

OPENING MINDS TO SCIENCE

The Saint Louis Science Center's Report to the Community



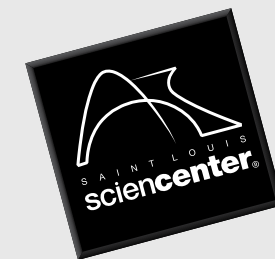
2007-2008



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Unless otherwise noted, all photos by the Saint Louis Science Center.

From the Senior Vice-President and Associate Director of the Museum, Carol Valenta

Dear Partners in Science Education,

I am pleased to present the Science Center's second annual report on our programs, *Opening Minds to Science: The Saint Louis Science Center's Report to the Community, 2007-2008*.

We are gratified by the positive response to our first report, both from our stakeholders and partners and from the informal learning community. Museums and informal learning institutions currently are wrestling with how to effectively measure and demonstrate the ways in which we make a difference in the lives of our visitors and communities. We are committed to engaging in and furthering this conversation. Based on our past work in assessing the Science Center's impact on program participants, we have developed a new system to measure impact that will debut in 2009.

We are also engaged in discussions with colleagues in the informal learning field to develop models for measuring impact. These collaborations broaden our thinking and helps us work more effectively. As you read this report, you will see a strong theme of partnerships; three of our four spotlighted programs involve working with regional and sometimes national partners.

In this report we use both quantitative and qualitative methods to communicate the experiences of participants in our programs. In addition to statistics, you will hear the voices of our audience; their words speak very compellingly to the ways in which our programs are shaping their experiences with science.

We hope that you will find this report useful to your work. We look forward to your feedback and to continuing a conversation about how we can work together to open minds to science.

Sincerely,



Carol Valenta
Senior Vice President and Associate Director of the Museum
Saint Louis Science Center



Carol Valenta
Senior Vice-President
and Associate Director
of the Museum

CONTENTS

Open Every Mind to Science	1
The Saint Louis Science Center’s educational philosophy and practice.	
Methodology	3
How the Science Center collects and analyzes data describing our programs.	
Overview of Programs at the Science Center, by Department	5
Analysis of programs as a whole, as well as by individual department.	
Challenger Learning Center-St. Louis	7
Community Science Department	8
Public Programs Department	9
School Programs Department	10
Science & Galleries Department	11
Program Spotlight	12
More in-depth analysis of the experience of participants in four Science Center programs.	
<i>Challenger Learning Center Student Missions</i>	12
<i>MySci™</i>	15
<i>Nanofuture Forums</i>	18
<i>Travel Programs</i>	21
Looking to the Future	24
Appendix	26
Sources	28

OPEN EVERY MIND TO SCIENCE

The Saint Louis Science Center’s Educational Philosophy and Practice

The Saint Louis Science Center is a free-choice, informal learning environment where people of all ages engage with science – directly and on their own terms. We seek to engage the broadest audience possible through programs designed for: families, school groups, educators, teens, community organizations, adults, and the general public visiting the Science Center.

Our mission is to ignite and sustain lifelong science and technology learning.

Opening Minds to Science

Our exhibitions and programs take into account the complete visitor environment – physical, social, and personal. We believe that learning is best fostered through programs and exhibitions that encourage visitors to:

- make personal connections to their knowledge and experiences
- embrace a spirit of play and discovery
- act on their own curiosity
- form and ask questions
- engage in hands-on exploration and experimentation
- cultivate science process skills
- pursue science throughout their lives

Positive experiences with Science Center exhibitions and programs will encourage repeat visits and prompt visitors to interact with science beyond their visit. Ultimately, we hope to motivate our visitors to think differently about science and to empower them to make informed choices in their everyday lives.

Learning in an Informal Environment

Free-choice learning “tends to be non-linear and personally motivated.” (Falk and Dierking, 2000, p.13) In designing our programs and exhibitions, we strive to provide multiple levels of interaction and engagement for diverse audiences. This translates into experiences that are accessible, multi-sensory, and meaningful to people with a variety of abilities, cultural backgrounds, experiences with science, learning styles, and interests. We also seek to support social learning, experimentation, and investigation. We believe visitors should have fun, engaging, relevant, and successful experiences with science, whatever their level of knowledge. Science Center staff play a key role in fostering a successful experience.

How We Develop Exhibitions and Programs

In order to develop exemplary exhibitions and programs, we ground our processes in best practices in the field, current science content, current learning theory, and audience research. Clearly articulated educational goals and objectives drive the exhibition and program development process. As appropriate, we correlate our offerings to national and state curriculum standards. Through front-end, formative, and summative evaluation, we include our audiences and other stakeholders in the program and exhibition development and revision process.

In developing these experiences, we seek to communicate clearly how we envision visitors engaging with them, employing devices such as advance organizers and tools to personalize the experience. We take risks with cutting edge content, ways to deliver that content, and ways of including new audiences. The Science Center supports these processes with adequate time, funding, and staff.

Exhibitions at the Saint Louis Science Center capitalize on the power of three-dimensional environments to engage our community with science. Our exhibitions must engage a broad spectrum of visitors. We recognize that every exhibit component cannot meet all the needs of all our audiences, but we seek to create a balance of experiences within the exhibition as a whole.

We commit to developing exhibitions that:

- Provide multiple conceptual entry points and multiple outcomes.
- Are current and can be adapted to stay current.
- Facilitate conversations and encourage multiple groups to engage with each other.

Programs at the Saint Louis Science Center engage our community with science via skilled, well-trained program developers and presenters. Often developed based on the needs of specific audiences, programs both expand on conversations begun in our galleries and incorporate topics and experiences beyond the scope of our galleries. Consequently, programs increase our audiences' engagement with science and broaden the Science Center's impact. Programs also increase the size and diversity of our audience and generate revenue crucial to our ongoing work.

We commit to developing programs that are:

- Learner-centered.
- Delivered by knowledgeable and well-trained presenters.
- Facilitated in a manner that actively matches content and delivery to the needs of the current audience.

Thoughtful planning supports our exhibition and program development process. A focused and fiscally sound plan, based on this learning philosophy, addresses each of our audiences and content areas. A review process allows us to monitor our impact and track our success toward opening minds to science.

METHODOLOGY

Since 1997, the Saint Louis Science Center has collected information about the experience of participants in our programs through the **Better Education and Revenue Through Tracking (BERTT)** system. The BERTT system collects and summarizes key performance indicators for Science Center educational programs.

At the Science Center, we define programs as, "staff-led interactions scheduled for a specific audience with written educational goals and objectives."

BERTT tracks the following elements related to program performance:

- Average length of a program
- Number of times offered
- Number of interactions (individual's participation in a program)
- Total hours of interaction
- Average mission, satisfaction, and interest ratings by participants (each on a four-point scale, with four as the highest rating)
- Measure of impact on participants (ten-point scale, with ten as the highest score)

Program staff distribute response cards to a sampling of program participants. Visitors are invited to respond to the following questions:

- "Did you, or others in your group, discover something interesting from the activity today?" (**Mission Question:** Measures how well the Science Center is accomplishing its mission of igniting and sustaining lifelong science and technology learning.)
- "How satisfied were you with this program today?" (**Satisfaction Question:** Measures how satisfied participants are with the program.)
- "How much did previous Science Center experiences influence your decision to participate in this program?" (**Interest Question:** Measures the influence of past visits on the decision to participate in program.)

