positive impact on him—and he would recommend it to peers.

I didn’t really have any expectations. But whatever came with it, I was like, ‘I got it.’ I found I enjoyed teaching, really, because I understand what it takes to make a lesson and all of that. You have to do all that process—it’s a lot. Like, kids at certain levels, how you have to put in certain new words, and stuff like that.

PISEC is a great program. I would recommend it to somebody to do this, especially fourteen-year-olds, fifteen, sixteen. It’s an after school program, and at a young age it’s great to get to a new atmosphere, start to get stuff. And it’s good to start earlier than later. So you understand what you all need.
Kim Johnson joined the PISEC program during FEST as part of the Imani Education Circle Charter School, and later became an ambassador for the Campfire Program. When Kim began her involvement with the program, she was a certified teacher working with second graders. A growing interest in science, nurtured through PISEC, led her to additional certification in middle-school science, and she is now teaching science to grades K–8.

For Kim, PISEC is a family affair. Her husband also became a CASE ambassador, and they enjoy giving workshops together. Says Kim:

Watching us present workshops together gave participating families a different experience, seeing a husband-and-wife team, from the community doing science with them. Our interactions sometimes, [laughing] had comical moments. They got to see the interplay between our personalities.

Kim’s children include a 24-year-old daughter, who helped out with the workshops until she went away to college and graduate school. Three younger sons, aged 23, 16, and 13, have all been involved with PISEC from an early age. Kim says:

My two youngest sons have both decided when they graduate from high school to pursue science careers. One of them wants to be a doctor and the other wants to be chemist.

Kim believes the PISEC program played a role in her children’s decision-making process.
TAKEAWAY MESSAGE FROM KIM JOHNSON:

*My children have always liked science, but now the museums have become like second homes to them. They know their way around the museums. They're comfortable with the museums. They've even asked me if they can go to museums with their buddies.*

Kim and her family began attending a few *FEST* events toward the end of the program, at the invitation of another active *PISEC* participant. The *FEST* experience intrigued the Johnsons, and they decided to take a more active role in the *PISEC* process. When the opportunity arose, both Kim and her husband became *CASE* ambassadors.

*I became a CASE ambassador because of my love of science and because this was an opportunity to expose families to science in a different way. You need to love people and children. You need to have a sense of humor and be a good student, because in order to present the workshops, you have to be a student to first learn the workshops. When I said, “Be a good student,” I don’t mean a good student in the sense of really good with books. I mean be willing to learn and really absorb the things that you’re going to be sharing when you present the workshops.*

*I have always been confident and comfortable in front of groups and in front of crowds, but I think my level of confidence and comfort has changed or evolved. I think I actually make the individuals that I am working with also feel comfortable.*

Kim’s involvement with *PISEC* programs gave her the confidence and skills she needed to work toward certification as a middle-school science teacher.

*Since I became a CASE ambassador, I am now a full-time science teacher at Khepra Charter School, and I recently passed my state exam to be certified to teach middle-school science. I definitely think, along with the study that I have done on my own, that my experiences and my exposure through the CASE program helped me in passing that exam.*

*I guess for the average person, they would have needed to take some courses, but taking courses on my own, and again, being involved with the CASE program and learning in-depth science on about 32 topics—now, that’s a large background in science.*

*Leading the CASE workshops is different from working in the classroom. In a classroom, most of our instruction, even in the lab is test-driven. You know, you only have a certain amount of time to cover a certain amount of material over the course of a school year. With the CASE workshops it’s really hands-on, so the learning is fun as opposed to passing a test. And the structure of the workshops—it’s just really different. They address all age levels, because we don’t know if we are going to have toddlers; we don’t know if we are going to have grandparents. So we have to cover the whole scope.*
I've used some of the techniques I learned from CASE in the classroom. And I've used the creativity that I have been exposed to from CASE workshops to help to shape my lessons for those students that learn in different ways. Some of our students are more kinesthetic or hands-on learners, and some of them just need other ways of learning and the CASE workshops provide that, more than your traditional classroom lessons would. So I definitely draw from the CASE workshops.

An unexpected outcome of Kim’s involvement in CASE was her own children’s newfound excitement about science and science museums. She also found that she became a science learning ambassador outside of PISEC.

I’ve made many connections with families. Families come and ask me about things that don’t necessarily have anything to do with CASE or don’t necessarily have anything to do with my capacity for instructing their children. But they feel comfortable. We’ve developed a rapport and they feel comfortable with coming to me to ask me things or to seek information that they may not feel comfortable asking anyone else in the school. I got much more than I expected from working with CASE.

For Kim, one of PISEC’s most appealing attributes is its lack of cost. There is no charge for families to take part. As a result, she has personally seen many African American families choose to attend PISEC events and, by so doing, discover the excitement of science.
The parents and the children would be so excited to get to go to the museums, because a lot of the families that I work with are what would be considered Title 1, or low-income families. And it's just not in their budget to go to museums—you know they can't afford the admission fee. And then you're talking about multiple children—you know it makes it really hard. So, to see them out at the museums—I really enjoy that. The parents and the families often let me know that they really enjoy the multi-pass.¹

Our own family probably got the most out of visiting the Aquarium. I think that the first time that we went to the Aquarium was probably an “ooh, ahh” moment for our family. I think when we saw the large tank that had the divers in it was the best moment for us. I had one girl and three boys, and I think my boys really, really got a kick out of that. And whenever we got ready to go to the museums early on, they were always like, “Aw, do we have to go?” but once we would get involved in the activity, then their tone would change.

Kim believes that the design of CASE workshops, combined with community-based ambassadors, encourages family learning. She is also impressed by the real-world relevance of many PISEC activities. Over time, she says, attendees begin to feel a sense of ownership and connection when they come to the science museums.

I like the fact that the workshops are geared towards science as fun. They cover the entire age spectrum, so if you have toddlers, there are things for toddlers to do; if you have your seniors and grandparents, there are also activities for them to do. I like the fact that we bring them to the community. The community doesn't have to go somewhere outside of the community for the workshops. You know, they're in their school or in their recreation center or in their church, somewhere where they're comfortable and somewhere where they feel ownership. I think it helps because it keeps them in their comfort zone. And they feel like they're coming into their homes as opposed to them going somewhere foreign that they're not familiar with.

Community ambassadors—these are folks directly out of the community . . . out of your local organization, someone that you can see walking down the street or in the supermarket or in the laundromat. Ambassadors . . . are the liaison between the science world and the community. And science exploration [is] taking science out of that framework of just being something in the textbook, or something in the classroom, or even being something on TV, [to] being something that you can apply to your everyday life. One of the things about the CASE workshops: every workshop had some type of application that you could see in your real life. There was something that tied it into something that you could relate to.

When we did Kitchen Chemistry, families enjoyed the fact that when you bake a cake, you're dealing with chemistry. Of course, they loved the closing part when we put the Mentos in the soda, you know, and the children, the adults—everyone—got to see the reaction. We worked with vinegar and baking soda, and we worked with lemon juice and baking soda . . . these are things that are in your household every day . . . you could repeat this

¹ The multi-pass is good for up to 6 people to visit any of the four PISEC museums. Each community organization receives two multi-passes per month that families can borrow.
demonstration at home. And most folks have done baking soda and vinegar, but to feel that one of the mixtures gets cold and the other one gets hot, it’s taking it a little bit further, but it’s not something that you have to be in a laboratory to experience.

Kim’s children, exposed to family-based informal science learning on a regular basis, have expanded upon that interest. One attended a science camp; another won a top prize at a science fair.

One of my sons went to archaeology camp at the University of Pennsylvania. The same son went to a summer camp at the Aquarium, and this summer he went to an architecture camp. So, he’s been doing science every summer.

Even the son that is the business major, he actually won first place in a science fair. He built a model soundproof room and tested it with different materials to see which was the best soundproofing. And he actually won first place. I have noticed their interest in science has picked up. My youngest son actually told me that, on one of the state tests, he believes he did so well because of things that he learned in the CASE workshops.

Kim explains that the African American community tends not to think of museums as destinations. Through PISEC programs, however, many African American families she knows have started to think of museums for fun as much as for learning.

