



Museums for America

Sample Application MA-10-19-0252-19
Project Category: Lifelong Learning

Sciencenter

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| Amount awarded by IMLS: | \$202,163 |
| Amount of cost share: | \$207,486 |

Attached are the following components excerpted from the original application.

- Abstract
- Narrative
- Schedule of Completion

Please note that the instructions for preparing applications for the FY2020 Museums for America grant program differ from those that guided the preparation of FY2019 applications. Be sure to use the instructions in the [FY2020 Notice of Funding Opportunity](#) for the grant program and project category to which you are applying.

Sciencenter
Strengthening Rural Engagement in STEM
ABSTRACT

The Sciencenter proposes *Strengthening Rural Engagement in STEM*, a partnership project aimed at increasing rural engagement in STEM (science, technology, engineering, and math) and building the Sciencenter's capacity to meet the needs of our local and regional community. We will partner with Moravia Central School District and Groton Public Library, and collaborate with a group of advisors with expertise in reaching rural audiences, inquiry-based STEM, and/or program co-development with community partners.

Nationally, youth in rural areas are frequently identified as underserved in STEM. Poverty in rural areas is often as pronounced as it is in inner cities, with many of the same challenges related to education and student achievement as urban low-income areas; these challenges are exacerbated by geographic isolation and generational poverty that is more persistent than in urban areas. The psychological impacts of this poverty are particularly evident when it comes to STEM. Students from rural areas don't see themselves as "science" people and often associate science with "rocket scientists and engineers" - occupations linked with city life. And yet, with recent and projected job growth in rural areas in sectors like healthcare, manufacturing, and new entrepreneurial enterprises that depend on STEM-qualified employees, without access to high-quality STEM education and experiences, people living in rural communities will continue to fall behind. The Sciencenter sees these challenges play out in nearby rural communities, some of them as little as eight miles away from our Ithaca, NY museum.

To address these needs, we will use a co-development process with rural partner organizations to identify audience needs and ways of addressing those needs that increase access to STEM among rural audiences in our region, bringing the benefits of hands-on and inquiry-based STEM education to rural families and children. Our project will include the following activities: 1) information gathering; 2) co-development; 3) evaluation; 4) ongoing implementation; and 5) dissemination.

The project will benefit: 1) rural audiences of families and children; 2) our partner organizations in rural areas; and 3) the Sciencenter. We expect to reach at least 1,000 children and their families in rural communities that are within 60 miles of Ithaca during the project period and as a result:

Rural audiences of families and children will:

- See science as a process for learning about the world through experimentation and exploration that is relevant to their everyday lives.
- Have a greater number and diversity of opportunities to engage with STEM content where they live, work, and play.
- Have increased awareness about the Sciencenter and our programming.

Partner organizations will:

- See science as a process for learning about the world through experimentation and exploration that is relevant to people's everyday lives.
- View the Sciencenter as an important partner in efforts to engage and educate communities.

The Sciencenter will:

- Increase our capacity to meet needs of rural audiences by addressing barriers to access.
- Increase the depth of our partnerships in rural communities surrounding the Sciencenter.

The Sciencenter will work closely with Via Evaluation to track project progress and measure results. Project evaluators from Via Evaluation will train Sciencenter staff on data collection and recording methods, and provide periodic written summaries of the data analysis to help record and track project progress, measure success, and make changes to co-developed programs and activities as needed.

Sciencenter
Proposal to Museums for America
Strengthening Rural Engagement in STEM

The Sciencenter proposes *Strengthening Rural Engagement in STEM*, a partnership project aimed at increasing rural engagement in STEM (science, technology, engineering, and math) and building the Sciencenter's capacity to meet the needs of our local and regional community.

I. PROJECT JUSTIFICATION

What we are Proposing

Catalyzed by the Sciencenter's recently completed strategic plan that calls for "expanding opportunities for everyone to engage with science by removing barriers," with a specific goal to increase engagement among rural audiences, this project will use a model of co-development in which the Sciencenter works alongside and with rural partner organizations to develop STEM programs for families and children in rural communities within 60 miles of the Sciencenter. This includes deepening our existing partnerships and working with new partners to: 1) build our understanding of rural communities' needs around STEM; and 2) co-develop activities and programs with rural partners that meet those needs. We will evaluate our efforts iteratively with continuous feedback and improvement so that we best meet the needs identified.