Participants are also asked to respond to the following open-ended question:

- "What was the highlight of your experience in this program today? Why?" (**Highlight Question**) The open-ended responses to this question are coded for analysis, based on the level of specificity of the comment.

A version of the response cards with child-friendly language is distributed to participants under the age of 14.

Program staff enter the responses into a shared database. This database allows the Research & Evaluation Department to calculate average length, interactions, and participant ratings for specific programs, departments, and Science Center program offerings as a whole. This information is analyzed and presented in monthly, quarterly, and end-of-year reports, in addition to this annual report to our community stakeholders.

Defining and Measuring Impact

On an individual level, impact results from a Science Center offering that enables a participant to make personal connections between the content and experience of the offering and their own knowledge and experiences.

In the short-term, this is illustrated by a change in knowledge, understanding, attitude, interest, or enjoyment. Over the long term (months to years), this is illustrated by an incorporation of these changes into participants' lives. The larger effects of these long-term individual impacts are felt within the Science Center and throughout the broader communities of which the Science Center is a part.

The impact score provides a numerical way to represent the impact that participation in a program has on an individual. The mission, satisfaction, and interest ratings, as well as participants' responses to the highlight question, contribute equally to the calculation of the impact score, which is reported on a ten-point scale.

In addition to the ongoing program measures collected and reported on a monthly, quarterly, and annual basis, the Science Center also conducts more in-depth evaluation of selected programs. Periodically, the Science Center contracts with external evaluators to conduct front-end, formative, and summative evaluations on specific programs. This report contains findings from both internal evaluations conducted by the Science Center's Research & Evaluation Department as well as evaluation studies conducted by external evaluators. Unless otherwise noted, data and findings originate from the Research & Evaluation Department.

OVERVIEW OF SAINT LOUIS SCIENCE CENTER PROGRAMS

September 2007 to August 2008

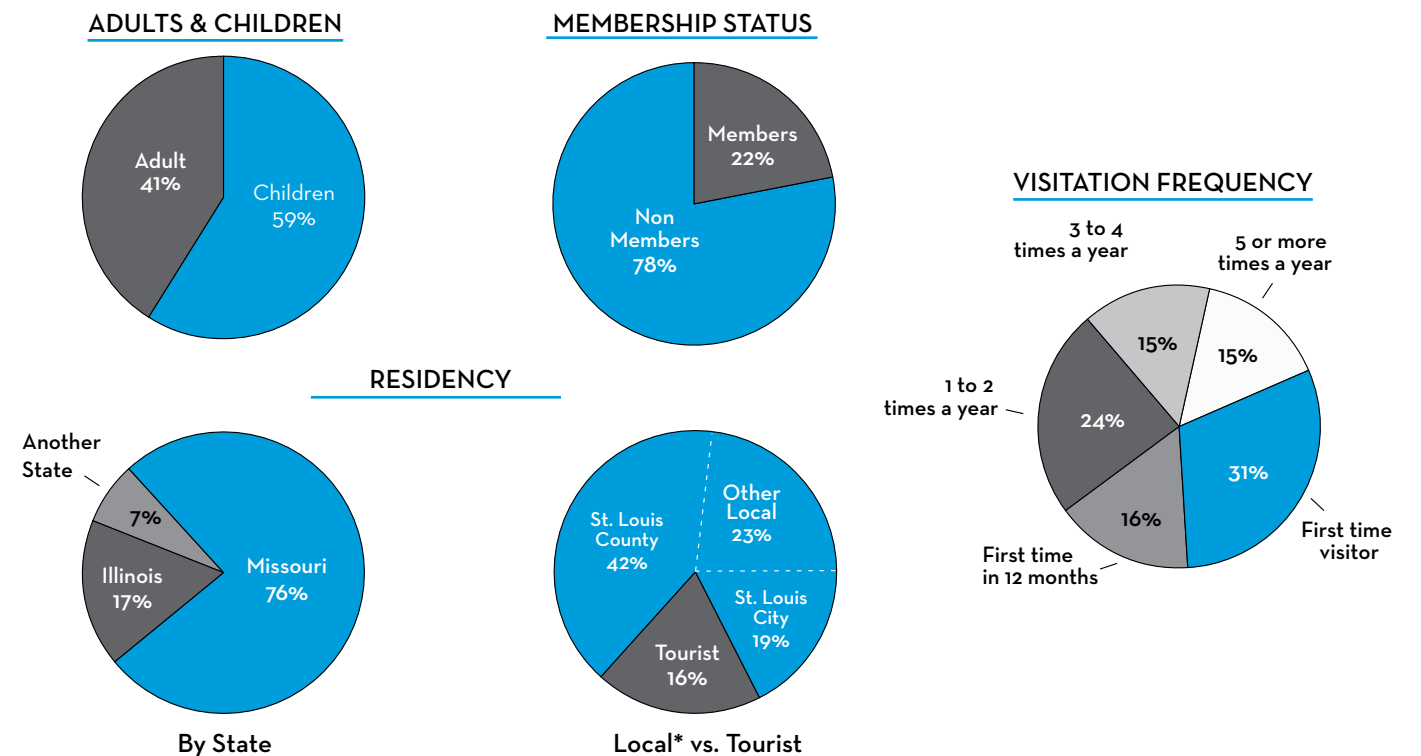
Broad View of Program Interaction

From September 2007 to August 2008, the Saint Louis Science Center offered approximately 100 distinct programs to children, school groups, teachers, families, and adults. Some of these programs were one-time offerings; many were offered multiple times. The Science Center tracks each time an individual participates with a Science Center program and references this participation as an "interaction". The duration of these interactions can range from a 15-minute *Amazing Science Demonstration* to a multi-day experience such as a camp or travel program. Individuals engaged in over 380,000 interactions with Science Center programs during this time period, for a total of 391,544 hours of engagement. The average amount of time participants spent with Science Center programs was slightly over an hour.

From these program interactions, BERTT cards (please see page 3 for a description of the BERTT system) were collected from a little over 11,000 program participants for a return rate of 3%. Respondents gave the following average ratings:

- Impact Score: 8.38 (out of 10)
- Satisfaction: 3.62 (out of 4)
- Mission: 3.69 (out of 4)
- Interest: 3.22 (out of 4)

Characteristics of Program Respondents



*Residing within St. Louis City, St. Louis County, and ten surrounding counties in Missouri and Illinois.

Analysis of Ratings by Age, Membership, Residence, and Visitation Frequency

Overall, Science Center programs seemed to have the greatest amount of impact on children, Science Center members, local residents, and frequent visitors. All comparisons presented here are statistically significant at p 0.001*.

As illustrated in the table below, on average, children gave significantly lower ratings than adults for the mission question (3.62, 3.79) and satisfaction question (3.59, 3.67). Children gave significantly higher ratings than adults for the interest question (3.50, 2.80). Also, the impact score for children was significantly higher than for adults (8.61, 8.05).

