Since its founding at the 1964–65 New York World’s Fair, the New York Hall of Science (NYSCI) has inspired more than 7 million people—children, teachers and families—by offering creative, participatory ways to learn and encouraging people to explore their curiosity and nurture their creativity. Located in Queens, the most ethnically diverse county in the country, NYSCI welcomes 500,000 visitors each year and serves thousands more through outreach in schools, teacher professional development, and a variety of events, programs and research initiatives.

In its first 50 years, NYSCI has evolved into a leader in the science museum field, highly regarded for its exhibitions, programs and educational products. NYSCI engages people of all ages and experiences, particularly young people, in science, technology, engineering and math (STEM) by fostering the excitement of self-directed exploration and by tapping into the joy of learning intrinsic in play.

NYSCI’s transformative model for STEM not only invites broad participation, but also makes learning and engagement irresistible. NYSCI is also committed to training and supporting K–12 science teachers, recognizing and respecting the critical role educators play in sparking and maintaining students’ lifelong love of science.

NYSCI is at the vanguard of a transformation that is underway in STEM education, both in museums and classrooms. Informed by a strategy of engagement called Design-Make-Play, NYSCI’s approach is defined by open-ended exploration, imaginative learning, personal relevance, deep engagement and delight—the core ingredients that inspire passionate learners.
No area of education has received more attention in the last decade than the STEM subjects: science, technology, engineering and mathematics. In the 21st century, the skills, knowledge and habits of mind connected with STEM are essential, whether or not a person pursues a career in a STEM discipline, or simply hopes to prosper in a world linked by technology and made interdependent by the channels and networks that influence our daily lives. It is critical that STEM not remain the domain of a subset of the population but be integral to the education and lives of all citizens, despite their gender, socio-economic status, ethnicity and academic predisposition.

NYSCI is one of the nation’s leading science and technology centers and is known for exhibitions and programs that offer rich opportunities for exploration and social interaction. All of NYSCI’s initiatives are motivated by our core mission to broaden pathways into STEM for people of all backgrounds.

As a science center, we are free from the strictures of formal education settings. This enables us to transform the standard experience of science exploration most children receive in school to more innovative methods that are designed to promote experimentation and development. The challenge is showing the impact of such environments on children’s learning and then helping educators everywhere reproduce such environments back in their own classrooms. And perhaps the even greater challenge is to convince policymakers and lawmakers that by creating opportunities for students and teachers to experience the joy and exhilaration that comes from experimentation, tinkering, messing around and discovering what wasn’t there before, there is a greater potential for students to excel at STEM subjects.

STEM does not take root in the one-size-fits-all model of the industrial age; it is about wonder and discovery, asking questions, and experiencing failures. At its best, effective STEM learning and engagement should feel like an irresistible enterprise, allowing young people to marry their convictions and enthusiasms with opportunities to advance.

This is what we’re committed to at NYSCI. This is what we know resonates with students and educators. This is what inspires us to design, make and play. And this is what we see happening every day in our museum.

Margaret A. Honey, Ph.D.
President and CEO, NYSCI
NYSCI is at an exciting point in its 50-year history. Since its founding at the 1964–65 New York World’s Fair, NYSCI has gained an international reputation for groundbreaking exhibitions and educational programs that engage visitors in timely and relevant topics in scientific discovery: space exploration, chemistry, medicine, communications, technology, industry, design and countless other subjects. NYSCI has also emerged as a leader in preparing the next generation STEM workforce through initiatives in teacher professional development, youth mentoring and employment, learning sciences research and more.

To prepare for and guide the institution’s efforts in coming years, NYSCI has produced a five-year strategic plan that draws on data, information and advice gathered from a wide array of stakeholders, including education leaders, policymakers, philanthropic institutions and individuals, colleagues and loyal fans. The strategic planning process led to the development of three primary aims for the institution:

1. Expand NYSCI’s reach and reputation as a leader in the effort to transform STEM education.
2. Grow and diversify the institution’s base of financial support to ensure a stable, sustainable reserve of resources—both in terms of people and dollars—to support innovation in the next 50 years.
3. Deepen an institutional culture that is collaborative, strategic and united around a common organizing philosophy and brand.