Project Need

Nationally, youth in rural areas are frequently identified as underserved in STEM (MMAS, 2018). Poverty in rural areas is often as pronounced as it is in inner cities, with many of the same challenges related to education and student achievement as urban low-income areas; these challenges are exacerbated by geographic isolation. Rural school districts typically receive less funding per student than urban districts and because of the isolation factor, a greater proportion of that funding is allocated to transporting students across large areas (Gutierrez, 2016). And because of those large distances, many students spend a big part of their days on the bus - time that may have been spent in after-school programs or extracurricular activities. More funding going towards transportation means less money to spend on high-quality STEM education. Schools in rural areas have a difficult time attracting and retaining STEM-qualified teachers and often lack the basic science lab equipment (Avery, 2013; Yaffe, 2018) for hands-on experiences linked to long-term interest and engagement with STEM (Falk and Dierking, 2010).

Beyond geographic isolation, rural poverty is more likely than urban poverty to be persistent across generations - a fact that can profoundly impact children's views of themselves and their subsequent academic achievements and future aspirations (Tine, 2017). These psychological impacts are particularly evident when it comes to STEM (Abrams and Middleton, 2017). Students from rural areas don't see themselves as "science" people and often associate science with "rocket scientists and engineers" - occupations linked with city life (Yaffe, 2018). And yet, with recent and projected job growth in rural areas in sectors like healthcare, manufacturing, and new entrepreneurial enterprises that depend on STEM-qualified employees (CSC, 2014; Buffington, 2017), without access to high-quality STEM education and experiences, people living in rural communities will continue to fall behind.

The Sciencenter sees these challenges play out in nearby rural communities, some of them as little as eight miles away from our Ithaca, NY museum. Sara Knobel, director of the Groton Public Library in one of these communities, says, "The youth of Groton have fallen behind in the area of science and are thirsty for science themed lessons/activities" (personal communication, 2018).

These local needs were also highlighted in the Sciencenter's recent strategic planning process with stakeholders asking, "How can the Sciencenter increase engagement in STEM in rural areas that are so close to our museum?" and "What barriers exist to rural populations accessing high-quality STEM learning

opportunities?” This project will help the Sciencenter answer those questions by using a co-development process with rural partner organizations to identify audience needs and ways of addressing those needs that increase access to STEM among rural audiences in our region, bringing the benefits of hands-on and inquiry-based STEM education to rural families and children.

Who Benefits

The project will benefit: 1) rural audiences of families and children; 2) our partner organizations in rural areas; and 3) the Sciencenter. We expect each of these groups to benefit in the following ways:

Rural audiences of families and children will:

- See science as a process for learning about the world through experimentation and exploration that is relevant to their everyday lives.
- Have a greater number and diversity of opportunities to engage with STEM content where they live, work, and play.
- Have increased awareness about the Sciencenter and our programming.

Partner organizations will:

- See science as a process for learning about the world through experimentation and exploration that is relevant to people’s everyday lives.
- View the Sciencenter as an important partner in efforts to engage and educate communities.

The Sciencenter will:

- Increase our capacity to meet needs of rural audiences by addressing barriers to access.
- Increase the depth of our partnerships in rural communities surrounding the Sciencenter.

Advancing our Strategic Plan

In September 2018, the Sciencenter adopted a new strategic framework that will guide our work over the next five years. This plan is built around three directional indicators: science, community, and accessibility. Each of these indicators has related goals and objectives that will help us meet our updated mission *to cultivate a broad community of curious, confident, and critical thinkers*. This proposed project relates to goals under each of the three overarching directional indicators.

Science: A process for learning about the world through experimentation and exploration

Many students in rural areas underestimate their abilities in STEM because they don’t see themselves as “science” people; or they wrongly believe that STEM is a realm for “experts.” (Yaffe, 2018). At the Sciencenter, we view STEM as a process for learning about our world. Through open-ended, hands-on activities that encourage participants to ask questions, make observations, and experiment, we seek to counter the notion that STEM is content-specific and only for those with years of study. We will integrate this view into our work with partners and any co-developed activities or programming.

Community: People coming together to create, invent, experiment and connect

The Sciencenter seeks to be a community hub for science and to be a key contributor to the educational, cultural, social, and economic development of the region. Our strategic plan recognizes that we will need to increase our partnerships by at least 50% to achieve that goal. By deepening our relationships with existing partners, such as Moravia Central School District, and building new partnerships such as the one with Groton Public Library, this project will directly contribute to meeting goals outlined by our strategic plan.

Accessibility: Expanding the opportunities for everyone to engage with science by removing barriers

The Sciencenter has had record museum attendance with 112,000 visitors in the past 12 months, but we know there are still barriers for broadening access to our museum. Our strategic plan challenges us to identify and remove those barriers so that we engage an audience that reflects the diversity of our region. This includes

increasing our reach to rural audiences by 10%. Our proposed project will start with information gathering to ensure that we know the needs of local rural audiences. Co-developing programs with partners who are already trusted resources in their communities will help us meet these needs collaboratively.