Members gave significantly higher ratings for all questions, on average, than did non-members. Members gave significantly higher ratings than non-members on the mission question (3.74, 3.68), satisfaction question (3.68, 3.58) and interest question (3.41, 3.04). Overall, Science Center programs had a significantly higher impact on members. The average impact score for members was 8.58, compared to 8.27 for non-members.

On average, tourists gave significantly higher mission and satisfaction ratings than local residents. Tourists gave an average mission rating of 3.79 compared to locals with 3.69. Tourists gave an average satisfaction rating of 3.72 compared to 3.61 for locals. Average interest question ratings were higher for locals (3.25) than for tourists (2.90). Local residents had a significantly higher impact score than tourists (8.53, 8.31). St. Louis County residents had a significantly higher impact score (8.61) than residents of St. Louis City (8.31).

The highest impact scores are from outer metro areas of Illinois (8.64) and Saint Louis County (8.61). Residents of Missouri (8.47) and Illinois (8.50) had significantly higher impact scores than residents of other states (8.07).

On average, respondents who indicated they visit the Science Center on a more frequent basis tended to give higher interest ratings. Higher visitation frequencies also correlated to higher impact scores. Infrequent visitors (fewer than one visit per year) had an impact score of 8.35 and regular visitors (one to two times per year) had an impact score of 8.37, compared to an impact score of 8.62 for frequent visitors (three or more times per year).

	IMPACT SCORE	MISSION	SATISFACTION	INTEREST
Children	8.61	3.62	3.59	3.50
Adults	8.05	3.79	3.67	2.80
Members	8.58	3.74	3.68	3.41
Non-Members	8.27	3.68	3.58	3.04
Tourists	8.31	3.79	3.72	2.90
Locals	8.53	3.69	3.61	3.25

*The p-value is a measure of significance. In general, p-values of 0.05 or less are considered statistically significant.

PROGRAM OVERVIEW, BY DEPARTMENT

At the Science Center, programs are divided into five major departments: **Challenger Learning Center-St. Louis, Community Science, Public Programs, School Programs, and Science & Galleries.** Following is an analysis of program offerings based on these categories.

Challenger Learning Center-St. Louis

The Challenger Learning Center, located in Ferguson, MO, provides space education programs for schools, corporations, scouts, community groups, and the general public. At the core of the Center are space simulators, which include a replica “orbiting” space station and a Mission Control center. The program is part of the Challenger Center for Space Science Education, an international, not-for-profit education organization founded in April 1986 by the families of the astronauts tragically lost during the Challenger space shuttle mission. Locally, the Center is supported by a regional partnership of the Saint Louis Science Center, the Ferguson-Florissant School District and the Cooperating School Districts. Mission simulations include: *Micronauts in Orbit*, *Rendezvous with a Comet™*, *Return to the Moon™*, and *Voyage to Mars™*.

Offerings: 13 distinct programs

Interactions: 15,208

Total hours of engagement with programs: 34,984

Average length of engagement with programs: 2¼ hours

Range of program engagement times: 20 minutes to 6 hours

Overall ratings (1,505 collected/10% return rate):

- Impact Score: 9.17 (out of 10)
- Mission: 3.75 (out of 4)
- Satisfaction: 3.76 (out of 4)
- Interest: 3.53 (out of 4)

Overall, 91% of the respondents were children and 91% were first-time visitors to the Challenger Learning Center. Fifty-eight percent of respondents resided in Saint Louis County. Children reported being less satisfied with their program experience than adult participants, but they looked forward to the program to a greater degree. Children had lower satisfaction ratings than adults, but higher interest ratings and a higher impact score. The average impact score for children participating in Challenger Learning Center programs was 9.25, compared to 8.35 for adults.

“I liked that we were in control of what to do! Because we didn’t have to take a lesson on it we got to do it and learn at the same time.”
-Child participant, *Voyage to Mars™*



A Cool Valley Elementary School student works on board the Space Craft during a simulated space mission. (Photo: Ron Bookout, The Boeing Company)

“I liked flying gliders, because I enjoyed watching my glider loop as the air pushed it.”
-Child participant, *Scout Programs*

Community Science Department

"I learned a lot of interesting things today. For instance, toothpaste has rocks in it!"
-Student, GEAR UP-Wellston

The Community Science Department cultivates relationships with community-based organizations serving families throughout the St. Louis area. These partnerships produce programs promoting wellness, diversity, and education. In addition, the department supports community organizations by providing them with tools and strategies to integrate science, technology, engineering, and math curriculum into their programs. Partnering community organizations support the Science Center in many ways, including participation in programs such as **Community Science Days** and **Minority Scientists Showcase** and through recruiting teens from their client base for the **Youth Exploring Science (YES)** program.

"[The highlight for me was] watching my kids have fun learning science. I don't always get to see them smile like they did today."
-Teacher, GEAR UP-Ritenour

YES serves youth dealing with multiple risk factors and works with teenagers throughout the course of their high school career. **YES** provides a work-based, inquiry-learning environment focusing on science, mathematics, technology, and engineering. **YES** participants gain professional, academic, and real-world skills that assist in building self-confidence and personal success. In their teaching initiative, **YES** teens take museum science education into the community and facilitate hands-on science and mathematics activities at partner organizations. Programs include: **City Science**, **Learning Places**, **Public Health Advocates**, **Science After School**, and **YES-2-Tech**.



YES Teen Harold Collard, Jr. engages in an inquiry activity. (Photo: Saint Louis Science Center)

Offerings: 21 distinct programs
Interactions: 13,575
Total hours of engagement with programs: 38,127
Average length of engagement with programs: 2³/₄ hours
Range of program engagement times: 45 minutes to 5¹/₂ hours
Overall Ratings (2,350 cards collected/17% return rate):

- Impact Score: 7.97 (out of 10)
- Mission: 3.49 (out of 4)
- Satisfaction: 3.37 (out of 4)
- Interest: 3.14 (out of 4)

The majority of respondents (73%) were children. Respondents were fairly equally split between residing in Saint Louis City (49%) and Saint Louis County (44%).

In general, Community Science programs had a greater impact on children and frequent visitors. Children gave higher interest ratings and had a higher impact score, at 8.09, than adults, at 7.64. Frequent visitors had a higher impact score (8.21) than infrequent (7.93) and regular (7.94) visitors. There was no difference in average impact scores between residents of the City and the County.

Public Programs Department

Programs offered by this department may occur either at the Science Center or off-site and are designed for a range of audiences including: adults, families, scouts, campers, and home-school groups. Programs designed for school age children provide fun, engaging activities and field experiences through week-long and overnight camps, badge workshops, and day-long events. For interested adults, **Science Cafés** feature presentations and discussion of contemporary science topics at local restaurants. Other programs include: **Segway**, **Camp-ins**, and **Summer Science Blast**.

