Investigating The Implementation of the Be A Scientist! Project in New York City and Los Angeles

Formative Evaluation – Year One

Prepared by the Center for Children and Technology
Education Development Center, Inc.

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Introduction

The Center for Children and Technology (CCT) at Education Development Center, Inc., a nonprofit international research and development organization (cct.edc.org), conducted the formative evaluation of the first year's implementation of the Be A Scientist! (BAS) project. The goal of the BAS project is to provide quality science and engineering courses to underserved families in New York City and Los Angeles. As an afterschool science program, it targets first graders from underserved families.

Research Questions. The formative evaluation is guided by the following research questions:

1. Is the development and implementation of project materials, recruitment strategies, training, and course activities well designed and integrated into the project's goals?
2. How do participants experience the project?
3. What is the initial impact of the project on families, undergraduate engineering students, and project partners (e.g., universities, museums)?
4. What are the programmatic and strategic recommendations for the improvement of the project?

Methods. CCT employed a multi-method research approach, using logic model, teachers' logs, surveys, interviews, and site visits (see Appendix). The research instruments addressed the following themes: families' prior knowledge of and experience with science and engineering, the implementation of key project components, implementation successes and challenges, and impact of the project on participants.

CCT researchers collected relevant project documents (e.g., proposal) and consulted with the project's leaders to create a project logic model. They surveyed parents and students, and conducted site visits at the New York Hall of Science and several sites in Los Angeles), and interviewed project staff and partners. Table 1 details the number and type of evaluation activities over the course of the first year. All surveys and consent forms were made available in English and Spanish.

Table 1: Evaluation Activities

Site	Teacher Logs	Surveys		Interviews			Observations	
		Parents	Children	Iridescent Staff	University Partners	Museum Partners	Family Science Sessions	Undergraduates' Presentations
New York City	4	25	20	2	1 professor 1 student	1	1 session	4 presentations (8 students)
Los Angeles	24	170	216	3	2 professors 12 students	1	2 sessions	--
Total	**28**	**195**	**236**	**5**	**16**	**2**	**3**	**4**

CCT researchers employed both quantitative and qualitative methods of analysis on the data collected. For quantitative data (e.g., surveys), they used SPSS, a statistical software tool, to conduct descriptive data analyses. They read and coded the interview and observation data to identify the salience and substance of themes that surfaced around project's implementation, impact, and challenges.

CCT researchers worked collaboratively with BAS staff to implement the evaluation, and helped BAS staff build internal evaluation capacity for data collection and management.

Results

Results from the analyses of the collected data address families' profiles and educational expectations, the implementation of the key program components, participants' experiences of the project, and the impact of the project on participants.

Families

Based on parents' surveys, most parents who attended the family science sessions were female (76%), spoke Spanish at home (62%), and were introduced to the project through their child's school (90%).

At least half of the parents found science, math, engineering, and technology (STEM) jobs and careers to be very interesting (62%), very creative (56%), high paying (55%), very fun (53%), and secure and stable (50%). In addition, they believe STEM jobs and careers have a large positive impact on the world (68%).

Most families like to visit zoos, museums, etc., to observe things (71%), watch television programs about science (62%), ask questions (62%), watch movies and pictures of science events (58%), fix things (54%), and build things (57%).

Most families would like to listen to scientists and engineers talk about their jobs (69%) and encourage their children to pursue an education or career in science or engineering (70%). They feel that they would be able to guide their children in science and engineering in school or when looking for a job (60%).

Most families expect their children to go to college (76%), report never missing a parent teacher conference (72%), regularly attend PTA meetings (70%), and are involved in their child's school (54%).

Few parents do the following activities with their children on a weekly basis: watch science shows (41%), talk about science (38%), read science books (34%), and go to science fairs (11%).

According to parents, most of their children received mostly A's and B's on their school report cards (78%) and in science (72%). Half of the children reported that they have engaged in building and construction activities before joining the BAS project.

Most of the families understand some aspects of the goals of the BAS project (58%). They believe that the goals of the project are to help their children to like science and math, learn about science in fun ways, learn about engineering, motivate children to stay in school, motivate families, etc. As a result of participating in the project, most of them (77%) expect to better understand science concepts and experiments, acquire collaboration skills, be creative, get involved in their children's science learning, and learn to support their children's interest in science. Here is a sample of expectations from parents in their own words:

> "I hope it will increase conversation between me and my son regarding opportunities that are available in engineering."
>
> "This project will increase my knowledge of science."
>
> "My children … will see that I am interested in having fun with science and that will help motivate them."

Most parents (80%) also expect the project will encourage their children to become a scientist and engineer and to think about the future. Here is a sample of quotes illustrating parents' expectations for their children.

