



Museums for America

Sample Application MA-11-17-0234-17

Project Category: Learning Experiences

Funding Level: \$0 - \$25,000

Discovery Center at Murfree Spring

Amount awarded by IMLS: \$24,988

Amount of cost share: \$0

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 FY2018 Museums for America grant program differ from those that guided the preparation of FY2017 applications. This year, the maximum that may be requested from IMLS is \$250,000. Be sure to use the instructions in the FY2018 Notice of Funding Opportunity for the grant program and project category to which you are applying.

Discovery Center
SPARK! Head Start: Connecting Science & Literacy for Early Learners
Abstract

The Discovery Center at Murfree Spring in partnership with Mid-Cumberland Head Start proposes a 2-year *Museums for America 'Learning Experiences'* project. *SPARK! Head Start* (SHS) is an innovative approach to reaching under-resourced early learners, families, and teachers in Rutherford County, Tennessee, by integrating and leveraging 1) the exhibits, programs, and staff expertise of a STEM-focused children's museum that promotes literacy and science for preK children and their parent/caregivers in a program called SPARK!, 2) the powerful science and literacy resources of an established NSF- and IMLS-funded program that integrates science with children's books as an approachable access point for both families and educators who are unfamiliar with and/or intimidated by science, and 3) local Head Start programs whose children and staff are well situated to benefit from and implement the resources and modeling of inquiry-based science and family engagement efforts.

Specifically, SHS will:

1. provide rich science and literacy experiences to children ages 3-5;
2. build the capacity of teachers to integrate and embed literacy and science process skills through hands-on STEM activities linked to children's literature and best practices;
3. develop two additional programs, using the existing model, that have particular relevance to middle TN;
4. increase family engagement in STEM at partnering Head Start centers and as visitors to DC; and
5. learn from and refine the SHS model in preparation for expansion to the remaining counties within MCHS's jurisdiction.

There is growing evidence that early learning opportunities, especially in literacy and science, play a critical role in preparing children not only for kindergarten but for success and achievement in school and throughout their lives. SHS will support early learners' cognition and literacy skills, areas identified through recent Head Start assessments as below expectations, through exposure to engaging, inquiry-based activities, and by helping influential adults – both in school and out - develop their capacity to promote STEM and literacy learning.

SHS programs are expected to benefit a) Head Start children and families who, through their experiences in a STEM and literacy-rich environment, increase their interest, kindergarten readiness, reasoning skills, and appreciation for books; b) Head Start teachers who will benefit from the modeling of science and literacy skill integration, and the support they receive in continued implementation of the resources; and c) DC staff as a result of the capacity building opportunities inherent in curriculum development and delivery, and the learning that results in adapting an established program to better meet the affordances and constraints of community Head Start centers.

SHS intends to develop and provide inclusive and accessible learning opportunities, and train and develop museum [and Head Start] professionals. Relevant performance measure statements are "*My understanding has increased as a result of this program/training*" and "*I am confident I can apply what I learned in this program/training*". SHS impacts will be measured using instruments developed and validated for LEAP into Science. Performance statements will be embedded in the instruments, as appropriate, and will include surveys, interviews and focus groups with educators and parent/caregivers and classroom observations. Intended *outcomes for educators* include increased interest and engagement in science and literacy learning; increased understanding of the ways in which science inquiry and reading strategies support one another; proficiency and increased confidence facilitating integrated reading and informal science learning with early learners specifically; and increased awareness of how various types of literature can be used to introduce, reinforce, and extend learning at the pre-K level. *Outcomes for parents/caregivers* include increased engagement in reading and science learning in informal settings and at home. *PreK* children are expected to develop positive attitudes toward science; demonstrate curiosity, enjoyment, and creativity; and exhibit science process skills such as exploring, experimenting, observing, questioning, describing, and collaborating.

As a result of its partnership with the Mid-Cumberland Head Start, the Discovery Center expects to better serve under-resourced early learners, families, and teachers in the community in ways that enhance the capacity of both the Head Starts and the museum to integrate best practices in the facilitation of STEM and literacy programs.