Offerings: 24 distinct programs
Interactions: 10,074
Total hours of engagement with programs: 46,175
Average length of engagement with programs: 4¹/₂ hours
Range of program engagement times: 20 minutes to 16 hours
Overall Ratings (3,019 cards collected/30% return rate):

- Impact Score: 8.42 (out of 10)
- Mission: 3.75 (out of 4)
- Satisfaction: 3.69 (out of 4)
- Interest: 3.06 (out of 4)

Overall, 51% of respondents were adults, 47% were infrequent visitors to the Science Center, 20% were Saint Louis Science Center members, and 25% were tourists. Of local residents, the highest number of respondents (40%) resided in Saint Louis County.

Similar to overall Science Center programs, Public Programs had a greater impact on children, members, local residents, and frequent visitors. Children had a higher impact score, at 8.72, than adults, at 8.12. Members also had a higher impact score, at 8.68, than non-members, at 8.41. The impact score for local residents was 8.59, compared to 8.35 for tourists. Frequent visitors had higher interest ratings and a higher impact score (8.78) than regular (8.53) and infrequent (8.23) visitors.

"I enjoyed the planetarium when we saw all the stars in the sky. It reminded me of the sky at my grandma & grandpa's."
-Child participant, Camp-In



A Summer **Science Blast** camper experiments with bubbles in the class, "Slimy, Squishy, and Sometimes Icky". (Photo: Saint Louis Science Center)

"Learning about the groundbreaking research that will take place that will be monumentally helpful to those who are suffering from cancer and receiving chemotherapy treatment."
-Adult participant, Science Café

"I liked planting the philodendron because I think I feel like I'm giving back to the environment."
 -Child participant, *Ecology in a Jar*

School Programs Department

The School Programs department offers hands-on, inquiry-based science workshops to school groups visiting the Science Center as well as classroom programs delivered at schools. The department also offers professional development for teachers and opportunities for parents to practice skills in interacting with their children around science, technology, engineering, and mathematics learning. All programs conform to Missouri and Illinois state standards. Staff work directly with educators to identify target areas and content focus, designing customized learning programs that encourage students and educators alike to take ownership of the experience. Using current education research and best practices, the department has the expertise to customize programs on a district-wide basis. Programs include: **Earth Balloon, Family Math & Science, MySci, Storybook Science**, and a variety of teacher professional development workshops.

Offerings: 27 distinct programs

Interactions: 17,138

Total hours of engagement with programs: 63,988

Average length of engagement with programs: 3³/₄ hours

Range of program engagement times: 45 minutes to 4 hours

Overall Ratings (1,138 cards collected/7% return rate):

- Impact Score: 8.63 (out of 10)
- Mission: 3.64 (out of 4)
- Satisfaction: 3.60 (out of 4)
- Interest: 3.50 (out of 4)

"Dissecting the different beans to see their growth and being shown how to take this back to the classroom"
 -Teacher, *Professional Development Workshop*



The majority of respondents were children (82%) and non-members (87%). A total of 33% of respondents were frequent visitors and 23% were residents of Illinois. School Programs had a greater impact on children; the impact score for child respondents was 8.74, compared to 8.10 for adults. Also, Missouri residents had a higher satisfaction rating (3.60) than Illinois residents (3.46).

Educators in an *Inquiry Institute* practice an activity they will later implement in their classrooms. (Photo: Saint Louis Science Center)

Science & Galleries Department

Programs offered through this department usually take place in the Science Center's permanent galleries and are generally facilitated by gallery staff. Science & Galleries programs are all tied to the Science Center's five main content areas: earth science, emerging technologies, life science, physical science, and space science. As appropriate for program content, some programs in this department may be held at off-site locations. Some programs include: **Amazing Science Demonstrations, the Discovery Room, DNA In-Depth: Examining the Evidence, FIRST Robotics, LEGO Mindstorms™, Paleotrek** (a paleontology travel program), and **Planetarium experiences**.

Offerings: 36 distinct programs

Interactions: 327,889

Total hours of engagement with programs: 208,210

Average length of engagement with programs: 45 minutes

Range of program engagement times: 15 minutes to 70 hours*

Overall Ratings (3,252 cards collected/1% return rate):

- Impact Score: 8.21 (out of 10)
- Mission: 3.77 (out of 4)
- Satisfaction: 3.68 (out of 4)
- Interest: 3.17 (out of 4)

A slight majority of respondents were adults (64%). A total of 39% of respondents were infrequent visitors, 32% were members of the Science Center, and 24% were tourists. Similar to overall Science Center programs, Science & Galleries programs had a greater impact on children, members, local residents, and frequent visitors. The impact score for child respondents was 8.40, compared to 8.10 for adults. Members had a higher impact score, at 8.62, than non-members, at 8.17, and local residents had a higher impact score, at 8.52, than tourists, at 8.10. There was a positive correlation between visitation frequency and impact score; the higher the visitation rate, the higher the score. Frequent visitors had an impact score of 8.69.

*Over an eight-day period during a Science Center travel program.

"I thought it was cool that we got to dissect a heart! I didn't know that it looked like that inside!"
 -Child participant, *Family Med School Labs*



Young scientists extract their own DNA in a Life Science Lab Classroom program, **Gene Shorts**. (Photo: Saint Louis Science Center)

"Very informative! Hilarious. Great job! He did a wonderful hot & cold. I'm a science major & learned something!"
 -Adult participant, *Amazing Science Demonstration*

PROGRAM SPOTLIGHT

This section highlights four of the approximately 100 programs offered in 2007-08. The selected programs offer participants prolonged engagement, ranging from multiple days to multiple years, with science and technology content and experiences. In 2007-2008 we highlight: **Challenger Learning Center Student Missions**, **MySci™**, **Nanofuture Forums**, and **Travel Programs**.

Program Spotlight: Student Missions – Micronauts in Orbit and Voyage to Mars™ (Challenger Learning Center-St. Louis)

The Challenger Learning Center's student missions offer participants from kindergarten through eighth grade the opportunity to engage in various space exploration missions while learning and using concepts of science, math, engineering, communication, and teamwork.

For students in kindergarten through fourth grade, the **Micronauts in Orbit** program allows participants to experience what it would be like to travel to the International Space Station to perform hands-on experiments and handle situations as scientists, mathematicians, or engineers. For students in grades fifth through eighth grades, the missions **Rendezvous with a Comet™**, **Voyage to Mars™**, and **Return to the Moon™** offer a more in-depth educational experience which simulates conducting and completing a space mission while overcoming various obstacles.

Each of the student mission programs lasts approximately two hours and includes extensive materials and resources for educators to assist with preparing students for the experience. The program also includes follow-up activities to reinforce the concepts and ideas learned during the program. To better understand how these programs impact participating students, we focus on **Micronauts** programs offered from September 2007 through May 2008 and **Voyage to Mars™** missions from September 2007 through January 2008.

Altogether, over 5000 students participated in these two missions during the 2007-2008 program year. From this group, a total of 599 BERTT cards were collected; 306 from **Micronauts** and 293 from **Voyage to Mars™**. To better understand the educational impact of these programs, some students were given in-depth mission surveys in lieu of the BERTT surveys. These surveys, administered both before and after each mission was completed, contained questions pertaining to content presented during the missions along with questions assessing student interest. For the **Micronauts** missions, a total of 74 pre-mission surveys and 68 post-mission surveys were returned; for **Voyage to Mars™**, 114 pre-mission surveys and 108 post-mission surveys were returned. The information presented here incorporates data collected from both BERTT and the in-depth mission surveys.