> "My child will have a better understanding in science and will probably open more doors in the future."
>
> "It will motivate him to be smart and creative for future science projects."
>
> "It will help them because they will make things they have never done before."
>
> "My child will learn science and may get interested in being a scientist."
>
> "She will become a better learner, be more confident and have a better understanding of science."

Program

Overall, the development and implementation of project materials, recruitment strategies, training, and course activities is well designed and integrated into the project's goals. Based on its theory of implementation and impact, the project's activities are aligned with its short- and long-term outcomes (see Table 2). The program activities such as the training program, family courses, and one field trip, were implemented by the end of April 2011. The production of the promotional and instructional videos is ongoing, and the partners expect to deliver the video in the summer.

Table 2: Be A Scientist! Project Logic Model

INPUTS	ACTIVITIES	OUTCOMES	
		SHORT-TERM	LONG-TERM
Training Program for Undergraduates	16 weeks – University of Southern California 16 weeks - Cooper Union	Engage in a high number of opportunities to apply what they (undergraduates) have learned (e.g., quality of teaching, classroom management, and engaging participants) Interact with high quality opportunities to apply what they (undergraduates) have learned (e.g., quality of teaching, classroom management, and engaging participants)	Improve undergraduates' ability to convey complex ideas to children and families
Family Science Courses	5 weeks – 6 sites in CA 4 weeks - 1 site (New York State Hall of Science)	Improve families' content knowledge Improve families' skills Increase families' interest in science and engineering	Enable families to develop deep science and engineering content knowledge and skills
Field Trips	Support relevant field trips in New York City and Los Angeles	Engage in a high number of opportunities to perform self-directed learning and transfer tasks (families) Interact with high quality self-directed and transfer learning activities (families)	Enable self-directed learning (family) Enable families to transfer learning from the Family Science Courses
Promotional videos	Create 3 videos at one school in CA	Raise families' awareness of the project	Inspire ***new*** parents to realize that science is accessible to them
Instructional videos	Create video of best practices	Expose new teachers to program's best instructional practices	Share widely best practices

BAS leadership completed all of the program activities in a short period of time (January to April) relying solely on a few dedicated staff, volunteers, and partners. They recruited a total of 200 families: 25 families in New York City and 175 in Los Angeles; trained 13 undergraduate engineering students: 1 from Cooper Union and 12 from University of

Southern California; and held a total of 34 family science courses: 4 sessions at the New York Hall of Science and 5 sessions at 6 school settings in Los Angeles.

At the program management level, the implementation process (i.e., how all program components fit together, expected outcomes) was not always clear to all program stakeholders, including program staff, co-principal investigators from partnering universities and museums, graduate students, undergraduate students, parent coordinators, and leaders at participating schools. In addition, there were some staff changes, which created some communication challenges for some partners. Activities often were not planned in advance and key stakeholders were not notified about their participation ahead of time. All of these factors contributed to some disorganization during the implementation process.

Recruitment. BAS staff mounted a successful recruitment campaign in New York City and Los Angeles. To recruit underserved families, they developed selection criteria (e.g., population of free and reduced lunch) and presented the project goals and objectives to parent teacher associations, community-based organizations, and school leaders.

BAS staff has created strong partnerships with public schools in New York City and Los Angeles, the University of Southern California (Film Department, Computer Science Department), Cooper Union (Electrical Engineering Department), and the New York Hall of Science. Partners indicated that the BAS staff have been supportive in the implementation of their portions of the project. Although at the outset BAS staff had some difficulty dealing with logistical issues with certain partners (e.g., securing adequate space for the family science courses), the situation became more manageable as communication improved among project staff and partners. The New York Hall of Science staff provided invaluable support in classroom instruction and management.

Training. Two BAS staff, who have engineering and education backgrounds, led the training of the undergraduate engineering students, which focused on science content, pedagogy, classroom management, cultural sensitivity, and communication strategies. Seven students attended the training held at Cooper Union and twelve students attended the University of Southern California session. The course instructors assisted students in creating lessons, selecting science experiments, and practicing their lessons, and provided guidance and feedback during the family science sessions. However, they could not attend all the sessions because some of the sessions were held at the same time.

Despite this training and preparation, most of the undergraduates were surprised at the high level of classroom management skills required in the informal learning environments. They felt that they were not well prepared to manage their classes, especially during the first two sessions. They discovered that lecturing and asking questions did not generally work well with the families and this age group.

Partnerships. BAS's collaboration with the Museum of Natural History has been limited this year. Museum staff attended the initial project-planning meeting and helped organize one field trip for the families. They plan to offer additional field trips, providing access to informal education science experts and educational collections about animals, bird flight, aerodynamics, and biomechanics of dinosaurs.