SPARK! Head Start: Connecting Science & Literacy for Early Learners

The Discovery Center at Murfree Spring respectfully submits this proposal to the IMLS for a 2-year *Museums for America* grant in the *Learning Experiences* category. The proposed project, *SPARK! Head Start*, will enable the Discovery Center at Murfree Spring to partner with the Mid-Cumberland Head Start to better serve under-resourced early learners, families, and teachers in the community through a science and literacy program. Discovery Center has become a proven leader in providing hands-on, experiential learning for early learners and their parents evident in its successful SPARK! (**S**TEAM **P**lay **A**chieves **R**eal **K**nowledge) program. *SPARK! Head Start* combines the strengths of an effective middle Tennessee Head Start program, the Discovery Center's expertise in supporting early learners and their parents, and the curricular and training resources of an NSF & IMLS-funded program in science and literacy. *SPARK! Head Start* will increase connections between science and literacy skills for 132 pre-K children ages 3-5 and enhance the capacity of 16 teachers and 2 administrators within Rutherford County Head Starts to facilitate science and literacy programs.

The Discovery Center at Murfree Spring (DC), incorporated as The Children's Museum Corporation of Rutherford County, opened in 1987. A small, non-profit children's museum that is fast becoming a leader in providing meaningful informal STEM education experiences across the region, DC strives to expand the concept of what a children's museum can be. It is committed to seeking community input so that what is truly valuable, relevant, and important is always at the forefront of institutional decisions and initiatives. In addition to 125,000 visitors annually, DC offers a range of science-rich experiences for families, youth, and adults both as museum visitors and through a range of outreach efforts. Examples of the ways in which DC is addressing specific community needs and desires include science programming for children in rural area schools using DC's mobile STEAM Bus (initially funded by IMLS and now supported by United Way); DC's Special Needs Council; and the teen Youth Council. Commitment to the critical importance of engaging children at a young age is evident in DC's successful and well-attended SPARK! program, offered in the museum every Monday and Tuesday throughout the school year for 35 weeks. Each week serves approximately 40 children and family members, and focuses on a different theme that includes a book, activity, and snack, along with time in the museum.

Mid-Cumberland Community Action Agency (MCCAA) fosters economic independence for low-income people and communities in middle Tennessee. Mid-Cumberland Head Start (MCHS), offered since 1970, is one of the more successful ways they accomplish this goal. Rutherford County, the focus of this proposal, hosts two sites – one in Murfreesboro and one in Smyrna. MCHS serves 8 counties across middle Tennessee and also has a partnership with the Murfreesboro City Schools with six additional locations providing Head Start services throughout the city. SPARK! Head Start has the potential to expand direct service to children and capacity building efforts to these additional locations in the future.

LEAP into Science (LEAP) originated in 2007 through a museum-library partnership in Philadelphia, designed to engage children and families in science and literacy learning by integrating children's books with hands-on science activities. The Franklin Institute was awarded two NSF grants, followed by an IMLS *National Leadership Grant for Museums* in 2012, to fund *LEAP into Science: Cultivating Early Learning in Science and Literacy*. PreK training and resources were developed to engage early learners and further demonstrate the effectiveness of integrating children's books, informal science, and collaborative partnerships to engage children and parents/caregivers in underserved communities in science and literacy learning. LEAP is now in 12 sites across the country, involving partnerships with 29 informal institutions, including DC, and has served over 85,000 children and adults representing diverse populations across the U.S. Evaluation and research findings indicate that it has successfully cultivated interest and skills in science and literacy for underserved children and families; and improved confidence and facilitation skills in museum, library, and out-of-school educators. Program strengths include high-quality evidence-based curricula; professional development that models inquiry and open-ended exploration; and flexibility and adaptability to fit institutional needs and goals (Ancelet & Luke, 2013).

1. PROJECT JUSTIFICATION

What Do You Propose to Do?

SPARK! Head Start (SHS) proposes an innovative approach to reaching under-resourced early learners, families,

and teachers in Rutherford County, Tennessee, by integrating and leveraging 1) the powerful science and literacy resources of *LEAP* that integrate science with children's books as an approachable access point for both families and educators who are unfamiliar with and/or intimidated by science, 2) the exhibits, programs, and staff expertise of a STEM-focused children's museum and, 3) local Head Start programs whose children and staff are well situated to benefit from and implement the resources and modeling of inquiry-based science and family engagement efforts. Specifically, SHS will:

1. provide rich science and literacy experiences to children ages 3-5;
2. build the capacity of teachers to integrate and embed literacy and science process skills through hands-on STEM activities linked to children's literature and best practices;
3. develop two additional programs, using the existing model, that have particular relevance to middle TN;
4. increase family engagement in STEM at partnering Head Start centers and as visitors to DC; and
5. learn from and refine the SPARK! HS model in preparation for expansion to the remaining counties within MCHS's jurisdiction.