By tying together each of the three directional indicators, this project will help us implement our new strategic framework and its vision, *a world where people explore, connect, and create through science*.

Addressing Goals of the Museums for America Program

This project will directly contribute to the Sciencenter’s “ability to serve our public” by broadening that public to reach new audiences of families and children in rural areas with a greater breadth and depth of programming than we currently provide. We anticipate that this project will have “institutional impact” by building the Sciencenter’s capacity to serve rural audiences and promote lifelong learning beyond our museum walls by reaching families and children, and partners in their communities.

II. PROJECT WORK PLAN

Specific Activities

Our project will include: 1) information gathering; 2) co-development; 3) evaluation; 4) ongoing implementation; and 5) dissemination.

Information Gathering: The Sciencenter will use a method of community outreach modeled on the Harwood Institute’s approach to working with communities to address societal problems. This model places people and community at the center of any change effort and focuses on collaboration (Harwood Institute, 2018). The Sciencenter was trained in this model through another IMLS-funded project led by Explora (Grant #MG-10-16-0079-16) and has used the method with success to implement programming for children with sensory processing disorders and their families. We will use a similar approach in this project by working with rural partners to host a series of community conversations. These conversations will be guided by questions based on the Sciencenter’s previous experience using the Harwood Institute approach such as “What do you want for your community?” and “What barriers exist to your community accessing STEM content?” These conversations will be supplemented by surveys and other audience analysis led by Via Evaluation, together allowing rural audiences to identify their own needs in regards to STEM.

We have recruited two rural partner organizations to initially work with us on this project: Moravia Central School District and Groton Public Library. However, we anticipate that our advisory board (see page 5) and information gathering will identify additional partners who may be critical to our project goals. Our project plan is designed to be flexible and adaptable so we can include new partners throughout the project.

Co-Development: Once we better know the barriers and needs facing rural communities, we will work with our partners to co-develop programming to address the identified needs. This process will include testing new activities, programs, and formats with our partners. We will start by collecting data on the impact of current programs and activities aimed at engaging rural audiences, including field trips to the Sciencenter and outreach events such as family science nights held at rural schools. We will then co-develop new or expanded programming that may include teacher professional development for elementary teachers in rural districts; activity kits for libraries, 4-H clubs, or other informal learning programs; and/or training for home-based daycare providers. True to the nature of co-development, we fully expect to create new programs and formats designed to best fit the needs of each individual collaboration.

Evaluation: Evaluation will focus on collecting ongoing feedback from participants as well as project partners. This will allow for iterative changes in programs and activities that are responsive to participant and partner feedback. Amy Puca of Via Evaluation will lead the evaluation process, working with the Sciencenter to design

questions and appropriate tools for data collection, including surveys, pre- and post-program interviews, and other ways to capture feedback from younger participants or those with limited literacy.

Via Evaluation will train Sciencenter staff in data collection and will work with the Sciencenter and our partners to analyze the data to make changes as necessary, helping to support the Sciencenter's and our partners' internal capacities. Via Evaluation will summarize results in short, written reports throughout the project, and in a final summative report to highlight key ideas or themes that emerge from evaluation data.

Ongoing Implementation: We will work with partners to implement co-developed programs and activities offsite at venues that have been identified through our advisory board, partners and information gathering as being accessible to families and children in rural areas and, where appropriate, onsite at the Sciencenter. We will refine and improve programs iteratively with feedback and evaluation data.

Dissemination: Based on the Sciencenter's experience in national networks of science centers and children's museums, we know that many of our peers are facing similar challenges in meaningfully reaching rural audiences with STEM content. As such, we will seek to share our experiences and results through presentations at the Association of Science-Technology Centers annual conferences. We will also share reports and other lessons learned on CAISE (Center for Advancement of Informal STEM Education) and other websites such as The Connectory.

Maturity Level

This project is in the exploratory phase. Although we are aware of some of the barriers to access for rural audiences, this project will help us better understand those challenges. We will then work with partners to develop and test new programming models, making refinements throughout the project period.

Project Risks

Rural audiences may be wary of the Sciencenter as a "Big City" institution that doesn't understand rural life. With a population of 30,000, Ithaca is hardly considered a big city on a national scale. However, families in our regional rural communities have told us that they do not feel comfortable in Ithaca and are overwhelmed by the traffic, limited parking, and fast-pace of the "city". We have accounted for this by working with partners who are trusted in their communities, as well as gathering a group of advisors (see page 5) who are rooted in rural communities or who have experience using the Harwood Institute's model of community engagement. We are intentionally using the Harwood Institute's approach because it puts participants at its center, taking the focus away from the Sciencenter and Ithaca.