To help disseminate the program and recruit new families, BAS is collaborating with the University of Southern California Film Department to create three promotional videos. With the support of their professor, two graduate students filmed five family science sessions at one site and conducted in-depth filming of three participating families (one African-American and two Latino families), following them to their homes and documenting aspects of their lives relevant to the project. They also videotaped the families' field trip to the Museum of Natural History of Los Angeles. They are planning to finalize the production of the videos in the summer.

BAS is also working with a computer science professor and his students (two graduate students) at the University of Southern California to create a video of best teaching practices looking at social interaction, and quality of teaching and teacher effectiveness over time. They plan to conduct classroom behavior analysis on the data collected to identify a set of best practices, which can be evaluated over time. They have videotaped one family science class to date. However, the success of this project component will depend on the following factors:

1. Collecting enough video data
2. Dealing with pre-processing factors such as light and noise, limits of recording tools (microphone, etc.), disk space/memory for online processing
3. Seeking the expertise of educators in labeling the data, determining what's useful from an educational perspective, and helping the University of California computer science team identify various teaching philosophies

Experiences

Overall, parents, children, and undergraduate engineering students in New York City and Los Angeles had a positive experience of the project.

Undergraduates' Experiences. The 13 undergraduate engineering students spent an average of seven hours per week to prepare for the family science classes they plan to teach, which included (a) selecting a lesson topic, (b) creating lessons and experiments, (c) practicing with their undergraduate colleagues, (d) shopping for materials, (e) transporting the materials to the family science site, and (f) setting-up the family science class. They created a total of 28 lesson plans, addressing six topics: energy, transportation engineering, space travel, physics of sailing, physics of amusement parks, and airplane design. Lessons were typically organized in the following instructional sequence: (1) lecture, and (2) experiment (build, test, re-design). There was some variation, however - in New York City, for example, the undergraduate instructor added a third component to the lesson plan: assessment and reflection. According to one of the instructors of this program, the key characteristics of a family science course are hands-on, low cost, and easy to do at home.

Most of the family science sessions were co-taught by undergraduate engineering students, who taught on average 1 hour and 50 minutes per week. Most of the undergraduates felt intimidated and overwhelmed on their first sessions. They did not realize how difficult it would be to manage an entire class with families and young children. Further, some of them missed some crucial project assignment deadlines and did not incorporate critical feedback from their advisers into their lesson plans. Some of the undergraduates did not grasp that this was different a regular undergraduate course.

In addition, there were a number of challenges translating the instructions into Spanish during family science sessions. Translators had difficulty with certain scientific concepts, such as momentum. As a result, some of the families might not have understood some of the lessons. Coordination between instructors and translators was also challenge. Often instructors spoke for a long time, and as a result, the translators who did not take notes were unable to translate all of what was said; in these cases they would ask the instructors to repeat what they had said, translated only part of what was said, or ignore what was said entirely as the instructors move on to the next topic. Other instructional challenges encompass engaging most of the families during the sessions, managing paperwork during the first sessions, managing the large number of program staff and volunteers supporting the lesson, and overloading families with activities and materials. Some instructors missed the opportunity to capitalize on crucial teaching moments by not following up with questions and gathering valuable information about children's and their families' misconceptions about certain scientific concepts. It is important to recognize, however, that the undergraduates were not trained to deal with students' science or engineering misconceptions.

With a lot of support from the course instructors, most of them made adjustments to their lessons and experiments as the sessions progressed. Adjustments were made to clarify of instructional roles (strengths and weaknesses), promote the use of more visuals, include more types of design (e.g., game design), and allot more time to the experiment design and redesign process. The changes helped increase engagement and lessened classroom management issues. While they recognized that it was not an easy class, they appreciated the opportunity to work with the families.

Families' Experiences. Forty-one percent of the families attended all the sessions, while the other families' attendance fluctuated. Attendance was more stable in the New York City project, which held four sessions at one location, than in the Los Angeles project, which held five sessions at six locations. Table 3 shows the number and percent of attendance in Year One of the project. Few of the families in Los Angeles went on a field trip at the Natural History Museum. The field trip was not well attended because it was held on a holiday weekend.

Table 3: Number and Percent of Attendance

Site	Session 1	Session 2	Session 3	Session 4	Session 5	Percent of families at all sessions
Los Angeles	136	132	109	74	63	34%
New York City	26	17	22	21	N/A	73%
Total	162	149	131	95	--	41%

Most parents accompanied their children to the sessions (76%), and were very much involved in building science experiments. They often were so enthusiastic that they took over the child's experiment and made it for them. However, the highlight of the sessions was the building, testing, and redesigning of the experiments. This process afforded children the opportunity to ask a lot of questions about the quality and strength of different materials, and make certain decisions about their design. In most lessons, children asked design and redesign questions: "how can I make my shock absorber stronger, why doesn't my rocket go straight, how to assemble the balloon, what is the foil for, what ball worked better and why, what kinds of wing can we make, why are lighter materials better."