Even though I love science, my involvement with the museums may have been once, maybe twice a year going to visit a museum. And the museum world, really, in the African American community is not something that we really utilize. We really don’t take advantage of museums, and the other cultural things that are here in Philadelphia.

It’s not that I feel that the museums are an aloof group. I think it’s more of a cultural thing, that in the African American community, to most of us, visiting a museum is something you do in school, on a class trip. It’s usually not a part of family activities or family outings, with the exception of the Zoo. I think most of the African American community does frequent the Zoo, but the other museums, we don’t really think of them as something that would hold any interest for us.

[PISEC] has made a difference in other families, and I think it has opened up the doors to other museums also. I didn’t used to go to The Franklin Institute, and I didn’t visit the Aquarium before, and I’ve visited those places and oh, they’re wonderful places. Well, how about trying out the Art Museum, or the Atwater Kent Museum, or let’s go visit the Liberty Bell. We’ve done all those things, and so have many other families we met through PISEC.

Now, every time I hear about some type of science activity, if I’m able to get to it, I get to it. I am taking four sixth-grade girls, this Saturday, to the Women Chemists Conference at Chestnut Hill College. This is for sixth-grade girls only. I’m constantly searching the Internet for what type of activities and events are out there, and just to learn more about science interactions that I don’t already know about.
Trinia Jones is a mother of four boys. Her ethnically mixed family attended PISEC events as a group, both parents and their four sons.

**TAKEAWAY MESSAGE FROM TRINIA JONES:**

Before PISEC, we went to the playground and the park a lot. We played baseball, that kind of thing. And as far as science is concerned, beyond watching Discovery, we didn’t do a lot of science-oriented activities.

After we got involved with PISEC, we went hiking more often. One day we were all in my son’s bedroom window watching lightning, because we had this great view of the city, and they were talking about facts that they learned about lightning at The Franklin Institute. I noticed when we went to the library, they would want books that were more specific—books that specifically dealt with one subject, like maybe a certain type of frog, as opposed to just frogs.

Prior to PISEC, Trinia saw no reason to buy expensive tickets to a museum in hopes that her children might enjoy the experience. PISEC not only piqued the family’s interest in science, but also introduced Trinia to the idea that one can buy a membership and enjoy free admission for an entire year.
The thing that I liked about it the most is it encouraged my husband and I to buy passes for our family every year, which we've done every year since. We'd choose one of the museums and we'd buy a membership for our family. And it encouraged us to do that because we always have fun at the different events. So we figured, “Okay, we can do this as a family.” So that's one of the things that I remember most about it.

The museums were expensive. We have a large family; we have four sons, so that makes six of us. And you know, all of the [PISEC] events are free, so that was a big boost. And once we started participating, it was just fun and interesting.

For Trinia, it came as a happy surprise that the staff of a free program could be pleasant, welcoming, and attentive.

I like that the programs are free. I like that the people involved with the programs are very helpful and kind. Like the one lady who I email at The Franklin Institute—she always gets right back to me. I really appreciate that. Sometimes when things are free, people treat you like you owe them something. But, I never get that attitude or that feeling from any of the people who are participating in these events.

The program is designed to encourage families to learn about science and to have fun while doing it. And the programs offer various activities that are not only fun but also educational. The last one we went to at the Aquarium, about sharks, was really interesting.

While Trinia herself was not particularly interested in science, her sons had showed an interest. PISEC allowed her to support her boys’ science interests and even expand upon them.

I've found that my children—since we have all boys—they just love science, and I was never really interested in science in school. My oldest son, who's now 20—he really loved dinosaurs. So his interest was in dinosaurs, and then my next son, he was more interested in nature, like trees and plants and that kind of thing. So having the two boys with different interests in different aspects of science, one might want to go to The Franklin Institute and the other might want to go to the Natural Sciences museum. So, it would be difficult because we couldn’t go to both. And this program, and my children's interest in it, opened up a whole door for me. And you know, it's been enriching; it's been fulfilling. It's really been great.

Once Trinia and her children got involved with PISEC programs, their awareness and interest in the natural world expanded. Soon, her children were applying information from museums to real-world settings.

When we went to West Virginia to visit my father-in-law, they would always point out things that they remembered, like, “Remember when the lady from the Academy of Natural
Sciences told us about butterflies? The butterflies do this, or do that,” and they would always teach me or remind me of something that they learned.

As a result of their involvement in PISEC, Trinia and her family discovered that science exploration could be as much fun as the movies and far more meaningful.

You might go to the movies together. You might go to a theme park together, which, in all reality, isn’t educational. It’s not something that you keep with you; you know it’s just a memory. But, when we go to the museums, they learn things that they can apply somewhere in their lives, whether it’s in school or whether it’s something at home. So I think the educational part of it makes it . . . different.

We’d talk about the subject we were planning to explore before we arrived. For instance, before we went to the last event about sharks, we talked about it. And one of my sons, who loves sharks, was telling me some things he knew.
Well, when we went, my husband was away in Washington on a trip, so afterwards, the two boys who went with us, they couldn’t wait till my husband came home and they shared everything. And they brought these packets home, different little activities like “Make a Shark Tooth Necklace,” and all of these facts, and they shared all that with my husband.

People are extremely excited in my house after an event, and they want to know, “When are we going back? When are we going to go again?”

Without PISEC, Trinia and her family would never have thought to visit a museum. Now, the family buys memberships each year, and brings along friends when they visit. They have also begun to take part in science learning opportunities outside of PISEC.

The educational aspect has been fabulous—the opportunity to go to the various different places more frequently than we could have afforded to go on our own. The encouragement that it gave us to choose one place and get a yearly membership was fabulous because my children now look forward to these things, and they tell their friends about it, so now I have friends that want to go. I think that had we not been involved in this program, I can’t see us ever having even thought to get a membership to the Natural Sciences Museum. You know, maybe of course the Zoo, but not The Franklin Institute, because in your mind you think, [once] you’ve seen one thing you’ve seen it, but the exhibits are consistently changing. But, I don’t think that I would have even done that if we had not gone to this program.

My sons have participated in a library-based program called Science in the Summer. They went to the Delaware County Science Fair, and my son made a project and it was in the fair.

When my husband and I went away, just the two of us, to Niagara Falls, we actually went to the Aquarium there. And that would not be something we would have done in the past, because as an adult, I’m thinking, “Why would I want to go to that aquarium?”

When we go away with the children, we can use our reciprocal membership. And my children have gone to the museums in Washington various times because of their love for science.
George began his involvement with PISEC programs during the FEST project. Encouraged by family and staff members, he took increasing leadership, finally serving as a CASE ambassador. George, his mother, and his daughter have all grown through PISEC. Today, George is continuing in a leadership role with CLUES and his daughter anticipates studying science in school.

Years ago, at his mother’s suggestion, George began dropping in on an occasional PISEC event. Over time, both his interest and his commitment grew. George’s daughter, Erica, has become very engaged in science through PISEC, and her grades in science have improved dramatically.

**George PARRIS**

**TAKEAWAY MESSAGE FROM GEORGE PARRIS:**

*Erica, my daughter, she was doing average, or maybe a little bit less than average, in science. Now, for the last two years, she has straight A’s in science. And then she goes, “Daddy, I could be a scientist!”*

George’s interest in PISEC started with a tentative involvement in FEST.

*I went to a few FEST events. Not as many as with CASE, but I went to a few, and that’s what piqued my interest.*

*There are a lot of things you can learn, that your family can learn. I didn’t think I was going to stay that long. It is fun. It is fun, I love what I do, and it helped my family so much.*

*So, it really helped my family out a lot and got us closer to going places and doing activities, going to museums. Our interests are just different now. And Erica—when it rains, she wants to know where the water goes, how the evaporation process [works]. And they like to tell their girlfriends. Sometimes they come and play and I hear her explaining things to the kids.*
It’s just the experience of seeing my kids who had no interest when I was talking. She’d be whining and everything was just her. It’s a whole change . . . I’m just watching it develop. She needs this, and I’m so glad that somebody sponsored this. Keep this going.

