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SCIENCE EDUCATION PROGRAMS AT THE NEW YORK HALL OF SCIENCE

Background and Mission

The Hall is New York City's hands-on science and technology center. Its mission is "to bring the excitement and understanding of science to children, families, and teachers by galvanizing their curiosity and providing creative, participatory ways to learn." Opened as part of the 1964-65 World's Fair, and chartered in 1967, the Hall was founded during a period of growing interest in broad-based science literacy. This interest has intensified over the ensuing decades, driving the search for educational strategies that engage all young people in the sciences.

The Hall is one of 34 non-profit cultural institutions owned by the City of New York and operated by an independent Board of Directors. Located in Queens, the most ethnically diverse county in the country, the Hall offers an unparalleled expanse of interactive exhibits exploring chemistry, biology, physics, genetics, and much more, for children and adults. These exhibits—combined with a physics-based Outdoor Science Playground, three hands-on Discovery Labs, and nationally replicated science education programs, provide a high-tech, interactive laboratory of discovery for approximately 365,000 visitors each year, with thousands of additional participants served through off-site, school outreach and Internet-based programs.

Our recently completed capital expansion has provided the Hall with 55,000 square-feet of new programming spaces, and the demand for these services is evidenced by an increase in attendance of more than 40% over previous years. We now offer more than 400 hands-on exhibits, including three new permanent exhibitions, a Preschool Place for early childhood learning, the Harcourt Teacher Leadership Center for our enhanced teacher training programs, special exhibition galleries, new discovery labs, a Science Technology Library, increased services to schools, and expanded state-of-the-art facilities for our visitors. In addition to the physical expansion, the Hall's signature education program, the *Science Career Ladder*, has also expanded and now annually offers employment and career mentoring to 200 high school and college students, and after-school programming for 300 elementary and middle school students, from our neighboring communities.

Education, Outreach, and Public Programs

Education programs at the Hall have become national models for teaching science in ways that employ inquiry-based principles informed by the latest studies on how children learn, along with a practical understanding of the realities of the classroom. Students and teachers in the Hall's education and outreach programs are taught by certified instructors and experienced peers.

The Hall's signature education program, the *Science Career Ladder*, continues its mission to offer leadership and employment opportunities, strengthen communication skills, and broaden science learning for underserved elementary, middle, high school and college students. The *Science Career Ladder* employs, trains, and mentors the Hall's Explainer floor staff. Explainers are informed, approachable, and eloquent. They interact with and instruct the hundreds of thousands of annual visitors to the Hall. Additionally, through the *After-School Science Clubs*—the first “rung” on the *Career Ladder*—the Hall's Science Instructors and Explainers engage approximately 300 local elementary and middle school students each year in hands-on science and technology workshops. About to celebrate its 20th anniversary, the *Science Career Ladder* builds on its reputation as an educational program to reach out to more students, more visitors, and more science centers across the country.

NYHOS Education Programs with University Partners

- **CLUSTER:** The Hall has received a \$2.5 million, multi-year grant from the National Science Foundation (NSF) to partner with City College of NY (CCNY) and the City University of NY's Center for Advanced Study in Education (CASE) to develop the *Collaboration for Leadership in Urban Science Teaching, Evaluation and Research* (CLUSTER). CLUSTER will be a model program that integrates the *Science Career Ladder* with CCNY's rigorous science teacher degree program. A portion of the NSF grant will be used to train a cohort of 25 Explainers who will work at the Hall and also take customized courses towards an education degree at CCNY
- NYHOS is partnering with Columbia University's MRSEC (Materials Research Science and Engineering Center) on a project which engages students, teachers and the general public through hands-on, innovative 'rolling exhibits' (Discovery Carts) that are visually attractive, intellectually stimulating and can be used to demonstrate current science and research. This project also unites high school teachers from one of the largest and best known Research Experiences for Teachers programs (RET) in the nation, dynamic University research faculty, and dedicated graduate students with premier public science education specialists from an outstanding science museum.
- Columbia University and the New York Hall of Science have a solid history of collaborations on science education projects, dating back nearly ten years. Most recently, the two institutions began development of portable laboratories to complement the eight and ninth grade New York State Living Environment curriculums. Columbia and the Hall have very similar educational objectives and a proven track record of complimenting each other's goals. The two institutions are located in the largest urban school district in the United States.
- NYHOS works in conjunction with the United Federation of Teachers to offer a variety of graduate credit classes and p-credit courses. During these courses, teachers learn techniques for conducting hands-on science lessons, receive a rigorous review of science concepts and get certified on how to operate one of the Hall's signature portable science laboratories which they can rent year after year for minimal costs and thereby bring high quality labware and equipment right into their own classroom. Current college partnerships are with Brooklyn College and Touro College.