In the current family-child-teacher dynamic during the sessions, the instructional focus seemed to be between the child and teacher, and less on the parents. Since parents and children were being taught the same content and asked to engage in the same science experiments, it would make sense to have parents play a more predominant role in class.

To support family participation, BAS staff required partners to provide a free meal to families prior to each session. Families often took at most 30 minutes to eat their meal. In some cases, the meal took longer and as a result, took precious time from the lesson.

Impact

Undergraduate Engineering Students. Most of the undergraduates did an excellent job working with the families. Here are a set of specific skills and knowledge that they said they acquired as a result of participating in the BAS project:

- Learned how to develop engineering lesson plans.
- Developed better presentation skills.
- Acquired better time management skills by learning how to prioritize their work.
- Developed better communication skills in sharing complex scientific content.
- Learned about leadership (i.e., how to be assertive, how to make decisions).
- Deepened their understanding of the scientific concepts they were teaching about as they try to apply them in the real world.
- Realized that they can be both teachers and engineers.

Parent Outcomes. The parents who participated in the BAS project indicated that they benefitted in the first year of the project through the process of learning and relearning, and building successful experiments. They demonstrated abilities to explore and be curious about science experiments and engineering, and thus, gained from the BAS project in the following ways:

- Learned about scientific concepts, including energy, density, gravity, friction, inertia, and aerodynamics.
- Learned to build science experiments in fun and engaging ways.
- Enjoyed designing, testing, and redesigning their models.
- Enjoyed spending time as a family to learn about science.
- Interacted with other diverse families.
- Realized that how easy it is to make science experiments using everyday objects and materials.

Here are some quotes in parents' own words:

> "It reminded me that science plays a big part in how we live our lives now and how we will live in the future."
>
> "It got me interested in science, I learned lots of things about space travel."
>
> "It allowed for quality time with my family."
>
> "I think participating in this program has affected me positively by helping my student know more. This science program is very helpful."
>
> "This program has affected him in a way where it has help him gain more scientific knowledge."

Child Outcomes. Most of the children were interested and engaged in learning science, enjoyed the learning process, liked to explore different ways to build their experiments, and were comfortable learning in a positive environment. They often remembered what they learned or did the previous week. As a result of their participation in the BAS project, they:

- Began to own their science and engineering learning through the design inquiry process.
- Were proud of receiving their certificate at the end of the semester.
- Kept asking, "When are they [the program staff] coming back?"

Here are some quotes from parents about the impact of the BAS project on their children:

> "She was able to understand a little more about space and science."
>
> "They enjoyed coming and engaging in the different activities. It was very educational."
>
> "They just couldn't wait to come to this science family class."
>
> "This program exposed him to fields in engineering using hands-on activities."

According to the undergraduate engineering students, parents and children learned specifically about energy transfer, water energy, wind energy, solar energy, reflection, absorption, molecules, pressure, aerodynamics, potential energy, gravity, friction, symmetry, angles, propulsion, density, surface areas, buoyancy, lift, shock absorbers, and weight. Here are some quotes from the undergraduates about the impact of the BAS project on participating families:

> "It was interesting to see different kinds of solar ovens with different techniques. Some of their ovens went over 200 degrees F which was amazing."
>
> "The children and families got to learn about the basics of rocket flight and what it means to be an engineer. It was also an experience that they could enjoy working on together, as we saw smiling faces on the parents and kids as the rockets were launched and redesigned to launch further."
>
> "We believe that students grasped … better … the relationship between energy when you save it and when you use it."

Graduate Film Student Outcomes. The Graduate students at the USC film department felt that the project provided an excellent opportunity to practice their skills. As a result of participating in the BAS project, they improved their knowledge and skills about how to cast, film, interact with underserved families and their children, and shape and frame stories about underserved families, science, and engineering. This experience contributed greatly to their workforce preparation.

Conclusion and Recommendations

Overall, the BAS staff and partners completed successfully most of the proposed tasks, including:

- Creating and maintaining successful partnerships with Cooper Union, the University of Southern California, New York Hall of Science, and the Natural History Museum of Los Angeles.
- Recruiting underserved families in Los Angeles and New York City.
- Training the undergraduate engineering students.
- Supporting the implementation of the family science courses.
- Making sure participating families were fed before each session.
- Monitoring families' attendance at each site.

