To: DOE
Susan Borthwick
Kasse Andrews-Weller

From: Ernest Malamud, Executive Director
Olivia Diaz, President of the Board
Janey Cox, Program Coordinator

Subject: DOE Report: SciTech Clubs for Girls

Financial Data

Grants received for SciTech Clubs for Girls:

- U.S. Department of Energy : $30,000 in September of 1991 for two years with a 6 month extension ending funding in February of 1994.
- YouthALIVE: $125,000 in July of 1992 for a three year grant.
- National Science Foundation: $95,000 in November of 1993 to be spent over a period of three years and to match the DOE and YA grants.

Total Grant Funds: $250,000

In kind monies provided by SciTech:

- Donation of $1,500 from IEEE, Chicago Section.
- Donation of fiber optic cable from the Molex Company valued at $2,000, and other material contributions to the projects of approximately $1,000 from various companies.
- Donation of volunteer time and food for the annual girls clubs reception by AAUW valued at $1,500. This highly successful and publicized event brought together girls who had participated during the entire 5-year history of the program.

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- Olivia Diaz' time to provide community liason to find mentors and diversify the groups of girls served and to participate as a leader in the YouthALIVE! network. Her time over the 5-year period is valued conservatively at $40,000.

- Dr. Ernest Malamud's time is donated by Fermilab. His time is devoted to leading and defining the program content, and doing overall financial management. His time over the 5-year period is valued at $40,000.

- 45 women science and construction mentors who volunteered a total of 1800 hours at an average of $25 per hour totaling a donation of $45,000 to date.

- Fermilab has donated a female engineer, Ms. Miriam Bleadon, one day a week to work for SciTech Clubs for Girls. This is valued at $25 per hour for a total of $12,000 to date.

- Grant monies only cover a portion of SciTech's overhead. Approximately $20,000 additional money has been contributed to the program to date from SciTech's general operations budget.

Estimated SciTech contributions to date, both in-kind and local companies: $163,000

Chronology of Events Related to the D.O.E. Grant

- December 9, 1991. Kate O'Connell joins SciTech as the Program Manager (half-time position) for the SciTech Clubs for Girls.

- July 1992. SciTech Board of Directors modifies the SciTech mission statement. (Attachment 1)

- September 10, 1992. Alyce Nogal replaces Kate O'Connell as the Program Manager for the SciTech Clubs for Girls. Position changed from half-time to full-time.

- April 16, 1993 Miriam Bleadon, an electrical engineer at Fermilab joins SciTech Clubs for Girls one day a week as a donation from Fermilab.

- April 26, 1993, Program Manager Alyce Nogal leaves SciTech.
- June 15, 1993, Angie Alleman creates Girls Club Program Manual
- June 25,1993, SciTech hosts 200 Girl Scout for Badge Earning Day
- August 7th,1993, Janey Cox joins SciTech as the Program Manager for SciTech Clubs for Girls.
- October 1993, Board President attends Network meeting in Columbus.
- November 13,1993, SciTech holds the annual reception for SciTech Clubs for Girls (Co-sponsored by local chapter of AAUW)
- December 9th, 1993, Donna Dunlop, Senior Program Officer from DeWitt Wallace- Reader's Digest comes to SciTech for a site visit.
- January 26th to 30th, Lynn Dierking, professional evaluator from Science Learning Inc. is hired for a three year study funded by the National Science Foundation and she visits SciTech.
- March 8th to 12th, Olivia Diaz and Janey Cox attend YouthALIVE network meeting in Miami. Meetings are held with two expansion grantee partners, the U.P. Children's Museum and the National Academy of Science in Philadelphia.

Accomplishments of SciTech Clubs for Girls

Number of Girls Reached

242 girls have participated in SciTech Clubs for Girls since it's inception and have built 38 new exhibits for SciTech with 4 more currently under construction. Of the 242 girls participating, 22 were Latino and 14 were African American which is representative of the cultural diversity in the community. 213 girls came from Girl Scout troops from three local councils; 29 girls came from community and school organizations.

Reception/Reunion

In November, a reception for all of the past participants was co-sponsored by the local chapter of AAUW. Over 250 people attended including families of girls who had been involved, female mentors, and teachers whom the girls had named. Several groups from 1990 attended indicating a long time commitment to SciTech and our program. AAUW members have been increasingly involved at SciTech since the reception. One of the members

produced a video about SciTech Clubs for Girls which is aired weekly on local cable TV. Another member is mentoring an exhibit called Spinners, with a group of girls who built an exhibit in 1990. Two other members volunteered to lead acitivities at our Women in Science Day.