Micronauts in Orbit

The average BERTT ratings among **Micronauts** respondents were:

- Impact Score: 9.40 (out of 10)
- Satisfaction: 3.77 (out of 4)
- Mission: 3.80 (out of 4)
- Interest: 3.73 (out of 4)

Educators commented that this experience was a great opportunity to engage the students with hands-on learning about space science.

- [My highlight was] *“How much the students learned- and enjoyed!”*
- *“The highlight for me was hearing my students ask intelligent questions that were pertinent to what the Flight Commander was discussing with them.”*

On in-depth surveys, third and fourth graders were asked about tools astronomers use, the order of planets in the solar system, the nature of light, the components of the Space Transportation System, and how to correctly read temperature scales. Post-mission surveys revealed that students in both grades demonstrated increased knowledge in each of these areas; several questions showed significant improvement. For example, when asked, “Light is made of many different __”, only 11% of students were able to provide a reasonably correct response prior to completing a **Micronauts** mission (correct answer: colors). In post-mission surveys, 76% of respondents gave a reasonably correct response. Though only a handful of BERTT respondents mentioned learning new information during the mission, the in-depth surveys demonstrated that participants are learning new information through the hands-on activities and experiences.



Students on board the Space Craft use spectrum analysis to identify the gas coming from an unknown object. (Photo: Ron Bookout, The Boeing Company)

Voyage to Mars™

The average BERTT ratings among **Mars** respondents were:

- Impact Score: 9.00 (out of 10)
- Satisfaction: 3.72 (out of 4)
- Mission: 3.62 (out of 4)
- Interest: 3.40 (out of 4)

Highlights from BERTT respondents focused heavily on the hands-on aspect of the missions. Though not nearly as frequently mentioned, students also enjoyed the realistic space travel environment and the challenge of solving problems as a team. Comments from participants include:

- *“I liked the imagination that is put into building the Center. We don't know what Centers on Mars are going to look like, but I thought the attempt was good.”* (Eighth grade student)
- *“I liked the headphones, because it made me feel like a real ... NASA person.”* (Eighth grade student)

- “I liked when we were in the dust storm because we all had to do something to help.” (Sixth grade student)
- “I liked it when we faced problems. It made it more exciting!” (Sixth grade student)

Educators in the **Mars** program also made many positive comments about their students’ interest and engagement.

- “The students were actively engaged and on task. This year this is a condition seldom seen in our classrooms!”
- “The students were enthusiastic and anticipated learning a lot- they weren’t disappointed.”

Similar to the **Micronauts** results, students completing the **Mars** in-depth surveys demonstrated increased knowledge of space technologies and physical properties of Mars. For example, the correct responses to a question concerning why Mars is known as the Red Planet increased significantly from 67% pre-mission to 91% post-mission.

Overall, these programs offer students the opportunity to explore space science through physical engagement with the environment and technology. The hands-on experience gives participants a sense of ownership while instilling the values of teamwork and communication needed to successfully complete the mission. Educators and participants in all grades indicated thorough enjoyment of the experience and demonstrated increased knowledge of space science.

Since the inception of the Challenger Learning Center~St. Louis, the number of students participating in these and other programs has increased each year from approximately 4,500 in 2004 to 6,500 in 2008. The increasing interest and participation in the student missions and programs testifies to the Challenger Learning Center’s success in establishing itself as a fun and engaging place for students to learn about space science and develop a lifelong interest in science and related areas.

Program Spotlight: MySci™ (School Programs)

MySci™, funded by the Monsanto Fund, debuted in 2005 and is a collaborative effort, led by Washington University Science Outreach. The Science Center is a partner in the collaboration, along with the Missouri Botanical Garden and the Saint Louis Zoo. **MySci™** seeks to enhance a sense of wonder and interest in science for children and their teachers. The **MySci™** program gives early elementary students (kindergarten through second grade) throughout the St. Louis area the chance to study science through inquiry. It provides curriculum books and classroom kits on plants, animals, and the earth. It also offers a visit from the Investigation Station, a roving vehicle with innovative exhibits where students engage with science by climbing, crawling, seeing, hearing, and smelling.

MySci™ strives to help close the achievement/preparation gap. Toward this end, two-thirds of **MySci’s™** visits are made to schools with underserved and/or low-achieving student populations. Provided free of charge to all schools, the **MySci™** program has served more than 40,000 people, including more than 17,000 students, since its inception. In response to the high demand for the program, **MySci™** launched a second Investigation Station in January 2007.

MySci™ Program Components

- **Inquiry-based science curriculum** with units about plants, animals, and the earth. Aligned with the Missouri Grade Level Expectations, each unit of the curriculum includes pre- and post-visit activities, as well as Investigation Station activities.
- **Professional development for teachers** via a one-day workshop introducing inquiry teaching methods, providing experience with kit materials and activities, and sharing information about other available resources. The workshop also enhances teachers’ abilities to use state and national standards-aligned science content.
- **A materials warehouse** which provides each teacher with a kit of hands-on materials, including literacy, math, and notebooking resources.
- A multi-day visit by the **Investigation Station**. During this visit each student in the school has an opportunity to explore the vehicle and each kindergarten through second grade student participates in a one-hour interactive experience, led by a **MySci™** teacher. Each student visits the three zones of the station: the Missouri Woodland Area, the Laboratory Room, and a replica of a Missouri limestone cave.



On the **MySci™** Investigation Station, Wellston Elementary students dissect flowers with **MySci™** specialist Tanya Cross. (Photo: Washington University Science Outreach)

- *Web-based support for teachers (www.mysci.info)* which provides teachers with information about *MySci™* and other resources: curriculum, professional development, and inquiry materials. The site also provides a way to communicate with *MySci™* staff and partners, network with other *MySci™* teachers, and give feedback about the program.

Student Gains

During the 2007-2008 school year, a sampling of *MySci™* students completed a survey before beginning the curriculum unit. Administered by their teacher, the age-appropriate survey gathered information about students' interest in science, awareness of scientists, and knowledge of science content. After experiencing all components of the *MySci™* curriculum, students completed a post-unit survey which asked the same questions.

The sample consisted of kindergarten classrooms implementing the Animal Unit, first grade classrooms using the Plant Unit, and second grade classrooms working with the Earth Unit. These are the units that these grades use most frequently. Comparing pre-survey to post-survey scores, all grade levels showed gains, on average, from the pre-survey to the post-survey. A number of these gains were statistically significant. All grades had a statistically significant average gain in science interest, awareness of scientists, and knowledge of science content.

Responses from Teachers

At the end of a *MySci™* unit, teachers also completed surveys. During the 2007-2008 school year, 200 teachers (from a total of 342 participating teachers, for a return rate of 58%) completed a survey about their experience with the *MySci™* program. The survey asked teachers to rate a variety of components related to their experience of the program and also gave them an opportunity to offer feedback.