Despite the fluctuation in attendance, most of the underserved families and undergraduate engineering students benefitted greatly from the first year's implementation of the BAS project. As a result of the project, families had access to science content and experiments, which they would not otherwise have access to in their communities. The project exposed families to scientific concepts and the engineering design process (build, test, and redesign) through observation, inquiry, and collaboration. The families found the science activities to be appropriate, entertaining and educational. Further, the project afforded increased social interaction within and across families.

The undergraduate engineering students improved their communication and time management skills, and increased their grasp of the scientific concepts they were teaching to the families. In addition, they developed some leadership skills and an interest in teaching.

As outlined above, the project faced a number of implementation challenges in its first year, including program management, recruitment, training, and instructional issues. Building on the gains the BAS project made this year, we suggest that the recommendations below be taken into account in future project improvement plans:

Program management:

- Make the entire implementation process transparent by sharing the logic model and holding weekly meetings with BAS staff and monthly meetings with the project's partners. These meetings could provide a better understanding of the project's short- and long-term goals, clarify roles and responsibilities around specific implementation tasks, and provide better coordination between program operation, curriculum and instruction, and partners.
- Develop operational plans of the family science program ahead of time and provide clear management and implementation guidance to BAS staff and partners.
- Provide bilingual online instructional resources, including lesson plans and assessment tools.
- Support program trainers by offering them more program development support (creation of syllabus), sharing syllabuses, and providing them feedback on their training and more time to prepare for this upcoming year.
- Provide additional support for the videotaping of the sessions, and the preparation of the instructional materials.
- Develop better strategies in the recording of families' attendance. BAS staff are currently pilot-testing an attendance tracking software with some families in Los Angeles. This pilot initiative seems to be working well.
- Ensure parents' long-term involvement in the program by helping them feel ownership of the project's objectives. The project staff should organize one introductory session for parents at the beginning of the program. The introductory session should explain to parents the vision of the program, collect data from them, and provide them with some strategies about how to help children learn science and engineering. Another retention strategy is to identify the families that attended all the sessions at each site, offer them skill-building sessions, and ask them to take on greater roles and responsibilities as the project matures. The key here is to build a long-term relationship with these loyal families.

- Keep the families involved in science learning and connected to the program after the sessions end, especially during the summer and fall. Staying in touch with the families requires calling via telephone and organizing face-to-face meetings.

Undergraduate Training Program

- Provide opportunities for the undergraduates to practice their teaching skills with the same age group that they plan to teach in the program.
- Help undergraduates figure out how to involve equally parents and children in the lessons.
- Provide undergraduate's mentors with technical expertise
- Help them adjust their lessons while teaching in order to meet the learners' needs. They need to learn to be more flexible and strategic about the information they want to share with the families. They should not just focus on trying to get through their lesson plan without paying attention to how families are reacting to the information being given to them.

Structure of the family science curriculum

1. Lecture using a lot of visuals
2. Design cycle supporting the visual lecture:
    a. Provide a design challenge (teacher)
    b. Provide and explain construction/building materials (teacher)
    c. Brainstorm and select materials (based on own subjective, common sense criteria) (student)
    d. Build artifact (student)
    e. Set up experiment to test artifact with objective testing criteria (teacher)
    f. Test artifact against criteria (structure, performance) (student)
    g. Modify design based on test results in step f (student)
    h. Retest artifact against criteria (structure, performance) (student)
    i. Steps g and h are iterative until testing criteria are met
3. Assessment: Engaging in this process will show how children and their families are curious about how things work, observe carefully, ask questions, solve a problem, think critically, make reasonable predictions, select and use the right materials, build working artifacts, use data to make design decisions, and are opened to feedback and change.

Preparing for the family science class

- Require undergraduates to come 1 or 2 hours before the family science class and explain the lesson to the translator, site manager, and volunteer. This will allow the more effective use of translators, volunteers, and site managers during class.
- Clarify the roles and responsibilities of co-teaching to undergraduate students. An effective instructional model might be to have one student teach the content and explain the experiment, while the other student focuses on classroom

support, management and instructional flow issues. They can alternate their roles and responsibilities.
- Provide microphones to the instructors to help with classroom management.
- Involve parents in classroom set up.

Instruction at family science site
- Clarify roles and responsibilities of program staff and volunteers ahead of time and inform families before starting the lesson.
- Get a sense of what families know about the scientific and engineering concepts you plan to teach them. It is key to deal with their scientific and engineering misconceptions.
- Avoid the use of a lot of scientific jargon and complex concepts.
- Avoid creating a competitive climate during the design and testing process.
- Re-introduce concept maps in lesson plans or other more relevant assessment tools.
- Provide more oversight and feedback to undergraduates during the initial sessions.