Positive Program Changes

Positive changes that have occured include lengthening the amount of contact time SciTech has with the girls.

- Three groups have returned to redesign and rebuild their exhibit or to make repairs.
- The time that each group spends at SciTech has been lengthened from 6 weeks to 10 to 15 weeks.
- Girls are getting more involved in the design process for their exhibit.
- Girls are also returning to SciTech for special events to act as docents. At a recent Women in Science Day, 4 girls returned to explain and give tours of a Marie Curie exhibit. Another girl volunteered to help us at our annual Halloween party and spent several hours over several days organizing our photograph album.
- Teenage Explainers meet with each of our groups to discuss future employment and volunteer opportunities at SciTech.
- Many exhibits are being built with volunteer exhibit managers (women scientists, engineers or tradeswomen). This has enabled the Program Manager to spend more time on mentor and girl recruiting, exhibit development and project management.

Our strong working relationship with the Girl Scout organization over a 3 county area continues with Badge Earning Days held twice a year at SciTech and recruiting troops for SciTech Clubs for Girls.

We have recently obtained a partnership grant with the DuPage Girl Scout Council from NSF to train Girl Scout leaders how to earn science badges with their troops.

Exhibits Completed from December 1991 to March 1994

Bubble Shapes:

This exhibit was built by a Girl Scout troop from St. Charles. Bubble Shapes illustrates the principle of minimal surface area and consists of three buckets of soap solution and three different shapes. When the shape is lifted out of the solution, the solution collapses to a shape that requires the least amount of energy to be maintained because it covers the least amount of area.

The girls learned about minimal surface area from their mechanical engineer mentor. They learned how bubbles can serve as simple models to help understand how crystals grow, and how scientists have studied bubbles to learn how to build stronger buildings and bridges. They became proficient at using several hand and power tools.

Density Games:
This exhibit was built by a Girl Scout troop from South Elgin. The girls learned about general tool use and safety, as well as weight and density from their civil engineer mentor. This exhibit illustrates the densities of several materials: lead, aluminum, copper, nylon, wood and steel. A block of each material was machined to the same size and attached to a rubber ball handle. By lifting the materials, it can be seen that even though the material is the same size, the weight is different due to different densities.

Electric Fleas:
Electric Fleas was built by a Girl Scout troop from Warrenville. Their electrical engineering mentor taught them about electricity, conductors, and charge transfer. The exhibit illustrates the principle of static electricity. There are bits of stryrofoam under a clear plastic cover. When the cover is rubbed, the "fleas" are attracted to the charge on the underside of the plastic cover.

Energy vs. Power:
This exhibit was built by 8 Latino girls from Aurora. Energy vs. Power illustrates the difference between energy and power. A persons energy is used to turn a hand crank, and is converted into electrical energy by a generator. The electrical energy is stored and is used to turn on lights by the flip of a switch. In the course of construction, the girls learned to solder and use several power tools. Their electrical engineering mentor taught them about power and energy.

Organ Pipe:
Organ Pipe was built by a Girl Scout troop from Carol Stream. This exhibit illustrates how sound waves resonate. By adjusting the position of the pipe and the frequency of the tone, the organ pipe demonstrates where the tone resonates. Their mechanical engineering mentor taught them about sound and air pressure. A construction mentor taught them how to safely use power tools.

Ohm's Law:

A Girl Scout troop from Geneva built Ohm's Law, an exhibit that illustrates that voltage is proportional to current times resistance. They learned the difference between AC and DC electricity, voltage, current, and resistance from their electrical engineering mentor. A female journeyman carpenter taught them about shop safety and tool use.

This group returned to SciTech for a behind the scenes tour of Chicago's Field Museum and to complete repairs on their exhibit.

What is Gravity:
A group of Latino girls from the Chicago Pilsen neighborhood built the What is Gravity exhibit. The exhibit illustrates the principle of gravity by weighting a coke bottle what it would weigh on the various planets. The girls came for an overnight building experience. They arrived at SciTech at 8:30 AM on a Saturday and stayed until 3:00 PM on Sunday. They learned about gravity from their mechanical engineering mentor and a female journeyman carpenter taught them tool use and shop safety.

In the evening of their overnight stay, the girls were engaged in activities that would further their experience at SciTech. They had a treasure hunt that used math, science, and the exhibits on the floor to demonstrate that these topics can be fun. When their exhibit was complete, it was taken to their school as part of SciTech's Discover and Explore program.