Our project plan is built around a process of ongoing feedback so that we have time to test multiple approaches and refine these approaches to find what works best. We have specifically chosen to work with Via Evaluation as they have experience with (and a preference for) working with a model of ongoing feedback to allow for constant improvement and iteration. This will help ensure that the programs and activities developed really do keep participants from rural communities at the center of this project.

Finally, this project represents the Sciencenter's long-term investment in rural communities surrounding Ithaca. Even if this project doesn't result in a final model of programming, it will help us build capacity and infrastructure that will contribute to the Sciencenter's long-term engagement with rural communities.

Project Implementation

Who: The project will be led by *Michelle Kortenaar, VP of Strategic Development*. She will serve as the project director with responsibility for oversight and strategy, as well as partnership development. She has two decades of experience as a high school science teacher, as well as nearly 10 years of experience in informal science education, including directing the Sciencenter's education team for seven years. Michelle served as the project lead for our work using the Harwood Institute approach in co-developing programming for

audiences with sensory processing disorders and has used similar approaches with other underserved audiences such as Head Start teachers and families. *Bethany Resnick, Education Program Manager* will oversee the day-to-day functioning of the Sciencenter’s education team in managing this project. Bethany has five years of experience in informal science education and an MS in Biology. The Sciencenter will also hire a part-time *Outreach Coordinator* to lead project implementation, assisting in work with partners, developing and testing activities, and assisting with community conversations. *Judy Ammack, Volunteer Manager* will recruit and train volunteers to assist in program implementation in rural communities. Judy has a MS in Education and has been managing the team of over 100 Sciencenter volunteers since 2010.

Sciencenter staff will work with *Amy Puca, Senior Evaluator, Via Evaluation*. Amy will lead the project evaluation and develop appropriate tools for data collection. She will train Sciencenter staff in data collection and guide Sciencenter staff through the evaluation process, including data analysis. Amy has six years of experience leading evaluation in education, public health, social work and other related fields.

We will work with *Sara Knobel, Director, Groton Public Library (GPL)*, to co-develop and pilot new programming at GPL. Groton is a small town located approximately 15 miles from the Sciencenter with a population of 6,078 (U.S. Census, 2017). GPL serves as a community hub for Groton, with few other options for community gathering places or afterschool venues. Sara has been the librarian at GPL for eight years. We will also continue to work with *John Birmingham, Superintendent, Moravia Central School District*. In the past year, the Sciencenter worked with John and teachers at Moravia’s elementary school to develop a week of science programming. During this week, Sciencenter educators traveled to Moravia and delivered various, age-specific programs for every class at Millard Fillmore Elementary School in Moravia. The week was capped off by Sciencenter educators hosting a family science night for parents, children, and community members. We will build on this programming to further develop our relationship with teachers and families in Moravia.

The Sciencenter has gathered a group of advisors to help guide the project. Advisors will provide input throughout the project and have expertise in community outreach, STEM, and rural audiences. Our advisory board includes: *Kristin Leigh, Deputy Director of Community Engagement, Explora, Albuquerque, NM; Margo Martin, Superintendent, Groton Central Schools, Groton, NY; Sunshine Miller, Coordinator of Cooperative Enrichment Services, Tompkins-Seneca-Tioga BOCES, Ithaca, NY; Megan Tiffy, 4-H Youth, Family, and Community Development Issue Leader, Cornell Cooperative Extension, Ithaca, NY, and Lisa Warner, Science Teacher, Millard Fillmore Elementary School, Moravia, NY*. All advisors and project partners have submitted letters of support for this project (See Supporting Document 1).

We will also rely on the Sciencenter’s other long-standing local partners who work with rural communities, especially during the information gathering phase. This includes *Tompkins Community Action*, an agency providing social services to families living in poverty and with home-based visitation services for families in rural areas; and the *Child Development Council*, an agency that supports parents and families in need, including training of home-based daycares.

When: The project will take place from October 1, 2019 - September 30, 2022, as follows:

October 2019 - April 2020: Information Gathering

- Information gathering, community conversations, partner development to understand audience needs.
- Ongoing formative evaluation

May 2020 - April 2021: Co-Development with Partners

- Develop and test new activities, methods, programs specifically for rural audiences. This could result in: more regular programming at rural schools, libraries, or expanded programs at additional partner sites.
- Work with existing programs to refine programming or co-develop new programs/activities.