Appendix

List of items in Appendix:

1. Parent Consent Form
2. Student Consent Form
3. Staff Consent Form
4. Interview Protocol
5. Teacher Activity Log
6. Parent Survey
7. Student Survey

Education Development Center • Center for Children and Technology
96 Morton Street, 7th Floor • New York, NY 10014-3378
Phone: 212.807.4200 • Fax: 212.633.8804 • TTY: 212.807.4284 •
cct.edc.org

Parent Consent Form

Dear Parent/ Guardian,
Iridescent has contracted with the Education Development Center's Center for Children and Technology (EDC/CCT) to conduct an evaluation of the impact that their Be A Scientist! Initiative has on the experiences of instructors, engineering students, parents, and elementary school students. Education Development Center is a nonprofit research and development organization dedicated to improving the quality, effectiveness and equity of education. The Center for Children and Technology is one of EDC's 20 centers and investigates ways that technology can make a difference in children's classrooms, schools, and communities. We would like you to help Iridescent and EDC/CCT understand whether the Be A Scientist! Initiative is making a difference in your family's science education.

If you agree to participate in this study, you will participate in survey studies once a year. You may be asked to participate in an interview once a year. All information obtained in this evaluation will remain confidential. Your interview statements may be quoted in the final evaluation report, either anonymously or with a pseudonym. The interview may be audio-taped for purposes of maintaining the integrity of our data, but the recording will only be used to support our notes and will be erased at the end of the data collection activities. You will not be identified by name or described in such a way that you can be identified.

The results of the study, and therefore excerpts of interviews, may be presented at scientific meetings and in published reports, with consent from Iridescent, for educational, policy and scientific purposes. We foresee no risks involved with participating in this study. By participating, you may be able to influence the successful implementation of the Be A Scientist! Initiative.

The risks associated with participation in this study are expected to be minimal and not greater than the risks associated with every day life.

Your signature indicates that you have read the information provided above and agree to participate in the evaluation of the Be A Scientist! Initiative. Your signature also indicates that you have agreed to be audio-taped for the purpose of this study.

Should you choose to discontinue your participation in the study, you can withdraw without prejudice after signing this form. However, any information that you have provided to that point will remain part of the study and may be used in later analysis and reports. You may also decide not to answer any questions asked during your interview without prejudice.

If you have any questions or concerns regarding this study please feel free to call Dr. Harouna Ba at (212) 807- 4226 (hba@edc.org). If you have any questions regarding your rights as a participant in this study, you can contact Dr. Alan Stockdale, EDC's Human Protections Administrator at 617-969-7100 x2731 (HumanProtections@edc.org).

Thank you very much for your cooperation.

____

Name (please print or type)

________________________________ ________________

Signature Date

Education Development Center • Center for Children and Technology
96 Morton Street, 7th Floor • New York, NY 10014-3378
Phone: 212.807.4200 • Fax: 212.633.8804 • TTY: 212.807.4284 •
cct.edc.org

Child Consent Form

Dear Parent/ Guardian,
We need your assistance! Your child's school is involved in the Be A Scientist! Initiative. Be A Scientist! Initiative provides an investment of science resources to families in Los Angeles and New York City. Iridescent has asked the Center for Children and Technology (CCT) at the Education Development Center (EDC), a nonprofit research and development organization, to conduct an evaluation of the Be A Scientist! Initiative's. (For more information on EDC and CCT, please visit our Web site at http://cct.edc.org/)

CCT believes that an important vital part of finding out the quality of the Be A Scientist! Initiative is the feedback of those actively involved in it. Therefore, we are asking all instructors, undergraduate engineering students, parents, and elementary school students in your district to take one of our surveys. All the information CCT gets from this evaluation will remain strictly confidential. The information provided by the surveys will help shape the continued growth and improvement of the Initiative.

Your child is invited to participate in the survey study conducted by CCT. If your child participates, s/he will fill out an online survey that takes about 30 minutes to complete. Your child's participation is voluntary. Your decision whether or not to let your child participate will not affect your relationship with his/her school, nor will it affect how your child is treated or the educational services s/he is entitled to receive. If you decide to allow your child to participate, you are free to withdraw your permission and discontinue your child's participation at any time without penalty.

Survey answers from students will be reported as part of a group of answers from a school except for quotes which will be completely anonymous. The results of the study may be presented at scientific meetings and in published reports for educational, policy and scientific purposes. Your child will not be identified by name or described in such a way that s/he can be identified. The risks involved with participating in this study are expected to be minimal and not greater than the risks associated with everyday life.

Your signature indicates that you have read the information provided above and agree to have your child participate in the evaluation of the Be A Scientist! Initiative. Your signature also indicates that you have agreed that your child be audio-taped for the purpose of this study.