Insulation:
The Insulation at Work exhibit was built by a Girl Scout troop from Algonquin and demonstrates how fiberglass insulation works in a house. Their mechanical engineer mentor taught them about heat and heat transfer. They learned about electricity while wiring the heat lamps in their exhibit and learned tool use and safety from a female journeyman carpenter.

The group returned to make exhibit repairs and for a field trip to the Field Museum in Chicago.

Series vs. Parallel:
A Girl Scout troop from Leland built this exhibit with their electrical engineering science mentor and a female carpenter. The exhibit demonstrates the difference between connecting a circuit in series and parallel by showing how the brightness of lightbulbs is affected by the connections.

As part of their introduction to tool use, the girls built two coat racks for the shop to be used by future girls groups.

Remote Manipulator:

The Remote Manipulator exhibit was built by a group of 6 girls from a church group in Wheaton. The exhibit showcases a manipulator donated from Woods Hole Oceanographic Institute in Massachusetts. The girls used power drills, sanders and the band saw to complete the exhibit. Their project manager brought photos from Fermilab and other companies to show the girls how remote manipulators are used in industry.

The girls wrote a script about their exhibit and participated in the video that was made for cable TV.

Jumping Ring:
6 girls from a local low income middle school built an exhibit called the Jumping Ring. This exhibit uses an electromagnetic pulse to propel an aluminum ring 8 feet in the air. At the beginning of their work sessions, the girls visited the Discovery Center in Rockford, Illinois to see a similar exhibit. With the help of their project manager, an electrical engineer at Fermilab, they designed and built the furniture for their exhibit. Volunteer engineers from Fermilab assembled the coil and electrical portion of the exhibit and the girls installed it.

3 of the girls participating in this exhibit are Latino and one is African American. Their school counselor is so impressed with what they have done that she is begging to have more girls participate next year. The girls have been so enthusiastic that we have recruited them for our latest project: Electrical Wiring in the New Light and Perception Area. (see below under current projects) The Jumping Ring was part of a set of exhibits that traveled to a local shopping mall recently for a show. Approximately 60,000 visitors to the mall saw this exhibit built by girls!

Bubble Enclosure:
This exhibit allows the visitor to stand on a platform and pull up on a ring which surrounds them completely in a bubble. The 8 girls from Elmhurst who built the Bubble Enclosure first built a scale model of the project with the help of their exhibit manager, a formal naval weapons trainer. They made a materials list and visited the lumber yard to order materials and observe them being cut to their specifications. During the 8 weeks that the girls were here, they learned to use the power drill and sander, and a physicist taught them about the science of bubbles.

Torsion Wave:
This group involved a Cadette Girl Scout troop (5 girls ages 14-16) working with a Junior Girl Scout troop (7 girls ages 9-13) both from Woodstock. The exhibit that they built demonstrates wave motion. Their science mentor, a sound engineer, taught them about frequency, standing waves and wavelength. Models of the Torsion Wave were built with straws, paperclips and tape so the girls could take a wave home with them and demonstrate what they had learned. The

Torsion Wave extends thirty feet into the air and attaches to the ceiling at SciTech. The girls chose a rainbow pattern of colors to paint the 92 horizontal rods which hang on cables.

Coax Vs Fiber:
6 girls from an Oswego Girl Scout Troop built an exhibit demonstrating the difference between coaxial and fiber cable. The girls studied existing exhibits at SciTech to get ideas of how their exhibit should look. They built a scale model with their exhibit manager, an electrical engineer. They wrote a letter to the president of Molex and solicited a donation of cable. They assembled the furniture and applied a laminate to it. They placed a camera, monitor and the cable in the exhibit and labeled it for viewing by the visitor. They wrote a very detailed script explaining the process of building their exhibit and they participated in the video for cable TV.

3D Shadows, Stereovision:
This group of 7 girls from Batavia began their involvement at SciTech by helping us better organize the Girls Clubs shop area. They labeled and inventoried all of the tools and materials. Both of the exhibits they built involve visual perception and they spent a great deal of time experimenting with different visual tricks. They learned how to cut glass and make picture frames for the random dot stereograms. They used the power drill and sander to construct the table and screen for the 3D Shadows exhibit.

Trapezoidal Window:
The Aurora YWCA provided a group of 6 girls who built the trapezoidal window. The girls learned about visual perception from demonstrations by a neuropsychologist from the Illlinois College Of Optometry. Their construction mentor, a mechanical engineer from Fermilab instructed them on safe use of the power drill and sander. They learned how to score and paint plexiglass in a very precise manner. The group acted as docents for a Marie Curie photo exhibit on SciTech's Women in Science Day. They live close to SciTech and often drop by on Saturday mornings to "visit" their mentor.