Her grades have improved, and now she’s looking with me at National Geographic on TV. The television is programmed for the Discovery Channel. This is every day. We sometimes do the Aviation [activity] where we have to make the planes fly. In the bathtub, we do the sink and float.

She’s just so interested now. She’s curious. She’s so curious about things. And my wife Kim! Kim didn’t want to go in the water. I wanted to take a cruise, or my wife did, [but] she was scared of water.

Ever since we did the sink and float activities, and then went to the museum, she said these ships are pretty much safe—I mean the buoyancy. She’s ready to go on a cruise now. She feels as though it’s not just going to sink in that big water.

It was George’s mom, Loretta Ferguson, who introduced George and her grandchildren to PISEC.

My mom took us to a couple events. I remember going to The Franklin Institute. There was the camaraderie of the group that made me think, “These people seem like fun. They’re not stuck up. Even though they know things, they’re real friendly. This might be something I can get into.” And I was just thinking . . . about me. I didn’t know it would affect my family like it has.

Some of our best experiences were the sink and float workshop and the flying workshop. That was fun—especially the part where we had to get the balloons on a rope.

We learned how to increase the velocity of the balloon. It was another way of doing it without using gas. It was fun for me personally. And it was definitely fun for me to watch the kids making the plane, and to see whose plane can go the furthest. It was a competition. People would just make an extra crease in their paper, just to see if it would fly. It was just the dynamics. They had learned from their workshop. I didn’t know what I was doing when I made them before. I just was copying from people. I didn’t know the facts of it. The wing needed this in the back, the flap! All these parts of the plane were important. Well, when I did it at the . . . The Franklin Institute, it made my plane fly further. And I thought, “That’s the reason why we have to make a flap, so that the air can just flow smoothly.”

For George, watching his daughter Erica blossom was especially rewarding.

Just watching her wanting to learn, and wanting to compete, even [with] the older kids. Trying to answer questions, she’s volunteering to do things and then coming home and doing it.
PISEC has been a life-changing experience; it has helped George “crack the code” behind math and science and it has given him the incentive to give back to his community.

I’ve learned to be patient more. I learned that science, just like math, is a universal code. Now I’m so curious, wanting to know about anything. Why is it raining? Where does the water go? I’ve been watching a lot of the Discovery Channel since I joined CASE. And I’m going to give back. Since I’ve been with CASE I’m fulfilled by giving back to these kids. My mom always raised me to give back. This kind of giving I need for my personal enrichment. I could be doing other things. But, this gives me a chance to just give back to my church. This is helping other people and their families. That’s why when kids ask me something, if I don’t know, I try to figure out how to get the answer for them. I tell them, “I’m not sure of that, but I will find out,” and I get back to them. Sometimes a kid would ask me a question. I didn’t know it. And I remember specifically getting their number and calling them back, and asking them, “Remember that question?” And I would never take time to do something like that before. So, CASE has been tremendous in my life.
George feels he owes his involvement in PISEC to the influence of his mother and a family friend. As a result of following their lead he has gained skills, and confidence.

Until they sat down and said to me, “This is a wonderful chance to give back. They don’t have much money, so don’t even worry about the money, but if you start it, you have to have a commitment.” I promised her that I would complete it. And by goodness, it’s the best dang choice I ever made in my life.

I knew I could learn the science behind the workshops, but to tell somebody else about it and then explain to them so that they can understand took another skill I had to learn. I took a leadership workshop for a month. That was a month of good, solid training. Because speaking in front of people, oh no. But, those exercises that you told us in the beginning—ice-breakers—did [it].

George is now spreading the word about PISEC and bringing in new participants.

As a matter of fact, I’ve asked my sister. She became involved because of me. I said, “Alletta, you need to check out these things. These are some workshops that you would enjoy.” At that time in her life, she was in a wheelchair. She needed something to keep her mind off of what she was going through physically. She came to one of the workshops, and, she said to me, “George, I can do this.”

When she went to the first workshop, it was with Jim. And Jim is one of the best. Jim did the workshop on the heart. And my sister was in the scooter, and there’s that race you can do where you draw a picture of the heart, then you’ve got to go through the heart . . . like a relay race. And my sister was the bomb. She had so much fun in her little scooter—she went and backed it up, and did [it] all. Everybody didn’t pay attention to how she was—she couldn’t run and she was in a wheelchair; they didn’t make fun of her. People were just real people. Now she’s spreading the word! You know we have just been blessed to have good people at CASE.

The science George and his wife have learned changed the couple’s attitude toward travel. Understanding the science behind flight and buoyancy has alleviated their anxieties—and allowed them to plan a cruise.

My wife likes to control everything in her life. Like the sky bike and the rope is the only thing holding you up there. She would not get on it because she didn’t understand there’s laws you know, laws of gravity, laws of physics. Now, she does. She understands, “Okay, I just won’t go in the ocean and sink even though a storm might come.” She understands that because of the workshops, because of the sink or float workshop. There [are] so many things that we’re doing now because of science, because she’s been involved. It’s not just somebody telling you, lecturing you. [In] our workshops people get involved.
Before, we used to go to a movie or something, alright, or go out to eat. But now, we have workshops. My wife works almost 10 hours a day. But, workshops sometimes are at nighttime and she still comes to our workshops.

PISEC has helped George find a purpose and an active way of engaging in the wider community. As a result of his involvement in the program, he feels he has a gift to share.

I’m going because, first of all, I’m going to make sure that my family members can get in without any trouble. Then, I’m going for me. I want to see things that I didn’t see. I heard you have the Star Trek exhibit. I’m just going there because I like going there. There’s something to do now besides sit in the house and watch television.

Before PISEC I’d say, “Give me a nice T.V. movie and cable, and I’m fine.” Now, I put the remote down and get on out of here! It’s just something that I can do. I got a gift, man, I got a skill. Now I can explain to somebody else.

We have a lot of get-togethers on different holidays. And at the houses, we play games, but along with the games, my wife and I, we come up with stuff we learned from The Franklin Institute. This is what I say: Anybody who has a chance, just to come to a PISEC [program] or come to a museum, or, come to a workshop of ours—it’ll be a life-changing experience.
Delia Ramirez is a mother of three and a long-time PISEC participant. Over the years, her daughter’s special interest in science blossomed through PISEC; today Delia’s daughter is a CASE ambassador and an Outward Bound participant and is planning a science-related career.

Delia Ramirez

TAKEAWAY MESSAGE FROM DELIA RAMIREZ:

I wasn’t that good at science. I didn’t know much about animals and stuff like that, so I like the fact that I learn a lot. The events are nice—I love them, especially because it’s a family thing, and that’s what makes it nicer. Plus, we have little ones growing up, and they teach them how to grow together and especially learning about science—that’s the best thing.

When Delia and her children first came to PISEC events, they had had almost no experience with hands-on science. Today, Delia’s 17-year-old daughter is a CASE ambassador. For Delia, it is the family orientation of PISEC programs that is particularly attractive. It offers something for people of all ages.

The best PISEC experience we had was at the Aquarium, when they swim with the sharks inside [the tank] and all the families are there. We watched the divers swimming next to the sharks. It was fun. I’d be afraid to go in next to a shark. They say that sharks don’t eat people, and I said, “Oh my God, I didn’t even know!” I learned so many things about sharks that I didn’t even know. So I think that was a fun one for me.
And they gave us a shark tooth. I didn’t know they lose so many teeth…I was stunned by that program, that show. All my family came together to the program. It was real nice. Everybody said they had a nice time, and it was beautiful. Everybody loved it; we all shared . . . That was the first time my whole family got together.

My daughter is now a CASE ambassador. Years ago, though, she was just participating in the program. They used to send invitations out to the families in our CBO, so that’s how it started. And now my daughter is an ambassador. This is going to be her third year. She’s going to be an ambassador again, and she loves it.

I just love it. I just wish I had kids now. I have nieces and nephews, and my son is going to be 23, and my daughter is an ambassador—she’s 17. But I just wish I had more kids, and more grandkids, so I could bring them to the program…it’s so fun to see the faces on the kids when they’re learning about science.