If you have any questions or concerns regarding this study please feel free to call Dr. Harouna Ba at (212) 807-4226 (hba@edc.org). If you have any questions regarding your rights as a participant in this study, you can contact Dr. Alan Stockdale, EDC's Human Protections Administrator at 800-225-4276 x2731 or HumanProtections@edc.org.

Thank you in advance for your cooperation.

I give consent for my child (name) ____________________ to participate in this study
Print Parent/Legal Guardian name: ____
Parent/Legal Guardian Signature: ___________________________ Date

Education Development Center • Center for Children and Technology
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Phone: 212.807.4200 • Fax: 212.633.8804 • TTY: 212.807.4284 •
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Staff Consent Form

Dear …
Iridescent has contracted with the Center for Children and Technology (CCT) at Education Development Center (EDC) to conduct an evaluation of the Be A Scientist! Initiative. EDC is a nonprofit research and development organization dedicated to improving the quality, effectiveness and equity of education. CCT is one of EDC's 20 centers and investigates ways that technology can make a difference in children's classrooms, schools, and communities. We would like you to help Iridescent and CCT understand whether the Be A Scientist! Initiative is making a difference in your family's science education.

If you agree to participate in this study, you will participate in survey studies once a year. You may be asked to participate in an interview once a year. All information obtained in this evaluation will remain confidential. Your interview statements may be quoted in the final evaluation report, either anonymously or with a pseudonym. The interview may be audio-taped for purposes of maintaining the integrity of our data, but the recording will only be used to support our notes and will be erased at the end of the data collection activities. You will not be identified by name or described in such a way that you can be identified.

The results of the study, and therefore excerpts of interviews, may be presented at scientific meetings and in published reports, with consent from Iridescent, for educational, policy and scientific purposes. We foresee no risks involved with participating in this study. By participating, you may be able to influence the successful implementation of the Be A Scientist! Initiative.

The risks associated with participation in this study are expected to be minimal and not greater than the risks associated with every day life.

Your signature indicates that you have read the information provided above and agree to participate in the evaluation of the Be A Scientist! Initiative. Your signature also indicates that you have agreed to be audio-taped for the purpose of this study.

Should you choose to discontinue your participation in the study, you can withdraw without prejudice after signing this form. However, any information that you have provided to that point will remain part of the study and may be used in later analysis and reports. You may also decide not to answer any questions asked during your interview without prejudice.

If you have any questions or concerns regarding this study please feel free to call Dr. Harouna Ba at (212) 807- 4226 (hba@edc.org). If you have any questions regarding your rights as a participant in this study, you can contact Dr. Alan Stockdale, EDC's Human Protections Administrator at 617-969-7100 x2731 (HumanProtections@edc.org).

Thank you very much for your cooperation.

____
Name (please print or type)

______________________________ ________________
Signature Date

Interview Protocol

Thank you for agreeing to talk with us about the Cisco 21S School Program. This interview will help us understand how you see the Program and the role that you play in it. All information will be strictly confidential and, where possible, all identifying information will be removed from your responses. This should take no more than 20 minutes of your time.

1. Background.

2. Roles, responsibility in project.

3. Describe the initial Be A Scientist vision, approach, components, and implementation?

4. What did you change in your vision and implementation plans in this first year?

5. What has been successful in the implementation of the Be A scientist in NYC and LA? What are the major impacts of the project in NYC and LA?

6. What has been challenging in the implementation of the Be A scientist in NYC and LA?

7. What solutions would you recommend for addressing these challenges?

8. Is there anything key about this initiative we forget to ask that you would like to talk to us about?

For Program Leaders:

9. We'd also like to know a little about your vision of the future of the Program. Where do you see this Program in five years?

10. Finally, what are some of the long-term changes you expect to see as a result of the Program?

Thank you for your participation!

Teacher Activity Log

1) Teacher Name: ____

2) Date: __________ Class starts at: _______ Class ends at: _______

3) What is the name of today's lesson? _______________________

4) What is the goal for the lesson? ___________________________

5) Please indicate the activities you engaged in to prepare for today's lesson, the time you spent on each activity, and your comments and impressions about each of the activities:

Check	***Activity Names***	***Time on Activity***	***Comments/impressions***
	Personal review of the content of this lesson		
	Personal review of the skills involved in this lesson		
	Set up class before lesson		
	Make copies of materials		
	Create additional materials		
	(list others …)		

6) Please provide a one-sentence overview of what happened in class today: _______________________

7) Please indicate what activities you used in today's lesson, the time you spent on each activity, and your comments and impressions about each of the activities:

Check	***Activity Names***	***Time on Activity***	***Comments/impressions***

8) How much time did your students spend interacting with the provided activities?