Bernoulli Levitator:
A local church provided a group of 5 African American girls to build the Bernoulli Levitator. They learned how the Bernoulli effect allows airplanes to fly. They were taught how to solder and one of the girls did the soldering for the exhibit. The Bernoulli Levitator was built from scrap materials that they drilled and hammered together. They researched at the library about the Bernoulli effect so they could communicate with visitors on the exhibit sign. With the aid of their exhibit manager, an electrical engineer, they wired the motor for the blower.

Bubble Sheet:

8 girls from a Cary Girl Scout troop participated in building the Bubble Sheet. They built small structures with straws and studied how bubbles are formed with their science mentor, a physicist. They ordered the materials for the exhibit and cut and glued all of the PVC parts together.

Truss Bridge:
The Quad Counties Urban League's Tomorrow's Scientists, Technicians and Managers (TSTM) program provided 10 African American girls to build the truss bridge. The girls studied an existing small scale take apart truss bridge to understand how theirs would be constructed. Their exhibit manager, a journeywoman carpenter, led them in the construction of a pedestrian scale truss bridge which leads visitors into the museum.

Exhibits Currently Under Construction:

Currently 3 exhibits and one electrical wiring project are under construction. The exhibits are:

Spinners:
A set of three exhibits on visual perception involving 5 girls from a Girl Scout troop from West Chicago who originally built this exhibit in 1990. Date of completion is May 31st, 1994.

Piano String:
An exhibit using the inside of a piano and a strobe light to stop the motion of the strings as they are vibrated. 4 Latino girls and 2 others signed up to build the exhibit following an article in a local newspaper. Date of completion is May 31st, 1994.

Wind Power:
This group of 5 girls, also recruited through a newspaper article, have been meeting with their exhibit manager, a mechanical engineer, since December of 1993. Their task is to design an exhibit using wind generators to power an electric train. Their design is completed and has been approved and now they are in the process of building the exhibit. Date of completion is May 30th, 1993

Electrical Wiring/Painting/ Kiosks in the Light and Perception Area:
5 girls who have already built the Jumping Ring exhibit and three girls recruited from local high schools will work with a female licensed electrician to install wiring and electrical outlets and light fixtures for a new exhibit space for SciTech. Various girls from the local community who have already built exhibits for SciTech will work to build kiosks and paint the new exhibit space. Date of completion is May 30th, 1993.

Evaluation

Science Learning Inc., a professional evaluation firm from Annapolis, Maryland, has been hired to complete a three year study of the impact of SciTech Clubs for Girls. Through case studies of selected groups, personal interviews with participants and surveys, SLi will assess several factors involving the girls. They will be looking at how or if the program affects self esteem, confidence and interest in math and science, test scores and career choices. Lynn Dierking has been assigned to the project and has written a preliminary report from her first visit. (See Attachment A) This study has been funded through a grant from NSF.

SCIENCE LEARNING INC.
MUSEUM EXPERIENCE ASSOCIATES
a non-profit educational corporation

MEMORANDUM

3 March 1994

TO: Olivia Diaz & Janey Cox
SciTech

FROM: Lynn Dierking
Science Learning, inc.

RE: Initial Visit to SciTech

I wanted to follow up my initial visit to SciTech with some thoughts about the project and some plans for the evaluation. First of all, let me tell you both how much I enjoyed my visit--it is one thing to read about a project on paper, quite another to see it action. The dates for the visit could not have been better, enabling me to observe two "Clubs for Girls" group sessions; one on Wednesday evening for two hours and the other Saturday morning for two hours. What was most interesting about these groups was that the Wednesday group of three girls and a group leader had participated in the program as 4th graders and were now returning as 8th graders to participate again; all but one of the three girls in the Saturday group were new to the program and meeting for the second time. Observing these two different groups was extremely useful in raising some of the issues that will be important in this evaluation. Having a repeat group there provided some interesting perspective on how a program like this might impact participants.

I was also able to interview three 11-year old girls from the Thursday afternoon group who arrived early for their session. For about 20 minutes we spent time exploring different exhibits together and talking about the program, their interests and whatever else they were interested in discussing.

Based on the data collected during these experiences, as well as the opportunities I had to talk with staff and volunteers over the four days, these are some of SLi's initial observations:

*A critical component of this evaluation of impact will be a broadened perspective on outcomes. What I was observing were opportunities for girls who like science and math to find friends with common interests, and an environment in which they are encouraged to take risks, make mistakes, get dirty, all while working on a focused project with a science and/or construction mentor with a definite goal and real end product in mind. It will be important for us to consider as an outcome, such changes in girls' attitudes and behavior as

decision-making and risk taking, as well as an increase in the number of science courses they are taking or career decisions.