SHS will focus on Rutherford County's Murfreesboro Head Start program in the first year, and will expand to the Smyrna Head Start in the second year. Year 1 will focus on piloting the *LEAP* activities, aligning program activities with established free-time, reading, and activity time slots at the Murfreesboro Head Start, and formatively evaluating an additional two newly developed sessions having direct application to the middle Tennessee region. Implementation will expand to Smyrna in Year 2, while continuing in Murfreesboro, with supports provided to teachers in Murfreesboro as they build their capacity to lead the programs for a new set of students.

What need, problem, or challenge will SHS address, and how was it identified?

Need for Early Learning: There is growing evidence supporting the need for and benefits of early learning opportunities for children prior to kindergarten. Research on school readiness (Hair, et.al, 2006) and early math and science achievement indicate "we are not giving young children the support they need to be 'STEM Smart' (CADRE, 2013)". At an early age, all children have the capacity and inclination to wonder and explore. As reported by Pattison, et. al (2016): "There is growing evidence that before they enter school, children have already begun to develop enduring interests, including STEM-related interests, that persist over time and have implications for long-term learning trajectories (e.g., Alexander, Johnson, & Kelley, 2012; Fisher, Dobbs-Oates, Doctoroff, & Arnold, 2012; Patrick, Mantzicopoulos, Samarapungavan, & French, 2008)". The National Science Teacher Association (2014) developed a position statement, endorsed by National Association for the Education of Young Children (NAEYC), that addresses the need for critical support of the early learner science. Their recommendations include: nurturing young children's curiosity; providing experiences in the early years that focus on the content and practices of science; providing a learning environment that encourages children to ask questions, plan investigations, and record and discuss findings; and recognizing that science provides a purposeful context for developing literacy skills and concepts, including speaking, listening, vocabulary development, and many others.

Head Start, DC's partner in SHS, is aimed specifically at high-risk children, typically those from low-income, single parent or unemployed households. Tennessee's Head Start programs serve more than 20,000 children and their families every year. In Rutherford County, 28.8% of children under the age of 5 live in a state of poverty (Foret, 2014). "Young children's inclination to be curious, explore, experiment, ask questions, and develop their own theories about the world makes science an important domain for enhancing learning and school success" (Head Start Learning Outcomes Framework (HSLOF); 2015). Head Start's 2015 revision of HSLOF reflects a critical opportunity to engage children as early as possible. A baseline assessment of 4-year olds, just 6 weeks into the MCHS program, reinforces this need. Children fell below widely-held expectations for development in all areas, but most severely in mathematics (72% of children were below expectations), cognitive development (54% below), and literacy (51% below expectations). Natural scientists from the start, young children have the capacity for conceptual learning and the ability to use critical skills (NRC 2007, NRC 2012) - skills that are inherent in both science and reading and that benefit from cultivation.

Connecting Science & Literacy: Literacy is a gatekeeper to children's achievement generally, and especially in science. Challenges, evident by the third-grade if not before, are associated with low chances for success if not remediated

and high drop out potential (IMLS, 2013). Students from under-resourced urban and rural areas are at very high risk for underperforming in science and literacy (Campos Research Strategy, 2014; Ejiwale, 2013; Neuman & Celano, 2006ancele). The use of literacy skills while learning science content extends and expands scientific reasoning (Haggood & Palincsar, 2007); increases vocabulary, comprehension, and other language skills, by communicating about what they see, hear, and discover (Casteel & Isom, 1994; Leung, 2008). Integrating hands-on science with reading aloud improves scientific comprehension and retention of science vocabulary (Leung, 2008), and provides an opportunity to explore the parallel processes of each (Casteel & Isom, 1994). This integration provides multiple access points for children to develop scientific ideas while improving literacy skills (Douglas et al., 2006; Ford, 2006; Moje et al., 2001; Oliveira, 2015; Varelas & Pappas, 2006; Varelas et. al. 2014).