NYSCI’s commitment to these three top-level objectives will ensure a focus on transforming STEM learning, adequate and diversified resources to realize its aspirations, and accountability and unity in advancing its vision.
Strategic Focus 1:
Transforming STEM Education

Over the past several years, NYSCI has embraced a philosophy called Design-Make-Play. **Design** emphasizes intentionality in problem solving and helps people see the possibilities in the world; **Make** highlights hands-on experience with materials, tools and processes and nurtures the development of skills and confidence; **Play** promotes intrinsic motivation and deep engagement. When combined, these strategies support open-ended exploration, imaginative learning, deep engagement and delight — ingredients that inspire passionate learners, critical thinkers and active citizens. Hallmarks of NYSCI’s Design-Make-Play approach include personal choice, iterative design and the construction of explanations and solutions. These and other Design-Make-Play characteristics are closely aligned with concepts and practices underscored in the Common Core Math and Next Generation Science Standards, and are dynamic vehicles for cultivating the kinds of creative problem solving that employers are looking for in their 21st century workforces.

Throughout all of its work, NYSCI seeks to give students an ever-expanding sense of their own abilities and knowledge. The problem-solving nature of Design-Make-Play is well suited to providing students with this kind of opportunity because it invites them to apply a wide variety of skills and knowledge to finding a possible solution. Design-Make-Play activities not only utilize current knowledge, they can also propel students to build new knowledge through the creative application of their skills and ingenuity.
Strategic Focus 2: Building for the Next 50 Years

Throughout the past five years, NYSCI has demonstrated great success in attracting restricted private and public funding — funding that has enabled NYSCI to grow and reshape in many positive ways — moving toward a set of experiences that support deeper engagement and deeper learning.

In recognition of its 50th anniversary, the Campaign for NYSCI was launched in 2010. This five-year, $50 million initiative was designed to help NYSCI deepen its connection to the immediate communities it serves in Queens and also develop its national reputation as a learning laboratory committed to transforming STEM education. The campaign surpassed its financial goal in 2014 and has been supported by leading foundations, 50 percent of which are new to NYSCI, and corporations, 30 percent of which are new to NYSCI. Beyond the campaign, NYSCI has attracted significant federal funds in the form of awards from the National Science Foundation, the National Institutes of Health, and the U.S. Department of Education’s Investing in Innovation (i3) programs, among other government supporters. NYSCI’s staff has grown from 257 to 297 and includes dozens of scientists and researchers, internationally recognized educators, award-winning exhibition developers, and a large staff devoted to youth empowerment and access.

As NYSCI plans for the future, it will be necessary to recalibrate the balance between restricted and unrestricted sources of income in order to make critical investments in museum operations and infrastructure. This diversification of revenues is also essential to attracting and retaining talented staff. Building new streams of unrestricted revenue — through sales and licensing of education programs, products and services, large-scale audience development initiatives, and new fundraising strategies — is vitally important to sustaining the institution’s growth.

<table>
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<tr>
<th>Change in Revenue — FY15 to FY19</th>
<th>Change in Expenses — FY15 to FY19</th>
<th>Diversification of Revenue — FY15 to FY19</th>
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<td>$17.9 million</td>
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- For the next five years, NYSCI will recalibrate the balance between restricted and unrestricted revenues.
- The diversification of revenues will enable NYSCI to make critical investments in museum operations, personnel and infrastructure.
Strategic Focus 3: Strengthening an Institutional Culture

Ensuring operational excellence by building an accountable and unified institutional culture and directing resources to support this work is critical for the achievement of NYSCI’s first two strategic goals. Equally important is the identification of what the institution values in terms of organizational culture. To that end, NYSCI values a culture that is:

Curious. We encourage and grow the human desire to explore, question and learn.

Inspirational. We motivate engagement and deeper learning through practices that invite wonder and exploration.

Open. We engage and learn from our visitors, local communities, educators, families, children, the broader scientific community and each other.

Adaptive. We encourage flexibility in ideas and institutional practices, and we embrace and consider continuous improvements in all aspects of our operations.

Informed. We welcome improvements to our own practices and services based on identified metrics and feedback from key audiences.
NYSCI’s ambition starts with an understanding of what successful scientists, technologists, engineers and mathematicians do. They don’t start with answers. They start with questions. They don’t start with textbooks and rules. They start with curiosity, with messing around and being close observers of what happens. STEM professionals learn as much, if not more, from their “failures” as their successes. At some level, they approach their work through the same principles that govern NYSCI’s commitment to Design-Make-Play — deep personal engagement, iterative design and the construction of explanations and solutions that lead to more questions.