- Current Partnership with NYU – Dr. Pam Abder and Dr. Mary Leou partner with the Hall of Science for at least one session/per semester for one of the required science education courses as part of the fast-track Masters in Education Program within the Wallerstein Collaborative. This partnership has been in existence for more than 10 years and has gained more momentum in the last five years.

Public Programs for family audiences are scheduled for weekend and holiday periods. Preschool programs feature workshops designed to promote parent-child interaction. Ongoing weekend programming includes preschool workshops, Make-it-and-Take-it activities, Weekend Science Clubs, Science Film Series, Science Demonstrations and Live Science Theatre.

The new **Harcourt Teacher Leadership Center** offers multimedia resources, meeting space, broadband Internet connections and workspace for teachers. Experienced teachers-in-residence serve as mentors to pre-service and in-service educators coming to the Hall for professional development programs ranging from one-day workshops to three-week institutes. Over the previous two years, the Hall has experienced a staggering 93% increase in the demand for its teacher training and workshop programs. Last year alone, the Hall empowered 2,900 teachers with professional development training, hands-on inquiry-based teaching techniques, and concepts to encourage scientific and critical thinking in children. Other programs such as **Outreach Lesson Modeling** enable us to bring the Hall's resources into City classrooms. In addition, educators set up science lessons in their classrooms with the assistance of the Hall's **Science Rental Kits**. Approximately 200,000 schoolchildren benefit from the Hall's teacher training programs each year.

The **Science Technology Library** is a central resource center for teachers, parents, school workshops, and the daily *After-School Science Clubs*. The Science & Technology Library features high-speed Internet access, more than 7,000 science education-related books, periodicals, audiotapes, and a trained staff. All visitors can use the Library and Hall members are allowed to borrow materials.

In 2006-07, the **Virtual Visit**, the Hall's state-of-the-art two-way distance learning program, will be revamped and reinvigorated. This program has proved tremendously popular, with virtual visitors coming from Texas, Michigan, and Ohio as well as the New York City region. The results of an independent evaluation in 2002 demonstrated that Virtual Visit is a valuable addition to the classroom experience, stimulating critical thinking skills in students and even engaging those who do not normally participate in science class. With new funding from Verizon, we will enhance our capabilities to offer more Virtual Visits than ever before.

Program Evaluation

All education programs at the Hall are evaluated through self-assessments, surveys, and reports prepared by professional evaluation agencies. In addition, we conduct front-end and summative evaluations on our exhibits, as well as extensive prototyping exercises with colleagues, teachers, children and family groups.

Staffing

Dr. Alan Friedman joined the Hall as Director and CEO in 1986. In recognition of his leadership role in fostering science literacy in America, the American Association for the Advancement of Science (AAAS) honored him with its 1996 Award for Public Understanding of Science and Technology. Dr. Friedman is the first science museum director to receive this award, the previous recipients of which include Carl Sagan and E.O. Wilson. In 1997, he was elected a Fellow of the AAAS.

The Board of Trustees has become increasingly active under the leadership of Ivan Seidenberg, Chairman and CEO of Verizon Communications, who became Chairman of the Hall's Board in 1997. A new generation of civic and business leaders have joined in our efforts. This leadership is helping to make the Hall as visible, well regarded, and well supported in New York City as it has become nationally and internationally.

There are 86 full-time and part-time museum staff, 200 casual staff, and approximately 40 volunteers at the Hall. Staff is organized in functional departments led by the Vice Presidents of Education, Science, Public Programs, Planning and Development, Finance & Administration, and Facilities & Operations. These report to the Chief Operating Officer, who is responsible to the Director.

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