It may have been Delia who first brought her family to PISEC, but it was her daughter’s special interest in science that really engaged the family. Now, Delia herself has found a new interest in science, and her daughter’s interest has turned into a career direction.
I'm not too good at science. My daughter and my son love science. That's why I started to love science. I got interested because my daughter, the one that's an ambassador, she loved science even before PISEC. I said, “Why does she love science so much?” That's why I started getting interested in these programs. My husband, he liked it because he never spent time with the kids in school, so the PISEC program was a time for him to spend with the kids. When he came to this program, he spent time with the kids. And it was nice.

I didn't know what science was, so for me, it wasn't that interesting. But now I see it differently, especially now that I see my daughter is so interested in science. She's a scientific girl. She just went up to the mountains to Outward Bound, [in] North Carolina for a 20-day hiking thing. She was kind of scared, but she made it, and they gave us a certificate. They sent me a letter yesterday. They said she was brave—yeah, they said she did everything. She brought a little stick from over there, to remind her that she was in North Carolina, and she came with pictures and everything. She loved it. She said she loved the country, but I see that she loves science. She just loves science.

Before PISEC, Delia didn't have the tools to support her daughter's special interest in science. Now, she sees the program as an important element in her daughter's growth and as potentially valuable to all teens.

Before PISEC, our family went to the lake and the beaches, that's it, or to parks and stuff like that. We didn't go to museums until we came to the programs. But now I can see how important it is. My daughter was in North Carolina during the CASE graduation, and I was there to pick up her certificate. You know, I said, “I can't miss this event.” I just love it, I love it. But I think science is important—I didn't think it was that important, but now I know it is.

I think this program is nice for the teenagers. I like the fact that they could focus on a career, too, because I see it as a career. Because ever since my daughter started this program, it's motivated her to work, and to look more to the future. And it's a career motivation for the young kids, too.

Because her family has little money, Delia never saw museums as within her reach, except through school field trips. She sees PISEC as a way to enrich her own life, her family's life, and the lives of her extended family and neighbors.

When my kids went to school, I didn't know much about museums. But they used to take my kids to museums on school trips. I learned about science museums, The Franklin Institute and all, and I used to love them. I heard about the program and I said, “Oh, this is the museum I like to go to,” but I couldn't afford to, because my life is kind of hard, as a lower-income family, so it's not easy to come to the museum.
It was nice when I heard about the program. I said, “Oh, this is free! We can go as a family.” I invited a lot of neighbors too. It’s been a great experience. I think the museum programs are more fun than most of our family activities, because they make it fun for the kids. They have activities and they really go into what they say and do. With PISEC you know that they’re really going to do what they say they’re going to do. Sometimes they send you a little card in the mail, they say they’re going to do activities with the kids, and they really do it.

I say to my neighbors, if they have an event, “You come along with me, and you’ll get an invitation, then you can go to the next event.” I got all my neighbors to go, and they just love it. “Oh, we’re going to the museum; they sent me a letter. Are you going?” And then it would spread all through the neighborhood, and I said, “Yes, I’m going.” And they said, “Can we invite people?” and I said, “You could invite your family to come along.” So it’s nice, that’s all I can say—that it’s a nice program.
Lidia Rivera is a single parent with four children. She has been a part of PISEC since the very beginning and involved her children from their youngest years. Over time, she has seen her children develop their interest in science. Now her grandson is taking advantage of PISEC programs. Her initial incentive for joining was a free opportunity to get out of the house with young children, but today she sees PISEC as valuable for many other reasons.

**TAKEAWAY MESSAGE FROM LIDIA RIVERA:**

*In essence, PISEC just opened our minds to other things. I'm hoping that, when my kids get older, they can do these things with their kids or even on their own. You know, science is always changing. Things are always changing. So there's always something new.*

Lidia's connection with PISEC began early and continues to the present. She now brings her grandson and other family members. She sees the program as an opportunity to engage the whole family in a positive experience.

*I think I enjoyed PISEC the most at the beginning, because my kids were younger, and that's when they were like, more into "wow"! Everything's new—the animals and all that other stuff. Now they're older. They know a lot about the stuff, and though they get excited and they like it, it's not as exciting to watch as when they were younger.*

*My oldest is now 23 and the other ones are 11, 12, and 17. But now I have my grandson, so you know, I get to watch him as I watch my other ones, my 11- and 12- year-old.*
We started participating because, for one thing, it was free. Plus, when PISEC first started, I wasn’t working, so I was at home. My daughter was very young, and I didn’t want to go back to work until they were older. So, it helped me get to take them to places, without having to take it out of pocket. That was a great help.

I like the fact that PISEC programs involve everybody. And I’m able to take my grandson and my daughter-in-law and talk about the program. Everybody that knows me knows I go to just about every trip; I try not to miss one. And this year with the CASE program, I’ve really enjoyed the classes and the workshops.

Because of PISEC, Lidia felt empowered to support her son’s budding interest in science. In addition to taking part in planned programs, she also purchased a membership to the Aquarium.

My 12-year-old is very hyper, very curious. He’s always been interested in science, how things work. Before PISEC, we’d usually go to the movies, the parks; in the summertime, Sesame Place, Great Adventure. That type of stuff. But, to actually, sit down and decide to go to a museum—I’d never done that.

Because of PISEC, we got the Zoo membership free. So, I’ve been a member since then. So, that’s kept me involved. I even had the Aquarium membership for a while. With my grandson, and with the [Aquarium’s] renovations, I’m planning on getting that renewed. So, we’ve had more involvement even when it hasn’t been part of the program. But, the program’s just a big plus.

When we go on the PISEC programs, there’s already an agenda. You know more or less what you’re going to do. When you know there’s already a schedule, it’s more organized, and you know more or less what you want to look at and what you want to do. And they have the activities that get everybody involved, which is great.

PISEC has changed the Rivera family’s perspective on science and on the idea of visiting science museums. Prior to PISEC, science museums were not on the agenda. Today, the Rivera’s make it a priority to visit and revisit Philadelphia’s many science-related destinations.

One year, even after PISEC, when they were still little, we took a trip to Philadelphia. We went in the car and parked and we just walked around to the museums. That’s something I would’ve never really done on my own. So, you know, things like that I would hope to continue to do. Now that I’m working, I don’t make a lot of money, but I try to save money for places to go.

I see my son continuing with science. He’s got a knack for it, so, hopefully, he’ll continue and something will come out of it.
Lidia sees programs like PISEC as a benefit not only to her family but for the larger community. In addition to opening doors to young learners, it is also a tool for building stronger families and keeping children engaged in positive activities.

_I hope that programs do continue. It’s a shame that a lot of parents who can take advantage of it don’t take advantage of it, because they really don’t know how much they’re losing out on. Kids are in school from September to July, and it seems like forever, but these are activities that really involve the family. I know with my family, I’ve noticed that when we do anything for the program, we seem to really get involved with it as a unit, which is what’s important. I just tell people, when I see them, “Oh, you don’t know about the program? Well, then you should go.” And I try and get more people involved when I notice they’re not in with the program._

_I mean, it’s so great for the kids, for the families, and I hope they do take advantage of it. I know I sure do._
Cassandra is a married mother of one, who works in the hotel industry. Her husband, Grady, has attended several of the CASE workshops along with her. The Sanders live in Camden, NJ, and heard about CASE through their daughter’s school, LEAP Academy University Charter School. LEAP is a K–12 charter school, with an emphasis on math and science education, affiliated with Rutgers University. Cassandra was an ambassador for the first year of CASE, but left during the second year, because of her job commitments in the hotel industry. She then came back to CASE as an ambassador for year three. In year four, Cassandra’s daughter Kennedy left LEAP Academy and went to Friends School in New Jersey. Cassandra enjoyed the CASE program so much that she stayed on as an ambassador in year four often bringing Kennedy along to watch.

**TAKEAWAY MESSAGE FROM CASSANDRA SANDERS:**

*It’s one of the few things I do for myself that’s totally for myself and enriches me. I don’t do many personal things because I do work and I have a kid, and I don’t do exercise or those other fun things people do, but I’m going to do the CASE program because that’s a personal reward. It’s one of the few things that I’ve done for a couple years that made me feel happy.*

Cassandra heard of the CASE ambassador program through a friend who was active at her daughter’s school. For Cassandra, CASE sounded like an interesting opportunity, as well as a chance to give back to the community.