9) How much time did your students work during today's lesson?
__Individually __In groups ___ Both

10) What types of questions did students ask?

11) Did you encounter any challenges in implementing today's lesson? Yes___ No___
If yes, please explain: ____

12) Can you share what you think the children and families got out of today's lesson? (Please provide examples supporting your answers.) _________________________________

Parent Survey (Spring 2011)

1) Full name of your child's school: ____

2) Name of Be a Scientist Instructor: ____

3) Relationship to child: __ Parent __ Other (specify): __________________________

4) Are you: __ Male __Female

5) What is the primary language spoken in your home?
__English __Spanish __American Sign Language __Other (please specify)

6) How did you hear about this project? (Select one.)
- __ Participation in another Iridescent program
- __ My child's school
- __ A teacher
- __ The internet, email
- __ A flyer
- __ A friend
- __ Newspaper
- __ Walk by the Iridescent studio
- __ Science Festival
- __ Child mentioned it to me

7) What do you think are the goals of this project? __________________________________

8) How do you think participating in this project will affect you? ________________________

9) How do you think participating in this project will affect your child/children? ____________

10) On your child's last report card, what grades did he/she mostly get? (Please check only one.)
___ Mostly A's ___ Mostly B's ___ Mostly C's ___ Mostly D's ___ Mostly F's

11) On your child's last report card, what grades did he/she get in **science**? (Please check only one.)
___ Mostly A's ___ Mostly B's ___ Mostly C's ___ Mostly D's ___ Mostly F's

12) How would you best describe science, math, engineering and technology jobs/careers?

	1 (low)	**2**	**3 (avg.)**	**4**	**5 (high)**	
Hard to find						Easy to find
Low paying						High paying
Not creative						Very creative
Not cool						Very cool
Not interesting						Very interesting
Not fun						Very fun
Low-travel						High-travel
Not social						Very social
Very difficult/complicated						Very easy/straightforward
Jobs with no impact on the world						Jobs with a big impact on the world
Jobs with no promotion opportunities						Jobs with lots of promotion opportunities
Not challenging						Very challenging
Not secure/not stable						Secure/stable

13) Please read and circle the choice that most truthfully tells how you feel about that statement. (Scale: 1=strongly agree, 2=disagree, 3=uncertain, 4=agree, 5=strongly agree)

Statements	**1**	**2**	**3**	**4**	**5**
I like to watch television programs about science.					
I like to watch movies and pictures of science events.					
I like to visit zoos, museums, etc., to observe things.					
I like to fix things.					
I like to ask questions about a lot of things.					
I like to build things.					
I would like to listen to scientists talk about their jobs.					
I would like to encourage my child to pursue an education or career in science or engineering.					
I would be able to guide my child in science and engineering in school or when looking for a job.					
I think my child will go to college.					
I never miss a parent teacher conference.					
I check my child's grades online.					
I regularly attend PTA meetings.					
I am involved in my child's school.					

14) How often do you do the following with your child/Children)?

Activities	**Never**	**A few times a year**	**At least once a month**	**At least once a week**	**At least once a week**	**Daily**
Read science books						
Talk about science						
Watch science shows						
Go to science fairs						

Thank you for completing this survey!

Student Survey (Spring 2011)

1) Your full name: ____

2) Are you: __ Male __ Female

3) How old are you? ____ years

4) Your school name: ____

5) Date: ________

6) Have you ever done any building/construction activities before? Yes___ No ___

6a) If yes, please draw a picture of your favorite science activity in the box below. Give your picture a title and then write a sentence about the picture.

6b) Write the title of your picture: ____

6c) Finish the sentence. In this picture, I …____________________________________

7) Close your eyes and imagine an engineer at work. In the space below, draw what you imagined.

7a) Finish the sentence. In this picture, the engineer … __________________________________

8) Please read the following to the students and ask them to circle the choice that most truthfully tells how they feel about that statement. Tell them there are no right or wrong answers, we just want their opinion. (Scale: 1=strongly agree, 2=disagree, 3=uncertain, 4=agree, 5=strongly agree).

Statements	**1**	**2**	**3**	**4**	**5**
I like to watch television programs about science.					
I like to watch magic shows.					
I like to watch movies and pictures of science events					
I enjoy collecting different things from the outdoors.					
I like studying science in school.					
I like to visit zoos, museums, etc., to observe things.					
I like to grow things.					
I like to ask questions in school.					
I like to measure things to see how big they are.					
I like to touch different things to learn more about them.					
I like to build things.					
I like to break things.					
I would like to listen to scientists talk about their jobs.					

Thank you for completing this survey!