Teachers rated obstacles they faced in implementing the unit on a scale of "0" ("not at all") to "4" ("significant obstacle"). "Student attitude" and "Student behavior", factors often cited as obstacles to effective classroom learning were rated low (0.54 and 0.93, respectively) and indicate that these factors were not significant obstacles for teachers during implementation. Teachers were also asked to rate their teaching experience on a scale of "0" ("not at all") to "4" ("strongly agree") and gave high average ratings for "Students became very engaged" (3.30) and "Fits the needs of my students" (3.17). This may suggest that the learning experiences were of such high interest to students that any usual attitude and behavior issues were mostly eliminated.

In their answers to open-ended questions, teachers seemed to agree overwhelmingly that the *MySci™* hands-on, inquiry-oriented

science activities and kit materials make science a fun and engaging learning experience for their students, as well as for themselves.

- "I want to thank you again for providing everything for us: all the background information and the kits and the materials. You help me, the teacher, so that I can provide the best learning experience." (First Grade Teacher, Spring 2008)
- "Having appropriate materials for hands-on exploration certainly makes science 'real' for young children." (Kindergarten Teacher, Fall 2007)

Teachers are sometimes skeptical of new approaches and programs, but seemed to find *MySci™* very beneficial.

- "My initial thought was-'oh no, not another thing to fit in!' However, it ended up being such a neat experience for all! Either I learned something new or it supported what I did know." (First Grade Teacher, Winter 2008)
- "My students are still talking about the lessons; they went home and told their parents and they want to know more about the lessons." (Kindergarten Teacher at an 80% ESL School, Fall 2007)

While many schools are extending their instructional times in reading and math and cutting the time allotted to science and social studies, this does not necessarily translate into better reading and math scores. Teachers noted that science and social studies inquiry learning are exciting and engaging ways for students to apply and extend their reading and math skills.

- "Teachers found students suddenly excited about learning again." (Curriculum Coordinator, Winter 2008)
- "I do plan to use the 5E's (Engage, Explore, Explain, Elaborate, Evaluate) in designing future lessons in all areas. Thank you!" (Kindergarten Teacher, Winter 2008)

Some teachers integrated other required skills and content instruction with *MySci™* curriculum lessons, thereby expanding time for science in the curriculum and applying new skills and content from other disciplines to science. For example, one second grade teacher used Open Court Reading stories, dealing with fossils and paleontologists to make the *MySci™* Earth Unit curriculum a longer, integrated unit. Another teacher used a math and prediction activity to engage first graders with the story, *Arnold's Apple Tree*, part of the *MySci™* Plant Unit curriculum.

Based on the positive responses of educators and administrators to *MySci™*, the Science Center looks forward to continuing its involvement with this exciting partnership and expanding the program's reach among early elementary students.

Program Spotlight: Nanofuture Forums (Science & Galleries)

Since 2003, the Science Center has had an institutional initiative to educate regional audiences about the growing importance of nanotechnology. The Science Center has applied resources to building this initiative, sought partnerships and funding, and worked to create strong connections with other science centers and research laboratories throughout the country.

The Science Center participated in the first nanotechnology education workshop hosted by the National Science Foundation (NSF) in 2003, worked with several collaborations on nanotechnology education funding proposals (2004-2008), hosted a half-day public presentation on *Nanotechnology in Everyday Life* (2005), and is a member of the NSF-funded Nanotechnology Informal Science Education Network (NISE Net). The Science Center's first annual *NanoDays* event took place in 2008, along with a growing schedule of nano-related programming.

The Science Center has an excellent reputation within the community as an accurate and unbiased information source. This makes the Science Center an effective venue for engaging members of our public who are skeptical or fearful of nanotechnology.



Professor Pratim Biswas, featured *Nano Futures Forum* speaker, discusses the use of nanoparticles in consumer products with forum participants. (Photo: Saint Louis Science Center)

In 2006, the Science Center was invited to become an outreach partner for the NSF-funded project, *Nanotechnology: Convergence of Science and Society*, a partnership between Oregon Public Broadcasting, ICAN Productions, the American Association for the Advancement of Science (AAAS), and seven science centers. This national project aimed to provide balanced views of the benefits and risks associated with the use of nanotechnology.

The project also sought to encourage interest and discussion among adult audiences about the future use of this technology related to personal security, health, and the environment. Its key deliverables were:

a PBS seminar series, podcasts, a website, and public forums. As a partner in the *Convergence* project, the Science Center was invited to be the third U.S. location for *Convergence NanoFutures Forums*, funded under a separate grant from the Department of Energy.

The program *Nanofuture: You and the Environment* series consisted of two, free public forums, held on May 6 and May 28, 2008, about nanotechnology and its implications for the environment. These forums brought together local experts and the public to probe the impact of nanotechnology in the St. Louis region.

During the first event, participants explored the use of nanotechnology in personal care products and the associated potential risks of such use. At the second forum, participants examined the environmental impact of the use of nanotechnologies in various common household products. At each event, guest scientists presented different viewpoints and research related to nanotechnology. Participants considered the role of public policy in regulating the use of nanotechnology. SLSC facilitators then led table discussions where participants talked about various scenarios related to the presentations, and reported out to the whole group.

At the conclusion of each forum, participants were asked to either complete a BERTT card or respond to an in-depth survey from the project evaluators, Inverness Research Associates. For the two forums, a total of 120 adult participant interactions were recorded, 41 BERTT cards were collected, and 43 surveys were completed. Of the BERTT respondents, 39% were current members of the Science Center and 100% resided within the St. Louis metropolitan region. Forty-one percent of respondents were frequent Science Center visitors (three or more visits annually), 32% visited regularly (one or two times annually), and 27% visited infrequently (less than one visit per year). The average BERTT ratings among respondents were:

- Impact Score: 7.88 (out of 10)
- Satisfaction: 3.44 (out of 4)
- Mission: 3.80 (out of 4)
- Interest: 2.58 (out of 4)

Respondents to the Inverness survey were asked about prior expectations of the forum. The majority of these respondents indicated that a personal interest in the topic of nanotechnology motivated them to attend. They came with more interest in the topic of nanotechnology and learning about its potential societal impacts than in the opportunity afforded by the forums to question experts in the field and discuss the topic with fellow citizens. However, after each event, many participants expressed enjoyment of the open discussion format and the opportunity to express their own opinions while considering others' ideas.

- *"Enjoyed the experience of reaching a group opinion."* (Participant, May 6)
- *"Hearing the opinions of others - made me think."* (Participant, May 28)

Respondents to the Inverness survey indicated that the forums helped to inform them about the societal and ethical implications of nanotechnology and also increased their interest in learning more about the role of nanotechnology in security, biological, and environmental issues. Respondents to both surveys also described learning new information about nanotechnology, in general.

- *"I learned a ton about nanotechnology and I had no idea what it was at the beginning of the night."* (Participant, May 6)
- *"Deeper understanding of nanoparticle, its advantage and disadvantage."* (Participant, May 28)

Respondents to each survey indicated a general enjoyment of the presenters. A few noted that a speaker's terminology made it difficult to fully understand the presentation.