*[My friend Sandra said] “There’s another program that we want to do, I think it’s with The Franklin Institute; it’s CASE. We’re going to do some great training, and we’re going to go to their museums and stuff,” and I had thought that seemed fascinating for quite a few reasons. We had already been to the museums . . . so it . . . would be really interesting to start there.*
I felt like we’d try out more of the museums and learn different things. I thought it was great to take that back to the community especially in Camden, because I’m not sure how many people knew about coming over here and doing exciting things with their children and that the cost wouldn’t be an issue. I felt I could be helpful with the projects and stuff, and I thought it would be fun.

Once she got involved, Cassandra discovered that CASE was a terrific setting for a person who enjoys learning, working with people, and sharing knowledge.

I think you have to be outgoing, I think you have to be observant—not just learning the things and the programs, but you also you have to work around different people . . . I’ve done training before in different aspects, but I’ve just gained so much knowledge through the CASE program. The workshops were amazing and they kind of built. The Zoo is always fun and exciting, the Aquarium is great, but the last program we did at the Natural Science Museum was just fantastic. [For example, the workshop on] rocks was fun, the water was fun… My daughter Kennedy and I had great experiences, and being around the property, it’s almost like you’re feeling at home when you’re here at the museum.

Cassandra says that her feelings about science and math have become more positive since starting as a member of the CASE program. She has wonderful memories of CASE events, staff, and families.

[Before CASE], Kennedy and I would buy the membership, and we’d come to the exhibits. We would come there, maybe every month or six weeks, to go and see and to learn stuff, to put her on the same level as I am, and interest her in science and math as a well-rounded person. But with CASE I’m sure kids went back to their science class and asked questions . . . but they now knew something and everybody else is looking around wondering, “Wow, what’s an invertebrate?” That had to be really fun, you know.

[Some of my best memories are] from the graduation from three years ago. We were at the primate zoo and we had the gorillas in the back, but there was this guy with this instrument playing along at the same time, and I thought that was fascinating.

I think the animals and the fish were fun. Ruth from the Aquarium took us up to see the sharks from the top. I’m sure some people could do that anyway, but we have never done that sort of thing. I think it’s a learning experience, too. When it was all adults it was wonderful, but I think that when students came in, that was a different learning experience for me.

There were adorable kids. There’s one little boy, and he always reminds me of a Manx cat, with little cat eyes. He was like this peewee, you know, in diapers and stuff, and now he can
sit there and answer questions. Kids like him still remember those sorts of things. We will be some place and they’ll be like, “Oh, that’s Kennedy’s mom—she taught CASE,” so you can see them growing. One mom with a little boy and little girl first brought them, and then she brought her mom, and then she brought her friend. So it was a community—it really was.

Cassandra feels that learning begins during the CASE workshops. Over time, though, family participants begin to feel a sense of connection with the PISEC museums and continue their learning by visiting on their own.

*I love visiting the [museums] during the year; they don't just learn when they're in a CASE workshop; they go back out and see something and think of what we've done . . . They're going to come back here, and they're going to walk through the [Giant Heart at The Franklin Institute]. We kind of understand [science] a little bit better. You compare or connect, and you have a bit more knowledge when you do it.*

Today, Cassandra and her daughter have found ways to extend science and math discovery into their daily lives. They are fans of science-based television and science websites.
Both of us are into it, because of the Discovery Channel, watching fun things like “Myth Busters.” After [completing the CASE Kitchen Chemistry workshop], we would always talk about how when you make cookies you measure stuff, then you’re going to put stuff together, and you’re going to mix some chemistry. Science and math are important, even if you go into something that’s literature-related. It’s good to be well rounded. We need math; we need science.

We’d always watch a lot of science programs on Animal Planet, and my daughter wants to be a vet. I told her, “If you’re going to be a vet, you’re going to have to learn chemistry in college, and physics and math.” You need to start them now so they finish up later.

Maybe if we weren’t interested in the science and we didn’t go to the museums, maybe we would not have watched the Discovery Channel. Maybe we wouldn’t watch the Science Channel as much.

Even now that her daughter is no longer at the school that is part of PISEC, Cassandra has decided to stay involved.

It’s worth my personal time; it makes me feel like I’m doing something worthwhile. You know if I left the industry . . . the hotel, I’d probably love to teach . . . It makes me feel better. That year I didn’t do it was horrible for me—seriously.

You know, when you raise a child, you need a much bigger community; to take everybody in a classroom once a month and to teach them about science that really is going to enrich their lives.

[When we went on a whale watch with the Aquarium] we were so close and there were so many of them they could be touched. That was the most amazing thing I have seen, and I would do it again in a heartbeat.
Serena Spearman started in PISEC before the CASE program and then became a CASE ambassador. Her interest began when she realized it would be possible to offer community members low-cost access to PISEC museums. Since those early days, Serena and her family have become increasingly involved with PISEC. Today, she says, PISEC has changed her life.

**serena SPEARMAN**

**TAKEAWAY MESSAGE FROM SERENA SPEARMAN:**

What makes CASE different is that you have a whole community of families that are involved. With CASE, your family members—aunt, uncles, and grandmom are there—and it’s also neighbors and people that are just in the community, and storeowners find out. They’re able to donate sometimes, like a snack for the children, so I think that it is bringing our community together.

When Serena joined PISEC, her interest was in access to local attractions. Over time, she discovered the value of involving whole families in learning science.

When I first got involved with PISEC, I thought it was great to get a pass and be able to distribute it to families in the community, because the community that I live in is mainly low, low income. A lot of the children are not exposed to the museums unless it’s on a field trip with their school. And a lot of the schools have cut the field trips out. So, a lot of them had never been inside of the museums or the Zoo or the Aquarium, so it’s been an enriching experience for the community.
I like my team that I work with, and how we’re able to get the program and the lesson to the families in a cooperative way as a team. I like the way the children look forward to us giving them the workshop. And I like working with all the PISEC leaders.

We took a day trip out to one of the state parks. And several of the children that attended CASE were able to label the trees [as a result of a] tree workshop in June, I think, so that was one of those teachable moments. That was really, like, “Aw, man! It’s working!” The children really pick up different things. Like they’ll see some cubs, and they’ll say, “Oh, we can tell what they ate!” I just think that has really helped our children to advance in science.

Serena’s entire family has benefited from involvement with PISEC programs.

Everyone participates. Because my husband helps get out the kit, my daughter helps transport things when needed, and my grandchildren are making sure everything takes place. And so we’re all involved in CASE. From CASE, my grandson was able to attend his first year in a science exploration program here at The Franklin Institute. And it really helped. It has paid off.

In the past, we’d probably just go out to dinner. Sometimes we’d venture out to the museums, but not a lot because it was just too expensive. Now that we’re involved with CASE, though, we actually rent buses out to bring families into the special CASE events at the museums.
To make it possible to participate in CASE, I manage my time a little differently, you know, trying to take out time to put something special into the CASE workshops. I like to take it a little farther. So say we're working on sea life. Then I'm going to try to go to the pet store and buy some kind of fish or sea life, something. I'm going to make some kind of T-shirts or aprons or something that, when the children look at you, they're going to say, “Oh, okay. I recognize that.” You know, so I always try to take our workshops and go the extra mile.

Serena sees PISEC programs as a way to connect an entire community of families all of whom have a special interest in learning. As they attend more programs, families become more invested and connected to PISEC and to one another.

I get really excited about the preparation, how the children are going to react to certain things. I definitely have started taking pictures and just keeping some documentation of what we're doing, and I put myself in it so that the children can get the most out of it.

Over time, the children started talking about things that we went over in the workshops, and parents have been asking, “Is something coming up?” They've been asking me, you know, “Are we doing anything?” “What’s going on?” My favorite thing about being an ambassador is just being involved with the communities, families and the community. I really enjoy that.

Serena believes that a good CASE ambassador needs patience and a willingness to learn and to share. By bringing those qualities to the project, she has succeeded in making a difference to the community and to herself.