- Dissemination of lessons learned to ASTC, websites.

May 2021 - September 2022: Ongoing implementation

- Implementing programs with partners
- Collecting feedback from project partners and participants
- Data analysis
- Program refinement based on feedback and evaluation (formative evaluation)
- Dissemination of lessons learned to ASTC, websites

July 2022- September 2022: Summative Evaluation

- Summative evaluation
- Dissemination of lessons learned to ASTC, websites

Resources Needed to Carry-Out the Project: The project budget is \$407,190, \$203,243 requested from IMLS and \$203,947 contributed as cost-share. The cost-share is a combination of in-kind staff time and indirect costs, as well as participant support for existing programming for rural audiences that will inform this project. In addition to budgetary resources, we will also rely on expertise from Sciencenter staff, partners, and the advisory board. Our partners and advisory board members are formal and informal educators with experience working with rural communities, STEM, or both. The Sciencenter has 35 years of experience developing hands-on, interactive programming for children and families, as well as experience co-developing programs with partners.

Tracking Progress: Our evaluation plan (see full plan as Supporting Document 2) is built around iterative, continuous program improvement with ongoing feedback from partners and program participants. Project evaluators from Via Evaluation will train Sciencenter staff on data collection and recording methods and provide periodic written summaries of the data analysis to help record and track project progress. Specific tools for data collection may include surveys, observations, interviews, or other tools that can especially help capture youth feedback. These tools may include youth drawing pictures of what they learned or feedback walls that include opportunities for participants to write or draw about their experience.

Sharing Project Results

Results of the project evaluation will be written in a final summative report at the end of the project, as well as in smaller summaries throughout the project to help guide the project team. We anticipate sharing results at ASTC conferences in Years 2 and 3. We will invite at least one partner to attend the conference and submit joint session proposals to share the co-development process and the impacts on rural audiences. We will also post resources and evaluation reports on websites such as CAISE and The Connectory.

III. PROJECT RESULTS

Performance Measurement

The project aligns with the IMLS goal of Lifelong Learning. We will work with our project evaluator to collect data via surveys that can answer performance measure statements, specifically collecting and reporting data around the following performance measurement statement: “My understanding has increased as a result of this project.” This question will be incorporated into surveys and other data collection tools as appropriate.

Intended Results

We anticipate that the project will reach at least 1,000 children and their families in rural communities that are within 60 miles of Ithaca during the project period, and have the following short-term results. These results are also detailed in our project logic model (Supporting Document 3).

Short-Term Results

Rural audiences of children and families will:

- See science as a process for learning about the world through experimentation and exploration that is relevant to their everyday lives.
- Have a greater number of opportunities to engage with STEM content where they live, work, and play.
- Have increased awareness about the Sciencenter and onsite and offsite programming.

Rural partners will:

- See science as a process for learning about the world through experimentation and exploration that is relevant to people's everyday lives.
- View the Sciencenter as an important partner in efforts for engaged and educated communities.

The Sciencenter will:

- Increase our capacity to meet the needs of rural audiences by addressing barriers to access.
- Increase the depth of partnerships in rural communities surrounding the Sciencenter.

Expected Changes in Behavior

Long-term project impacts and changes in behavior are anticipated as follows:

Rural Audiences of Families and Children are curious, confident, critical thinkers that use science and science process skills in their everyday lives.

Rural partners have increased capacity to offer STEM programming in their communities.

Sciencenter serves a greater number of children and families from rural areas, both at the museum and through ongoing outreach and partnerships. In addition, the Sciencenter will be a more welcoming and inclusive space for a broader community of learners.

Tangible Products

The project will produce hands-on activities and other program components co-developed with partners. These resources will be posted on websites such as CAISE.

Sustaining Project Benefits

This project represents one of the first steps towards addressing goals in the Sciencenter's new strategic plan and so we have a long-term organizational commitment to sustaining this project after the proposed grant period. Funding from IMLS will allow the Sciencenter to invest in a part-time outreach coordinator. This will allow the Sciencenter to do the work needed to build lasting relationships in rural areas. This kind of time-intensive investment will only be needed in the first few years, after which we do not anticipate needing as much staff time. By rooting the project in partnerships and devoting staff time, we are building our own capacity but also that of our partners in the communities where we seek to make an impact, making it more likely that the relationships developed and strengthened during this project are sustained beyond the project period.

Our existing work with field trip programs and other partnerships in rural areas has attracted funding for things like an endowed field trip program and ongoing programs. We will work to build relationships with private and corporate funders who will similarly be interested in making long-term investments in this project.