*The Wednesday evening group provided some perspective on how the program is both impacting girls, but also group leaders. The group leader attending on Wednesday was the same leader who had brought the girls four years earlier, when they were 10-year olds. Without asking her directly, she offered in conversation that the program had strongly influenced her as a troop leader, opening up possibilities for more interactive troop activities and science investigations. In another project with which SLI was involved, we observed a similar tendency for middle-aged women (of diverse backgrounds) to become empowered when programs were actually designed with their children in mind. It occurred to us in this other project in which the science leader was herself a middle-aged woman that actually she was serving as a role model not only for the children, but also for the mothers, one with which they strongly identified. This may also be a factor at SciTech and will also be a critical "outcome" to look for and document in other groups. Since the troop leader has interactions not only with the girls participating in the program, but also with the rest of the troop, it will be important to talk to other troop leaders and Girl Scout Council personnel to determine if there is a sense of SciTech's "Clubs for Girls" project having such an impact on troop leaders and the activities of their troops.

*This group leader also provided some additional food for thought regarding the nature of impact. The group leader said that the science teacher at the girls' elementary school had commented that this subset of girls always made their science fair entries interactive, providing opportunities for "visitors" to test with litmus paper themselves, for example, rather than just showing the results. The science teacher wondered what kind of science experiences she was providing this group of girls during troop meetings. The possibility that the experiences provided by SciTech four years before, and later reinforced by a more science-empowered leader, might have led to an improved interactive presentation of science fair projects might be another important topic to discuss with girls, leaders and science teachers as we assess impact.

*All of the girls in the three groups I observed during my visit were excited about returning. It was also clear either through direct contact with parents, or through conversations with the girls, that this program was perceived as being extremely important to their parents. Two mothers, one the group leader above and the other a mother bringing her daughter quite a distance on Saturdays to attend this program, indicated that they weren't the "science type" and that this program provided an opportunity for their daughters to be encouraged in science. One father, an engineer, picking his daughter up on Saturday, chatted for quite a while with the

science mentor and looked and listened while his daughter shared her science journal with him. The two Hispanic girls and one African American I interviewed Thursday afternoon indicated that "their moms wanted them here." Talking to parents and guardians, guidance counselors, teachers and other significant adults will be an important aspect of assessing impact.

*In both of the group sessions I observed girls were very excited about what they were doing, were very involved with the activities, optical illusions on Wednesday & sound muffling on Saturday, and "on task" up until the very end of the sessions. On Wednesday evening, the science mentor brought in a variety of optical illusions, in addition to the ones SciTech provided, and a mechanized "spinning wheel" that the girls operated and experimented with themselves. Because their original exhibit four years before was also related to optical illusions, there were opportunities for the girls to relate this new information to the previous experience; throughout the session there were comments such as, "We did this one," referring to the experience four years earlier. They were even able to use part of the exhibit they had built previously ("Red Parrot, Green Parrot") for part of the lesson and enjoyed looking at their handwriting on the back, as well as understanding the underlying principles in a way they had not before. The Saturday group spent their two hours problem solving and trouble shooting, in a relaxed and informal sort of way, as they tested model trains for their exhibit on electricity and experimented with the best possible ways to "muffle" the sound of a leaf blower which will be used to power the train in the final exhibit. The science mentor, an engineer, encouraged the girls as they took train models apart, decided whether it would be better to use a large or small model train in the exhibit and determined the best way to muffle the sounds of the leaf blower. Because there were a variety of materials available and a knowledgeable and most supportive mentor, the girls were constantly challenged to "try it out." I was struck by the fact that girls in this program have the opportunity to work as a team of scientists, taking on specific tasks and working together toward a common goal. The Saturday group took on this challenge wholeheartedly, creating some complex systems for sound muffling and enjoying themselves at the same time. They were quite knowledgeable about sound and how it travels and they seemed to enjoy taking that knowledge and applying it to the problem solving situation at hand. Trying to determine whether this project is indeed providing some real world opportunities for building on previous knowledge should also be something that we probe in the impact study as well.