I think the quality you need as an ambassador is patience. You don't have to be knowledgeable about science—you don't need that—but you need to have the will to want to learn new things and share them [to] have a quality of sharing and just being able to know that everyone is different. You're going to run into a lot of different attitudes and things. You need the quality just to be patient and be able to deal with a lot of different things, because there's always a surprise.

I think all of my team had these qualities when they came. I think they have grown and the qualities have just gotten better since working with the communities, because now, we're able to jump right in anywhere and do our workshops. When I first started, I thought, “Man, now I can teach science, be some kind of, like, science teacher,” and yes, I've gotten that out of it, I really have learned new ways of teaching things. I think I'm kind of talented in making a special moment for the children. I think being in CASE has really brought out more of that talent in me.
Le-Quyen Vu is the Program Director of the Indo-Chinese American Council (IAC), one of the CBOs involved with the PISEC project. In that capacity, she is CBO representative to PISEC. Le-Quyen and her husband have two young daughters, Zoey and Emily. Together, Le-Quyen and her family have attended many PISEC events and programs. Le-Quyen herself has played a major role in planning and managing PISEC-related excursions for her CBO community of multi-lingual families.

**TAKEAWAY MESSAGE FROM LE QUYEN-VU:**

*It is very hard for second-language parents. A lot of times the children learn the language very fast. So when the parents come home, they have to ask, “What does this mean?” “Can you explain to me what this note said?” But when you do that, it’s so formal, you know. The children have to sit and explain.*

*But in these [museum] settings, it’s a lot less formal. The children are explaining to the parents what it is. When English is the second language, the parents a lot of the times do have an education from their country, they do finish high school, but they may not have the education beyond that. They have the basic science. But they don’t have the language. So the children explain what is in the exhibits and the parents can learn the English through the children.*

When she was first recruited to become a part of PISEC, Le-Quyen saw the program as an opportunity to involve parents in their children’s education. As the director of a CBO that focuses on literacy, she immediately saw the program’s potential for her constituency.
PISEC to me is not just a field trip; it’s science education. As a person who works at the community center, we’re always looking for a fun way to present education, and PISEC does that, which is very good. It’s hard to get the family to come without the fun part.

When we were recruited [by a staff member at The Academy of Natural Sciences], I was thinking, “Oh, this sounds good. It’s cool.” But I had little knowledge about what it was about. As I got involved, I saw right away that this was the piece of the puzzle we were looking for. We believe in the motto, “Children, Parents Together” and work with parents whose education is below high-school level. It can be hard to get the parents involved; it’s kind of intimidating to them, so this is great, because the parents and children talk together, and I don’t have to create something for them.

Le-Quyen found the large PISEC events to be the most memorable. She enjoys taking an active role in greeting her members and is pleased to see whole families taking part in an educational event.

It has always been the big event that’s the most joyful memory because I work with my family. My family sees what I do, which is beyond “mommy goes to work in her office.” It helps them to understand a little bit more about family literacy and how parents and children are related. Sometimes we do that with our own family, but we forget other people are struggling with it. So that, for me, part of what’s memorable is that I get to see whole families, which is amazing. We don’t have the manpower or the space to do those things, but PISEC events are venues to connect together and also for the children to be involved and taking part in activities.

I remember working at the Zoo. I was checking people in, seeing the smiles. The event at the Aquarium has always been a popular one. It’s hard to pinpoint one especially great event, but standing out there seeing and greeting the people is fun, and my whole family has fun. To me, what I remember most are the people I work with. You know, seeing them, hearing them talk the next day about the Aquarium. They tell me the kids had fun; or say things like, “I did not really realize that the aquarium has hippos.” That was one of the first times people went. It was eye-opening and then they show pictures to me. That was a memorable moment. You realize you’re part of their family.

Because many of Le-Quyen’s constituents don’t speak English, multi-generational educational events can be challenging. PISEC took her constituents’ needs into account, and provided opportunities for multi-generational, multi-lingual learning.

Well, I’ve always believed that people learn even when they’re not just sitting in the classroom. Learning takes different shapes and ways. The museums, The Academy of Natural Sciences, and The Franklin Institute—all of these offer opportunities to learn.
Most of the time the children go to visit these venues because of a school trip. So the education is from teacher to student, which is different than from parent to children. So these [PISEC] events, to me, have more meaning, because the parents may be recruited with the children to go to these events. They are also learning with the children. Remember I also work with parents who dropped out of school in the fourth or fifth grade. So for them, learning along with the children was wonderful, and it is also a venue where the children could help them. You know, the roles reversed, and I think that was both touching and cool.

I don’t know of any museum that’s doing it the way you’re doing it. We reach out to the Art Museum, for example. The education is entirely different—it’s usually a group setting, a school-based setting, a classroom-based setting; it’s not a family-based setting, which is what I strongly favor.

Le-Quyen’s only frustrations with PISEC are its limitations relative to funding for transportation. She feels she could involve more families if more resources were available.

I just wish that it could be bigger and that the museums had more resources, so that we could do more than this. The limited amount of things that we do—that’s the part that I don’t like the most. I wish I could just say to everybody at this event, “Bring everybody. Okay, but if you can’t get there on your own; we’ll help you. We’re not limited to two buses or three buses.”

Last week there was an event. We used to have two buses, but it’s limited to one, because the bus fare was three hundred dollars to bring these families. So it was a difficult decision. Do we pick a family from South Philly or North Philly? Which one gets to go this time? That’s the part I hate.

Le-Quyen would recommend this program to families as a tool for teaching, bonding, and building positive memories.

I’m a strong believer in education. Education is the key to everything. I’m also a strong believer in education taking different sizes and shapes. These programs are the museums’ answer to family outreach. This is how you do it.

I would let families know that this is the time when you build your family’s strength, your family connections, but also a time when you get to be your children’s teacher. Do it because ten to fifteen years from now, children will remember this. I would tell them, “It’s fun—do it.”

We have families that come to us and they ask me, “Do you still have the PISEC program? When do you have the trip?” Last week, a family called me who I have not seen for years and said, “I heard something is going on this week is that true? Is there a trip?” I would really say this is where you spend the least money and have the most impact.
Years from now, our children will remember the fun. Today on the way down here, as soon as I turned into the lot, they started to remember what they did. My daughter said, “Mommy, I remember this!” So they started talking. So to me they learn a lot, but to them it’s a fun memory—it’s the fun memory that they treasure. It’s very evident, when I turn onto 21st street, and they see the lot—they haven’t seen the museum yet—my daughter said, “Oh yeah, I remember! I remember! Go here!” They remember about the food, but they remember a lot about the fun.

Le-Quyen sees the PISEC experience as a tool to build scientific curiosity in her family and community. PISEC also inspires and reinforces her children’s scientific thinking in daily life.

I work in the social work arena, but my husband is an engineer. So science is something that grew in our family. Wherever we go, we visit science museums. Whatever we do at home is an experiment with science.

We do a lot of science at home. For example, the children are experimenting with different plants this year. They planted the pots last year themselves, and each one has an area. So they’re trying to figure out why one area grows and the other one doesn’t. Science is something we do constantly. We do that when we’re cooking. We make flan at home. Lately I’ve been lazy so I’ve been buying them. And then the kids didn’t understand why the one we buy was so thick. I have to explain why this one has so many bubbles and this one doesn’t.

I think you don’t have to be conscious about doing science to explain to children why things are happening—food, materials, whatever it is. I don’t make a point in doing that, but subconsciously, the explanations are science-based. To be conscious about not using chemicals, we do that at home a lot. We’re slowly explaining to Emily about using all of these chemicals and what it affects. This is slow learning. She’s only in kindergarten, so she says, “What is a chemical? What does that mean? How does that happen?”

For our family, PISEC events reinforce our interest in science. Growing up and having good knowledge about science is important in their lives. They have an understanding about people that is related to science. Zoe, right now her dream is to be a vet because she loves animals, she wants to take care of animals, but she also wants to be good at karate. Emily has always loved drawing, so fine arts are something she likes. When she was growing up, we took her to all these workshops on how science related and how you can be many things. So now she wants to be an artist and also wants to be a teacher who teaches math, because she says math is easier to teach. So you know, I think somehow getting involved is the best way to understand how things are related.