- "Because of my listening vocabulary level I was able to understand the negatives of nanotechnology to a greater degree than the positives."
(Participant, May 6)

Overall, the *Nanofuture Forums* provided a valuable educational experience for participants by generating interest in and discussion about the challenges of utilizing nanotechnology. Respondents participating in this program enjoyed the opportunity to learn about and engage with an unfamiliar topic and express their own opinions about how to handle future situations. Some respondents also mentioned that it sparked a desire to continue learning about nanotechnology and suggested that the program be available again in the future.

Additionally, this forum gave the Science Center an opportunity to collaborate with numerous science-based organizations across the country, and furthered the Science Center's mission to introduce new and advancing technologies to the St. Louis region. While the *Nanofuture Forums* were a one-time opportunity, the Science Center will incorporate elements of this event into future offerings. In 2009, the Science Center will host our second annual *NanoDays* event and will offer an accompanying public forum.

Program Spotlight: Travel Programs (Science & Galleries)

Since 2002, the Science Center has offered a variety of scientific destination excursions ranging from day-long trips exploring the St. Louis region to multi-day international journeys. These programs, developed and administered by the Science & Galleries Department, are designed to appeal to adults, educators, school groups, and families through hands-on exploration of outdoor-based scientific disciplines such as paleontology, archaeology, ecology, and resource management.

In the 2007-2008 program year, there were a total of 349 participant interactions in eight different travel programs. Local, one-day travel programs included: *Fossils around Town*, *Lewis and Clark around Town*, *Bonne Terre Mine Tour*, and *Mines of Missouri*. Multi-day destination trips included: *Ancient Americas* (Cortez, CO and Washington state), *Paleotrek* (Jordan, MT), *Science of the National Parks* (Yosemite National Park, CA; Hawaii Volcanoes National Park, HI), and *Family Archaeology* (Kampsville, IL). Among these program participants, a total of 239 BERTT cards were collected; 45% were from children (aged 17 or less) and 55% were from adults. Approximately 41% of the participants were members of the Science Center and 80% lived within the metropolitan St. Louis region. Respondents were distributed fairly evenly among visitation patterns with 35% being infrequent Science Center visitors (less than one visit annually), 27% regular visitors (one to two annual visits), and 38% frequent visitors (three or more annual visits). The average participant ratings among all eight *Travel Programs* were:

- Impact Score: 8.71 (out of 10)
- Satisfaction: 3.65 (out of 4)
- Mission: 3.81 (out of 4)
- Interest: 3.14 (out of 4)

To better understand the impact of these programs, two multi-day programs, *Ancient Americas* and *Paleotrek*, along with the one-day program, *Fossils around Town*, are discussed in more detail.

Fossils around Town offered participants the chance to discover the rich geological history of the St. Louis region on a day-long excursion. In this program, school groups and families traveled to local rock sites and collected genuine fossils to take home while learning about Missouri's geologic past. During the 2007-2008 year, a total of 217 students, chaperones, and families participated in this program, from whom a total of 125 BERTT cards were collected. The average ratings for *Fossils around Town* were:

- Impact Score: 8.50 (out of 10)
- Satisfaction: 3.44 (out of 4)
- Mission: 3.66 (out of 4)
- Interest: 3.29 (out of 4)

When asked to describe the highlight of the program, over 50% of the participants mentioned specific aspects of the program such as finding fossils or learning about geology.



Participants in the *Ancient Americas* travel program climb a cliff in the Four Corners region to explore the ruins of the Anasazi, an early American Indian culture. (Photo: Saint Louis Science Center)

- *“Finding new fossils. Because its fun learning about things that are billions of years old.”* (Child participant)
- *“Finding actual fossils, having Ron explain what we found & the age of the seabed.”* (Adult participant)

Overall, the program seemed to offer an enjoyable opportunity for children and families to have a hands-on experience with geology and paleontology.

In addition to local trips, the Science Center offered several opportunities for travel to locales across the United States. In the **Paleotrek** program, participants traveled to Jordan, Montana, for a week-long, hands-on paleontology field experience. Participants excavated and collected dinosaur-age bones and materials. This program was offered twice during the 2008 season, once for an adult audience and once for families with children over 10 years old. The **Ancient Americas** program provided a similar field experience to discover archaeology through excavation and curation of American Indian artifacts. This week-long trip was also offered twice, once to Cortez, Colorado, to study the cultures of the desert Southwest and once to Washington state to study the cultures of the Pacific Northwest.

Among these two programs, a total of 44 participants completed 40 BERTT cards. The average ratings of responding participants in these programs were:

- Impact Score: 8.86 (out of 10)
- Satisfaction: 3.93 (out of 4)
- Mission: 3.98 (out of 4)
- Interest: 2.79 (out of 4)

When asked about their highlights, 50% of respondents referenced specific activities such as excavating or exploring. Another 50% described personal growth through exploration, discovery, or new learning experiences.

- *“Learning what it means to be Native American, the interdependency of people and belief systems. Making friends and honoring my grandfather’s ancestry.”* (Adult participant, *Ancient Americas*)
- *“Excavating fossils. I got to dig in the dirt and call it science.”* (Child participant, *Paleotrek*)

Participants in these two programs were also given the opportunity to respond to in-depth questions about the impact of the program, the learning opportunities it provided, and, for educators, how the experience would affect their classroom approach to the subject matter. Nearly half of the respondents described learning new information or participating in a unique experience. Another 25% specifically mentioned the desire to further the experience, either through increased participation or sharing the information with others.

- *“Much deeper knowledge and more excitement to teach evolution & paleontology.”* (Adult participant, *Paleotrek*)
- *“I developed a connection to this area. I’ve also felt a major change in myself as a nature enthusiast and I’m interested in discovering new/other parts of the world.”* (Adult participant, *Ancient Americas*)

The four child participants in **Paleotrek** all indicated that the experience strongly influenced their future career decisions.

- *“It helped me choose what I want to do when I go to college.”*
- *“I want to be a paleontologist even more now.”*

In describing learning opportunities, the majority of respondents described new information, discovery, or exploration of new subject material. Others described the hands-on experience of the program.

- *“It made me REALLY appreciate the work involved in locating & excavating fossils. It made me think outside of my normal realm.”* (Adult participant, *Paleotrek*)
- *“I loved how I got to help with excavating a REAL dino bone.”* (Child participant, *Paleotrek*)

For educator-participants, the program provided them with in-depth information about the topic, personal experiences in the field to share in the classroom, and actual specimens to use for hands-on learning. Some educators expressly mentioned that they will be incorporating new hands-on experiences in their classes as a direct result of the travel program.

- *“With fossil fragments, enriched background and the field experiences, a new lab (fossil examination) will be added to the curriculum.”* (*Paleotrek*)
- *“Before excavating artifacts myself, I found looking at artifacts less interesting. I will develop units using the Anasazi Center loan kits.”* (*Ancient Americas*)

These two travel programs deeply affected participants through the opportunity to explore hands-on science in the field. For adults and children alike, these travel experiences allowed them to gain first-hand knowledge and experience in the fields of paleontology or archaeology and fostered a desire to continue exploring science and sharing new discoveries. For educators, these experiences directly influenced how they will present material in the classroom through incorporating hands-on activities. The high ratings of these programs combined with the numerous highlights and impacts described in participants’ own words demonstrate a high level of engagement with and appreciation of these programs.