*Despite the fact that the girls in the Saturday group were a group composed by SciTech, they obviously had bonded somewhat the week before and by the end of this session they were calling out to one another by name. They were also concerned

at the beginning of the session that one girl was missing, "Where's Janet?" One mother even commented upon picking up her daughter that she saw this program as an opportunity for her daughter to interact with other girls that have similar interests; "her troop is more involved with sports and 'girl things;' she does not have many friends that share her interests." The Wednesday evening group knew one another well outside of the SciTech experience but it was also clear that the resulting social interaction, both between participants, and between participants and mentors, is an important feature of the program. The girls that I interviewed on Wednesday all knew one another from school; two of the girls (the two Hispanics) were "very good friends." They also were quite comfortable with one another, and enjoyed going from exhibit to exhibit together, experimenting with the different interactives. I did not get to observe their session but will continue to explore the role of social interaction and identity as I observe and talk to groups in the future. It is quite possible that the social nature of the program, with the opportunity for girls to find others with common interests, plays a role in building the self esteem of girls at a critical time in their development--we should be sensitive to those types of outcomes as well.

*One other issue came up in my conversation with the three girls on Wednesday afternoon which I think is very relevant to the program and its impacts on girls. One of the girls commented when I asked about a school book she was carrying, "Oh, that's my social studies book. I like social studies more than I like science." Immediately she was embarrassed for saying that, given where we were and what she was doing at SciTech. In probing a bit further it became clear that she does not like science because "it's boring...all we do is read aloud together, fill out worksheets and take tests. I like social studies because we work on projects and do fun stuff." This was the very girl who seemed exceedingly bright, led the way to each new exhibit and was usually the quickest at determining the point of the interactive. An important role that "Clubs for Girls" can play then, is to not only improve girls' attitudes towards science in school, but in situations in which school science is reinforcing a negative attitude, provide an alternative experience and view of science. This is an aspect of the program SLi will also continue to explore in its impact study. Talking to science mentors and girls about these issues, as well as continuing to observe groups when possible, will be critical.

A few additional thoughts about the evaluation:

*As I was suggesting to both of you in Aurora, after observing the program in action, I think that it will be more useful to develop case studies around a group of girls, rather than around individuals. It will enable us to look at a whole array of outcomes, across a group of girls. We can also

include data about group leaders, parents, teachers, etc. which should provide a broader perspective on the experience. We would propose four such comprehensive case studies; perhaps two of groups you feel were or are succeeding and two groups that have had or are having difficulties. I know that expanding the ethnicity of groups has been a focus of late, so factor that into your suggestions of case studies. We will take all of that into account when we make the final selection.

*To complement these qualitatively rich case studies, we want to also collect other data across as many girls who have participated in the program as possible. Tracking such variables as the number and type of science courses taken, grade point average, school attendance, participation in science & technology fairs or other science-oriented experiences, outside reading or TV viewing related to science, etc. represent some of the possible variables. We would also like to administer at least one self-esteem scale to those girls who join the program in the next two years; we will administer that same scale to them prior to completion of the evaluation to assess any changes that might have occurred. This portion of the summative evaluation/research project would be strengthened by some control group data. I hope that SLi can work with SciTech and the local Girl Scout Councils to identify some possible control groups.

*We are continuing our literature search and efforts to see how other comparable projects have been assessed around the country and will feed any relevant information into the evaluation plan. There is no reason to re-invent the wheel or narrowly focus our efforts.

Let us know what you think of these ideas and plans. If you can add anything based on your observations please do communicate those to us. Regards.

You are cordially invited .....

...to SCITECH CLUBS for GIRLS

Annual Reception

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18 WEST BENTON STREET
AURORA, ILLINOIS
PH. 708-859-3434

Museum club makes math, science fun

■ **Aurora:** Angela Moore's job on the Bernoulli Attractor at SciTech was to sand a piece of plywood.

Angela, 10, lives in Aurora. She is a member of the Club for Girls at SciTech, an organization that promotes the learning of science and math by young girls by teaching them to build exhibits. SciTech is an Aurora museum known for its interactive and hands-on displays.

The Bernoulli Attractor, overseen by Mimi Bleadon, an electrical engineer from Fermi National Accelerator Laboratory, will take about six weeks to build, with the girls spending a few hours working on it each week.

The project will show the dynamics of air flow, or why an airplane flies. The girls are building an exhibit that will levitate a piece of plywood with a big air blower.

Bleadon said she enjoys working with the girls and acting as a role model for them. "I hope it will open up a whole new set of opportunities for them," she said.

The program to introduce girls to science and math through building projects and learning from local professionals is in its fourth year, said Olivia Diaz, acting manager of SciTech Clubs for Girls.