We look at it differently because we’re the literacy agency. Our goal and our curriculum is really focused on parents as the teachers of the children…So the science aspect helps parents
to guide their children through science and not be intimidated about science. For children, everything is educational. Over here at The Franklin Institute they learn about matter and things. At the Zoo they learn about animals. Learning is everywhere—and it’s fun.

Before we go to exhibits we talk about them. Before seeing Body Worlds we talked to them, explaining, “You’re going to see this; you’re going to see that.” And as we’re going along, we are explaining to them what they see and drawing comparisons with real life. We had to come back twice to Body Worlds because my husband’s family came from New Hampshire. He’s a doctor so he wanted to show his son about his work. We were trying to explain to them about exercise and wanted to show them people with arthritis. The oldest one is 13. They can relate to that and relate to eating healthy. With this evidence it’s easier for them to understand and make personal connections.

Le-Quyen feels that members of her CBO benefit tremendously from the availability of PISEC programs. Without PISEC, she says, few would have the resources to visit the member institutions.
Economically, without the program, our community would not have visited the places. With the program, you know we don't have to plan it—it's just their choice of what we want to do this weekend. Without it, if they asked to do this and go here, we're going to have to plan it out. “Okay, this is going to cost this much, so we're going to have to do it wisely.”

In general, I think without the pass, these four places would not be on their list of a place to go. The pass helps, because if they only have time for two hours, they are still likely to go. If they have to pay they want to make the most out of what they paid. So it would have to be the whole day. So it's less likely the family would pay that much money.

I think they would buy memberships if they could afford it. I think the issue is affordability. Usually a membership is one-and-a-half visits and usually people think of it that way. Most of the time they know that they're paying for it already. Because in the city, some classes take these children to these events.

It is up to parents, Le-Quyen says, to promote their children's learning. PISEC is one among several avenues for encouraging science learning in her family.

Outside of PISEC, we get involved where we live. They go to the community center. It has classes; it's called “little science projects,” and what they do there is have fun. They learn silly experiments and make Play-Doh out of flour—those sort of things. Then they go home and make a mess and ask you to sit in it with them. So yeah, we do sign them up for events.

At home, my husband reads the Scientific Journal [sic] and Science magazine. We're also strong fans of Nova. The kids watch whatever the adults watch. But we don't watch a lot of TV, because we both work and by the time we get home the kids have had dinner and it's eight o'clock, so we have an hour and a half, pretty much.

I always go back to the family thing. PISEC provides parents with tools to be their children's teacher. When the kid is young, in primary grades, in elementary school, it's the parents who have to promote learning. The kids have fun no matter what.
Museum/Community Programs over Time

The PISEC experience is a long-term urban collaboration and a model of successful community partnership for museums. The stories featured in this volume demonstrate the impact of participation in successive grant-funded programs on the identity, interactions, and interests of families and individual participants from a wide variety of backgrounds. The program has also had an impact on participating CBOs, the broader Philadelphia and Camden communities, and the professional museum community. Through its ongoing program, PISEC continues to change attitudes toward and understanding of science and technology in thousands of households throughout the Greater Philadelphia area.

Impact on Individuals and Families

This publication shares the reflections of people whose lives have been changed through their involvement in grant-funded programs. They show us that such programs can initiate a process that extends beyond the experience available in museums or at community-based organizations. PISEC created a network of people with a shared interest and enthusiasm for science and a commitment to children and families.

How far do families go once they have determined that science activities are worthwhile and meaningful for their families? Long-term involvement had broad impacts on the lives of frequent participants and their families. The stories told here show how parents value these family learning opportunities. Parents noted that the program expanded their repertoire of family activities, including more visits to museums and zoos and more science-focused activities. Parents observed their children’s increased interest in science and they observed with pride their children’s increased competence in school science classes. Several noted that their children’s career interests had shifted as a result of their participation in the program.

Both participants and science ambassadors were enthusiastic about the program. They valued the workshops that emphasized experiencing science in a hands-on, engaging way and the museum events which helped families feel like they were part of a privileged community of knowledgeable visitors.
Families Learning Together

Parents appreciated the opportunity to learn from and along with their children. Many of the parents recounted with excitement specific moments during workshops or in museums when they experienced a sense of wonder in learning science. Some indicated that participation increased their confidence in their own science abilities. They found that the format of the workshops removed the pressure of teaching from parents and the stress of assessment from children, allowing them to relax and enjoy doing science together. Beyond learning about science, parents and grandparents emphasized the value of spending time together as a family. They developed strong family connections to science as they experienced its relevance in their everyday lives.

The experience of learning together helped to improve communication between parents and children. Consistent and regular opportunities for involvement created many opportunities for intergenerational learning. Parents and grandparents were impressed with how otherwise easily-distracted youth were involved through a variety of interesting programs and experiences. The workshops gave children a sustained opportunity to engage in science, and provided multiple perspectives on what it means to be a scientist and to pursue a science-related career.

Impact on Science Ambassadors

For some of the ambassadors, the experience was truly life-altering. For the first time, they saw themselves as teachers and mentors, providing their community with valuable services and knowledge. Some of the profiles in this book reflect that experience, along with the practical outcomes of growing self-esteem and enhanced ability.

In particular, the science ambassadors developed greater confidence in their knowledge of science and in their ability to teach others. They became community leaders, taking pride in adapting programs to meet the needs, interests, and learning styles of their constituents. The CASE program helped them to develop self-assurance, a sense of purpose, and skills in communicating and teaching. Ambassadors were inspired by their experience and often continued to pursue work as community leaders and teachers after completing their work with the CASE program. Their membership in the community was an essential part of their role. It allowed them to develop relationships with participants that extended beyond the CASE program. In several
instances, ambassadors created additional science opportunities for themselves and their communities in partnership with local schools and other CBOs. For CBOs, the ambassadors have become a significant resource, increasing organizational capacity to provide valuable educational programs to member families.

CLUES, the next PISEC project, takes the science ambassador concept a step further to a formal apprenticeship program. While CASE ambassadors were trained to present museum-developed programs in the CBO setting, CLUES apprentices receive the training, experience, and mentorship to create their own science workshops and to train other community members to present them. The concept behind the apprentice program is that building permanent CBO capacity will expand the community’s ability to provide family science learning experiences.

Forging New Interests in Science

The participants profiled here found that learning science increased their interest and curiosity in all aspects of their lives—their homes, vacations, and daily routines. Families reported thinking about science during storms, cooking dinner, taking a bath, on vacation, and traveling. Some families repeated workshop activities at home, continuing the family’s learning after the workshops were over. Many parents indicated that they felt that program participation helped their children succeed in school and encouraged their children to consider careers in science.

Nurturing a New Interest in Science and Museums

After participating in PISEC, both children and adults were eager to go to the museums, and saw them as positive alternatives to watching television or playing videogames. For the families who had attended museums prior to the program, the workshops and the program community offered a new way to experience the museum.

Some participants mentioned that they first joined the program in part because it offered a free opportunity to experience something new as a family. However, many later came to value their experiences in the museums enough to buy family memberships. The programs helped families feel like museum insiders and helped them enjoy visiting museums as a family.
Creating a Science-Focused Community Network

The program broke down barriers between members of different communities, creating a social and comfortable environment for everyone. Science ambassadors became community leaders and resources, answering science questions, making the program accessible to a variety of participants, and empowering families to do science projects on their own. Through the program, people became more engaged in science issues that faced their neighborhoods.

The strengths of long-term involvement are evident in the personal stories of active and dedicated participants, whose recollections serve as testimony to the impact of this series of programs. The program fostered multigenerational learning about science and enhanced family interactions and activities. It fostered connections among families and communities. Ambassadors, as community members, adopted roles as friendly and knowledgeable teachers and advocates. Workshops and museum activities helped adults and children alike begin to value, enjoy, and understand science and recognize and appreciate science in daily life.

Lessons Learned

A combination of characteristics contributed to the outcomes which have been described. These characteristics can be incorporated into other museum/community partnership programs.

- **Science was made accessible**
  *PISEC* brought science activities into communities, training community members to facilitate workshops in familiar neighborhood organizations. Ambassadors were trained and practiced leading workshops in museums, then brought their knowledge of the community and science together in local settings.