LOOKING TO THE FUTURE

As we issue our second *Report to the Community*, the Science Center is in the process of both expanding our reach to new audiences and honing our methods for collecting information about these audiences. In addition to developing a new system for assessing how participants respond immediately after a program experience, we are working on collecting longitudinal data. We will be contacting some program participants a few months after their interaction to learn how they are processing their Science Center experience.

We are also expanding our partnerships, within the St. Louis region and beyond. As evidenced by the spotlighted programs in this report, we are broadening and deepening our reach by strengthening our relationships with area schools and universities, museums, and community organizations. Particularly through grant-funded projects, we are also working with museums and other entities across the country. These partnerships enrich our process, enable us to serve our audiences more efficiently and effectively, and help us to reach new audiences.

We are reaching out to adult audiences to a greater degree. The travel programs, spotlighted in this report, are one example of our expanded opportunities for adults. Next year's report will include a spotlight on **SciFest 08**, another exciting opportunity to cultivate adult audiences. **SciFest** debuted at the Science Center in October 2008 and is an international science festival made up of hour-long sessions presented by world-renowned scientists and experts. The Science Center was chosen, over many major cities, as the site for the first SciFest in the United States. It is based on and produced in collaboration with the highly successful Cheltenham Science Festival in the U.K., and will be an annual event at the Science Center. Through this program, the Science Center seeks to increase the visibility of science and technology in the St. Louis community and raise the profile of St. Louis as a leader in science and technology.

We are also improving our methods for learning about program participants' experiences. We have worked with the Impact Score for a little over two years and have recently refined and improved our system for assessing impact. Beginning in January 2009, we will implement **System for Assessing Mission Impact (SAMI)**. **SAMI** will replace *BERTT* and will improve our ability to consistently evaluate all Science Center program offerings. This system will more accurately measure the impact of our programs and will be more useful to program staff as they rework and refine their programs. Our new system reflects the recent NSF *Framework for Evaluating Impacts of Informal Science Education Projects* and keeps the Science Center at the forefront of the informal learning field.

Most importantly, this system will allow us to better serve our audiences. We look forward to reporting our findings in the next *Report to the Community*.

NOTES

APPENDIX

Saint Louis Science Center Education, Exhibits & Programs Staff As of September 2008

Derrick Adams*	Tori Burns*	Terrence Dwyer	Cameron Harris	Shaveal Jones*	Aariel Mills*	Ashley Reekie	Robert Treece
Adeola Adewale*	Ogie Burrow	Trish Edwards	DeVonte Harris*	Terrion Jones*	Floretta Mitchell	Deshawn Reid	Jasmine Tripp*
Ronald Agbigbe*	Korry Busch*	Martha Elias*	Kristina Harris*	Naomi Joshi	Christina Monroe*	Janice Richard*	Kiontey Turner*
Krystal Aikens*	Brandon Byrd	Olef Elias	Gary Allen Hebel	William Kazban*	Fredrick Monroe*	Tegan Rieser	Jazmine Tutwiler*
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Marlow Allen, Jr.*	Paul Calloway*	Cindy Encarnacion	Karlyn Henry*	Steve Kessel	Susan Morris	Robert Rinehart*	Nao JacQuelynn Ueda
Chris Allen	Jessica Castiglioni	Toney Estes*	Cameron Herron*	Kathryn Kiel	Robin Morrison	David Ritchey	Carol Valenta
Saxon Allen*	Adam Catchings*	Jamaal Fisher*	Javier Herron*	Darrion King*	Koran Muhammad*	Valerie Ritchie	Marcella Vamboi*
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Matthew Anderson*	Eldridge Cherry*	Gemecia Fleming*	Quion Hicks*	Rodney Knight*	Cynthia Kramer	Natasha Rogers*	Kimberly Wallis
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Samantha Arbeiter	Jenny Cimino	Jo-Ellen Forrest	Andrea' Hollins*	Tamara Korina	Pam Nazzoli	Evin Russell	Alexander Walters*
Cherelle Assee*	Devin Clark*	David Francis	Garie Holman	Frank Kusiak	Suzanne Nauert	Krystal Salamon	Alexanne Walton
Tre'Sean Atkinson*	Lavelle Clark*	Dalila Franklin	Rodney Holmes*	John Lakey	Malcom Nelson*	Dominic Schaeffer	Zachary Ward*
Jamiah Austin*	Mable Clark	Shaniqua Frazier*	Stephanie Holmes	Andy Lalor	Demisha Nettles*	John Schmitt	Jordyn Warts*
Jasmine Bailey*	Sharniqua Clark*	Paul Freiling	Nona Holmstrom	Marcus Lamb*	Leah Nguyen	Michael Schoenewies	DeVon Washington*
Thomas Bailey*	Melva Claxton	Melinda Frillman	Dylan Houston*	Kris Lane*	Erin Nolan	Sarah Schoenlaub	Kevin Washington*
Jon Baker	Andrea Coffee*	Tasmyn Scarl Front	Jasmine Howard*	Thomas Langdon	Darlene Norfleet	Ron Schowalter	Danny Watson*
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Kyshae Biggs*	Trenell Cooper*	David Gentili	Gywanna Jackson	Ronald London, Jr.*	Nicola Paulette*	Arielle Smith*	John Wilder
Jasmine Billings*	Jean Corse	Ron Giesler	Lawanda Jackson*	Christina Lovett*	Michelle Payne*	Dennis Smith	Silvester Wilkes*
Sarah Bishkin	Courtney Cotton*	Precious Gleason*	Delle Jackson	Chris Lucas	Taylor Payne	Frieda Smith	Jill Willhite
Serafino Bland	Jerricka Cotton*	Katherine Golden	Aja Jacobs	Heidi Lung	Niki Penson*	Ian Smith	Melvin Williams, Jr.*
Michael Blanford	Tanya Cross	Ronald Goldfeder	Breia Jefferson*	Francis Mack	Robert Perlman	Izel Smith*	Antonio Williams*
Alshon Blunt	Dwight Curry	Manuel Gonzalez	Antionette Jenkins	Nicholas Mackey*	Danny Perry*	Briana Sowell*	Brett Williams
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Mark Bradley	Marcus Daily*	Daisionara Gurley*	Justin Johnson*	Travis Mayes*	Diane Pilla	Steve Steadman	Shanae Williams
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Carnekia Burnett*	Pili Dressel	Skyler Harmann	Myesha Jones*	Vincent McKinney*	Robert Powell	Markietta Tate*	Diamond Wright*
Lori Burns*			Randy Jones*	Ann McMahan	Jessica Preston*	Kia Taylor*	Debbie Wudtke
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				Lamar Miller*	Leslie Ramey*	Priscilla Thomas	
				Taylor Miller*	Ilesha Randolph*	Rebecca Thorn	
				Aaprara Mills*	Shannon Rapp	Amanda Tinnin	
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***Youth Exploring Science
(YES) Teen**

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