"The girls range in age from 9 to 13," Diaz said. "Our mission is to reach people who are underrepresented in math and science careers, and of course, females are one of those big groups."

Tribune photo by Gerald West

Mimi Bleadon, an electrical engineer from Fermi National Accelerator Laboratory, works with a girl on a project at SciTech.

The program was originally funded by the Illinois State Board of Education Center on Science Literacy, she said, then picked up by the U.S. Department of Energy for two years.

Recently, a group of girls from the Urban League in Aurora built an exhibit of a truss bridge.

Two upcoming projects will have groups assembling an arobotic arm and working on a coaxial-cable project, Diaz said.

S.R. Carroll

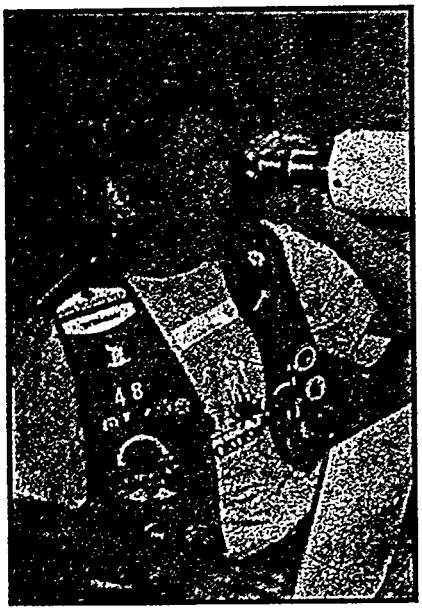
D Chicago Tribune, Tuesday, August 3, 1993 Section 2 3

Girl Scout
Sybaquay Reporter
Nov. '93

Girl Scouting's World of Today and Tomorrow: Exploring Science

According to several recent surveys, girls in school are often discouraged from excelling in math and science. Yet these subjects are extremely critical, especially in today's technological society. Understanding mathematical equations, measuring atmospheric pressure, and using a computer all require analytical thinking that leads to greater problem-solving skills, decision-making abilities, confidence, and career opportunities. This view is supported by experts, who agree that in order for girls to enter adulthood properly prepared for success, they should be given more opportunities to develop skills in math, science, and technology.

In Girl Scouting, this need is met through a supportive all-girl environment where girls can earn badges like "Science in Action", "Math Whiz", "Aerospace", and "Computer Fun"; and such Try-its as "Space Explorer", "Math Fun", and "Science Wonders".



Discovering science at SciTech.

Junior Girl Scouts experiment with water displacement.

Many Girl Scout activities are designed to link math and science to the every day lives of girls, making these subjects more accessible and more fun.

Recently, Sybaquay Girl Scout Council offered an opportunity for Junior Girl Scouts to discover the world of science. On September 11, 1993 "Science Makes the World go Around" was held at SciTech, a hands-on science museum in Aurora. Ninety Juniors spent the day working on badges, experimenting with the fascinating exhibits at SciTech and discovering the wonders of science. The girls earned two badges, the "Dabbler in the World of Today and Tomorrow " and "Science in the Worlds". Activities included testing foods for fat and oil content, fingerprint analysis, exploration of water displacement and bubbles, learning about women in science , and exploration of the over 150 displays at SciTech.

Sybaquay Girl Scouts have also had opportunities to be a part of building the displays at SciTech as part of the SciTech Club for Girls. During the process the girls meet with a woman who is employed in the science field and she gives them information about the display they will build as well as career information. The next step is to meet with a female representative of the construction industry to learn about tool safety. The girls give input into the design of the display and then assemble the display. This process takes a troop approximately six weeks. To date we have had six Sybaquay troops take part in this program. A seventh troop, Cadette Troop 305 from Woodstock begins preparing a new display this month.

According to a National Science Foundation survey, achievement in math and science directly correlates with early learning experiences. Girls need confidence and the ability to excel in an increasingly science-based culture. Programs such as those at SciTech, provide girls with the technological skills and knowledge needed to succeed in our society, today and tomorrow.

Women, girls groups make new exhibits for SciTech museum

The Beacon News 12/3/93

Aurora

The following exhibits were built by girls and women's organizations for the SciTech museum, 18 W. Benton St., Aurora.

Ohm's Law: Brittany Landsberg, Lisa Bassett, Molly Bastian, Becky Vander Bieze, Erin Jackson, Theresa Sullivan and Ellen Bassett, from Girl Scout Troop 407 in Geneva.

Inverse Square: Rachel Aldergott, Lindsay Blindt, Lori Balsitis, Heather Irwin, Shelly Savino and Heather Walkening, from Girl Scout Troop 1049 in West Chicago.