- **The program increased family interest and engagement in science**
  *PISEC* offered many and diverse opportunities for family participation. Frequent participants enjoyed the chance to visit multiple museums, participate in a variety of workshops close to home, and take home and try activities they learned about during the workshops.
• **Workshops encouraged whole-family engagement**
  Programs focused on hands-on, open-ended activities that enabled everyone to participate and allowed whole families to learn together. The emphasis on family learning provided an opportunity for high-quality family time.

• **Ambassadors were empowered to become leaders in their community**
  The ambassadors brought together their new knowledge of science, their personal knowledge of their own communities, and their own teaching style to tailor workshops to their community’s needs, interests, and issues.

**For the Future**

The *PISEC* group’s current project is *Communities of Learning for Urban Environments and Science (CLUES)*, which has extended its impact into the next decade. Future grants may allow the team to pursue even more radical approaches to making science an integral part of family and community life. Whatever the future holds, it is clear that long-term, intensive programming made possible through nearly two decades of grant-funding and collaborative effort have borne significant fruit. It is safe to say that the impact of *PISEC*’s family approach to science education will be felt in and outside of museums, within community organizations, and in households for many years to come. 👐
A Brief History of *PISEC*

The Philadelphia/Camden Informal Science Education Collaborative (*PISEC*) was formed in 1992 by four major Philadelphia-area informal science institutions—The Franklin Institute, the Philadelphia Zoo, The Academy of Natural Sciences, and The New Jersey State Aquarium—to conduct research and outreach projects in support of family science learning.

The Family Science Learning Project

From 1994 to 1998, the *PISEC* group conducted the *Family Science Learning Research Project* (FSLP), a research and development project funded by the National Science Foundation (ESI-9355504) and The Pew Charitable Trusts to find out how families learn science in informal settings. It led to the development of a new model for exhibit design based on seven characteristics of family-friendly exhibits. In 1998, *PISEC* published *Family Learning in Museums: the PISEC Perspective*, which reflects the group’s research findings. The primary results are that: (1) families form a learning unit that operates through conversations during and after a museum experience; (2) it is possible to deliberately create and measure the positive impact of family-oriented science learning opportunities. The publication now an instructional text for exhibit design, is available through the Association of Science-Technology Centers (http://www.astc.org/pubs/browse_publications.htm#research). Succeeding *PISEC* projects focused on outreach to underserved families.

Community Connections

The first of these outreach programs was *Community Connections*, funded by the Pew Charitable Trusts. The *PISEC* group reached out to organizations that had strong community ties, but little or no science-related programming. The challenge was to convince families connected with the CBOs to consider science programs as a viable part of their family activities. This outreach program was designed to diversify museum audiences and introduce families to science museums and family science learning. Each Community Based Organization (CBO) had a primary liaison that set up a local project committee of four to six people to work with them. One or two representatives from each CBO attended monthly project meetings. Those representatives reported back to their local project committees.
The project, which ran from 1995 to 1999, reached 17,000 people from eight community agencies working with African American and Latino families. *Working Together* (Wagner, et al., 2000) the project handbook, is a guide to building strong community partnerships.

**Families Exploring Science Together**

*Families Exploring Science Together (FEST)*, funded by NSF (ESI-9901961) and the William Penn Foundation ran from 1999 to 2003 and advanced community-based science programming and outreach. Each *PISEC* institution partnered with two or more community-based organizations, whose members were invited to take part in programs and events specifically tailored to encourage whole-family science learning. *FEST* served over 18,000 people from 12 community partner agencies; most were African American, Latino, and Asian families. Families attended orientations at the community sites, science workshops, and family science events at the museums.

**Community Ambassadors in Science Exploration**

*Community Ambassadors in Science Exploration (CASE)*, which ran from 2003 to 2009, funded by NSF (ESI-0337266) and Mellon Mid-Atlantic Trust, moved further in encouraging a diverse set of local communities to appreciate and understand science. The program trained a total of 144 Science Ambassadors who offered science workshops at community-based organizations in the languages spoken by their member families. Through *CASE*, the ambassadors gained training and experience in informal science education, opening the door to possible future career opportunities in community and museum settings. *CASE* served over 15,000 people over five years, through peer-presented family learning opportunities and museum experiences.

*PISEC*'s science ambassador program has extended the capacity of the CBOs. Today, each CBO is “home” to a team of trained science educators, who have gone through a structured training program. While CBOs continue to serve their communities with a wide range of programs and services, they have also integrated science programs and activities into their schedules.
Bridges Conference

In June, 2008, the PISEC group conducted the NSF-funded Bridges Conference, a national conference on family-focused museum/community partnership programs (DRL-0734835). Bridges offered an opportunity for sixty-five museum and community program staff members to share insights into opportunities and pitfalls presented by community-based programs. The Bridges website (http://Bridges.fi.edu) and manual “Museum/Community Partnerships”, based on conference findings, are intended to further the important work of museums and communities.

Communities of Learning for Urban Environments and Science

Building on PISEC’s 17-year history of museum-community research and collaboration, Communities of Learning for Urban Environments and Science (CLUES), a five-year program which began in October, 2009 creates a new model of family learning and professional development for members of underserved communities. CLUES enhances the capacity for science education within the CBOs. Like all PISEC projects, CLUES programs focus on whole families as learning units. In CLUES, science apprentices from the CBOs spend a year in each of the museums training to become science educators, developing family science workshops, and training community presenters to conduct the workshops for local families. CLUES workshops focus on environmental issues. The program creates a new paradigm for community-led science learning and environmental action for underserved families.


acknowledgements

Many people have contributed to this publication. First we must thank Kelly Linker, who as a college intern at The Franklin Institute conducted the initial retrospective interviews with long-term PISEC participants that made us realize the story was worth telling. Additional interns who have contributed to the manuscript include: Clara Cahill, Lindsay Deliman, and Amy Wen. Our co-PI’s at the PISEC museums include: Julie Johnson, Cheronda Frazier, and Angela Wenger, New Jersey Academy for Aquatic Sciences; Linda Cairnes, Ron Fricke, and Kathy Wagner, Philadelphia Zoo; and Nancy Peter, Naomi Echental, and Jacqueline Genovesi, The Academy of Natural Sciences. None of the PISEC programs would have been possible without our community partners: Christine and Carl Collins, Edith North, Loretta Ferguson, and Clara Mae Daniels, St. Thomas African-Episcopal Church; Norma Rosa-Santos, Carmen Ubarty Rivera, and Vanessa Jones, LEAP Academy University Charter School; Anita Franks, Falomi Club/Camp Fire USA; Dringa Morris, Helene Smith, and Terry Morgane-Macon, Imani Education Circle Charter School; Le-Quyen Vu, Jacquelyn Jordan, and Maria Thuy, Indochinese American Council; Joe Donawald, Stephen Schaeffer, Aleah Gathings, Andrea Saldivar, Ron Vasquez, and Terry Pittman, Congreso de Latinos Unidos; Betty Lui, Folk Arts Cultural Treasures Charter School; Sister Carol Keck, Kristen Danks, and Reed Davaz McGowan, Norris Square Neighborhood Project; Nia Riddick, Kristy Rivera, and Ariel Arnau, Frankford Group Ministry; Jamal-Kalee Ferguson, Judi Taylor-Dunn, and JoAnn Weinberger, Center for Literacy; Judith Blank, Renee Brooks, and Tommy Head, Ivy Leaf School; and Carol Chew Williams, Cobbs Creek Environmental Education Center. Our thanks to the PISEC advisory committee: Curtis Howard, School District of Philadelphia (retired); Deanna Banks Beane, Association of Science Technology Centers (retired); Beatrice Taylor, Port Discovery Children’s Museum (retired); Dale McCreedy, The Franklin Institute; Nicholas Torres, Congreso De Latinos Unidos; Ambra Hook, School District of Philadelphia; Ricardo Martino, formerly of the Norris Square Neighborhood Project; and Ismael Calderon, The Newark Museum. Finally, our thanks to the people who contributed their “voices” to this volume.
IN THEIR OWN VOICES
MUSEUMS AND COMMUNITIES CHANGING LIVES

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