NYSCI builds on learners’ motivations to play, explore and create to foster their active engagement with STEM. This work is accomplished in three interconnected ways: (1) through the museum as a vital place for learning, (2) through products that extend learning beyond the walls of the museum, and (3) through partnerships that enhance NYSCI’s impact on STEM learning and engagement in people’s day-to-day lives, in the classroom, in the workplace, and in their homes. The interconnectedness of place-products-partnerships makes NYSCI a particularly compelling learning laboratory in which to innovate.
Place: Developing and Offering Unforgettable Experiences That Engage, Unite and Inspire

Through its place, NYSCI offers exhibits and programs that use Design-Make-Play methodologies to deepen visitor engagement and create broad pathways of opportunity for youth to pursue STEM careers. NYSCI will continue to make significant changes to exhibition and program areas — moving toward a set of experiences that support deeper engagement and deeper learning.

The groundbreaking exhibition, Design Lab, is a multilayered experience in which visitors engage in engineering and tinkering activities that focus on the design process as well as STEM content like circuitry, structures, light and shadow.

Maker Space supports programming focused on building, designing and engineering through the use of high- and low-tech tools. Visitors create things that are driven by personal interests and work through exploration, trial and error, and iteration. The process of making is not just a means to an end, but has its own value — one that involves adapting, customizing and sharing with others so they can mold the do-it-yourself (DIY) process for personal or group needs.

Connected Worlds, NYSCI’s newest exhibition invites visitors to explore issues connected to environmental balance and the viability of ecosystems within the context of imaginative, immersive worlds. Through state-of-the-art sensor technologies, visitors can engage with any one of the six beautifully rendered environments that are created through projections and dynamic, real-time animations.
Design-Make-Play draws on a wide-range of research that shows that design-based thinking helps learners develop deep understanding of STEM concepts and supports the kinds of self-guided inquiry skills that are emphasized in the Common Core and Next Generation Science Standards. Making enables risk taking and experimentation in ways that promote students’ ownership over their learning. An emerging body of research indicates that instruction that is intellectually playful, meaning that it is organized around tasks that are open-ended and support varied strategies and diverse answers, is deeply absorbing for learners and supports social and intellectual curiosity.

Products: Changing How People Learn

Using its Design-Make-Play philosophy, NYSCI creates products designed to reach beyond the walls of the museum, creating resources that make STEM learning irresistible for students and teachers. The core principles embraced in carrying out this work include:

• **Putting people and play at the center** — NYSCI leverages kids’ natural instincts to engage playfully with things they find compelling.

• **Tackling difficult concepts** — NYSCI focuses on subjects that are often the most difficult for students to master, the stumbling blocks where students, especially in middle school, often lose their enthusiasm for STEM.

• **Encouraging divergent solutions** — Students are encouraged to engage in strategies where there’s no one right answer.

• **Providing a playful invitation** — NYSCI presents a low barrier to entry, a high ceiling of rich potential complexity, and a wide berth for creative expression of ideas.

• **Engaging kids as creators** — NYSCI engages kids as creators and makers, not just consumers, of content, materials and material objects.
Partnerships: Amplifying and Extending NYSCI’s Message

Like practicing scientists everywhere, NYSCI rarely works alone. Through collaborations with the White House Office of Science Technology Policy and organizations like the Network Science Center at West Point, NYSCI has produced conferences on relevant topics, which include learning and making and the science of big data. It also engages in high profile partnerships with international organizations such as Maker Media, NYSCI’s collaborator on the annual World Maker Faire, a two-day festival of DIY creativity, which attracts more than 80,000 people each year. Virtually all of NYSCI’s research and educational programs involve partners from universities and other formal and informal learning organizations.

In other instances partners provide the financial backing required for NYSCI’s work. The Walt Disney Company, Cognizant Technology Solutions, Verizon Communications and the Verizon Foundation, the Bill and Melinda Gates Foundation and others have been major supporters of the products, exhibitions and educational programs created in recent years. These organizations have missions that are closely aligned with NYSCI’s vision and they have a desire to see the United States regain its preeminence in creating STEM innovators, entrepreneurs and leaders. These partners recognize in NYSCI an institution that is breaking new ground and reversing longstanding beliefs about what is possible in STEM education.
NYSCI has identified five core audiences with whom it will primarily work and the outcome it seeks to achieve with each in its efforts to transform STEM learning.

**Visiting Public.** Grow loyal fans and promoters and have a positive impact on their engagement with science.

**Educators.** Cultivate teachers who encourage intellectual curiosity, adaptability and a passion for learning in their students.

**Students.** Inspire young people who are passionate about science and go into STEM careers.

**Community.** Become an indispensable resource for neighboring communities.

**Thought Leaders and Supporters.** Create a groundswell of support from the world’s leading scientists, to community boards and the U.S. Congress, to donors large and small.
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