Truss Bridge: KoRonna Johnson, Jessica Robinson, Shera Pipkin, Jasmin Bowling, Suntress Slater, Tellly Anderson, Kathy Weathers and Janay LeShon Melvin from the TSTM Urban League in Aurora and Bolingbrook.

Coax Vs. Fiber: Katie Hastings, Kate Palm, Katy Ruppel, Melissa Neitzel and Melissa Homerding, from Girl Scout Troop 421 in Oswego.

Bernoulli Levitator: Yvonne Miller, April Latrice Jackson, Angela Moore, Juanita Harrell, and Jacelyn Harrell from Aurora.

Visual Perception I Shop Organization: Erin Best, Rachel Dunsmoor, Jenny Edwards, Melissa Hageman, Beth Hamilton, Michelle Schumpert and Robyn Weigand, from Girl Scout Troop 404 in Batavia.

Bubble Shapes: Mary Brunner, Stacy Brunner, Stephanie Kupowski, Krissty Averette, Heather Kramer, Katherine Cummins and Anne Knudsen, from Girl Scout Troop 109 in Elgin and St. Charles.

Electric Fleas: Alice Weidner, Linda Herwaldt, Kristen Kosidowski, Michelle Martin, Katie Herwaldt, Annie Weidner and Traci Jonas, from Girl Scout Troop 305 in Aurora, West Chicago and Warrenville.

Energy Vs. Power: Carmen Rios, Edith Martinez, Monica Martinez, Jessica Vasquez, Viola Adams, Imelda Nunez, Amber Navar and Amy Navar, from Girl Scout Troop 242 in Aurora.

Art of Vibration: Lora Schreiner, Anu Bamzai, Rebecca Wickham and Johanna Canniff, from Girl Scout Troop 431 in Naperville.

Image Wand: Julie Depki, Lidsay West, Beth Nagel, Heather Beck and Jessica Mueller, Girl Scout Troop 972 in West Chicago.

Benham's Wheel: Tanya Austin, Kelly Kaylor, Alissa Watson, Leslie Harlson and Elizabeth Patterson, from Girl Scout Troop 936 in West Chicago.

KAREN KERCKHOVE / THE BEACON-NEWS

Michelle Schumpert, 11, of Batavia, shows one of the museum's exhibits, on how sound travels, to her friend Stephanie Feft, 11.

Not just for boys

SciTech club shows math and science can be girls' domain, too

By Michael Harrison
COPLEY NEWS SERVICE

Aurora

Math and science opportunities aren't just for boys, a group of 220 area girls is proving.

They are members of the SciTech Clubs for Girls, an organization that has built some 30 exhibits for the hands-on science museum located at 18 W. Benton St. in downtown Aurora.

The goal of the clubs is to promote an interest in math and science and build self-esteem, says Janey Cox, program coordinator.

"Statistics have shown us that girls are very under-represented in math and science careers, whereas boys are quite well-represented," Cox said. "Our part is to encourage more involvement and more education in math and science throughout their high school careers."

The club is for girls ages 10-14. They meet with women experts employed in the science profession

"We're thinking about the future and how we can continue this program without grants..."

JANEY COX
PROGRAM COORDINATOR, SCITECH CLUBS

fields who offer their expertise for building exhibits, Cox said.

"They usually donate their time, which is really nice," Cox said.

The club was formed four years ago by the president of SciTech's Board of Directors, Cox said.

The club consists of girls from 22 Illinois cities, including Aurora, Naperville, Elgin, Oswego, Geneva, Batavia and St. Charles.

Co-sponsored by the Aurora chapter of the American Association of University Women and SciTech, a reunion and reception was held Saturday at SciTech to celebrate the four years of existence of the clubs.

Current funding for the program comes from three grants, Cox said. They include a two-year $30,000 grant from the U.S. Department of Energy, a three-year $90,000 grant from the National Science Foundation, and a three-year $125,000 grant from the DeWitt Wallace Readers Digest Fund.

"It's been a real popular program," Cox said. "It's easier to get money for this than it is for operation of the museum. We sort of started it on our own without having a grant, and it mushroomed from there."

But the grant funds won't last forever, and private donations may have to be raised for the program, Cox said.

"We're thinking about the future and how we can continue this program without grants," Cox said. "We definite-

Fox Valley Sun - 11/18/94

SciTech club proves math, science is not just for boys

By Michael Harrison

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"We're thinking about the future and how we can continue this program without grants," Cox said. "We definitely would like to continue (the program)."