Need for High Quality, Integrated Learning Experiences: In their call to action, NAEYC (2013) identifies the importance of professional development in order to insure the high quality early experiences that make a difference in children's lifelong academic and social success, along with insufficiencies, including the need for resources that "create an education continuum, grounded in our knowledge of child development, that addresses appropriate standards, curricula, and assessments, along with the specialized teacher professional preparation and support, and with comprehensive services for children and families." Studies show that early childhood and elementary educators are often uncomfortable with the subject of science and unsure of how to best facilitate science learning for children (Luke, Bronnenkant, & Stein, 2004; NRC, 2007). Moreover, they typically lack the knowledge and resources to engage parents/caregivers in their children's science learning. Additionally, research shows the importance of parent involvement in children's science learning at an early age. Experiences that children and families do together form the building blocks for later science learning (Callanan & Oakes, 1992; Gelman & Kalish, 2006; National Research Council, 2007; Luke & McCreedy, 2011; 2012). As IMLS outlined in *Growing Young Minds* (2013), needed are "connectors that bridge the generations and bring children, parents, and families together in fun and nonthreatening settings that build mutual knowledge, skills, and self-efficacy" (p. 8). Work with Head Start families (Pattison, 2014; Pattison & Dierking, 2015, 2016) has illustrated some of the complex ways family support and engagement with a topic can play a critical role in the interest development and pursuit of children in specific topics or activities. The result: SHS will support early learners' cognition and literacy skills through exposure to engaging activities, and by helping influential adults – both in school and out - develop their capacity to promote STEM and literacy learning.

Who Will Benefit from SHS?

SHS stands to benefit multiple audiences. By integrating science and literacy learning for pre-K audiences, SHS will help address the kindergarten readiness gap through access to books, STEM and literacy-rich environments, and informal programs for parents/caregivers and children. Head Start teachers will benefit from the modeling of skill integration, and subsequently, from the support they receive in continued implementation of the resources. Finally, DC will benefit from the opportunity to adapt an established program to better meet the needs of local Head Starts, and to apply these lessons to two new curricular resources that have the potential to be shared locally and with national LEAP network members invested in serving early learners, especially in Head Start settings.

How Will Your Project Advance Discovery Center's Strategic Plan?

Embedded in DC's 2017-2020 strategic plan is a commitment to providing hands-on exhibits and programs to enrich the experiences of everyone in the community. Providing formal programming opportunities for groups with stated educational objectives, facilitating opportunities for visitors of all ages to learn through hands-on experience and interaction, and expanding educational outreach that reflects the growth and changing demographics of middle Tennessee are priorities. SHS is aligned with three major tasks identified in DC's strategic plan: 1) To expand partnerships with regional public and private schools, 2) partner with local school systems to provide training and support to parents and families, and 3) offer ongoing professional development opportunities to teachers and informal education providers.. DC's vision is to build a community with the courage to ask thoughtful questions, the drive to find creative solutions, and the confidence to implement positive changes. By placing greater focus on preK learners, this IMLS-funded project will expand institutional and staff capacity to serve the early-childhood community, create more engaging learning experiences for families, and further our mission to engage curious minds to fuel the future.

How Will SHS Address the Goals of MFA and the Learning Experiences project category?.

SHS is aligned with the Learning Experiences category, which supports IMLS' goal of placing the learner at the center and supporting engaging experiences in and by museums. DC, in partnership with MCHS, believes in their ability to “open the door to meaningful knowledge and enhanced inquiry skills for people of all ages and backgrounds through multi-sensory learning, discovery, critical thinking, and problem solving.” Through its museum/head start collaboration, SHS will serve an under-resourced, partially rural, underserved population of children and families; leverage a successful, evidenced-based science and literacy program that promotes meaningful inquiry-based interactions; and provide professional development opportunities that leverage STEM and children’s books to strengthen early learning best practices. By integrating programs designed to specifically engage families, SHS aims to promote cross-generational, family engagement in children’s learning.

2. PROJECT WORK PLAN

What specific activities, including evaluation and performance measurements, will you carry out?

This 24-month project work plan includes time for DC and MCHS staff and educators to plan, evaluate, and carry out all aspects of the project in ways that will strengthen and expand programmatic offerings for preK students, build the capacity of teachers to integrate STEM and literacy for early learners, and position DC and MCHS for expansion to future county head starts in the future. These activities include:

- Implementation of 8 science and literacy sessions:
 - a. LEAP sessions, previously piloted and evaluated, for children ages three to five:
 - i. 4 classes of 18 3-5 year olds in Murfreesboro, TN (Jan-June 2018) and (August 2018–June 2019)
 - ii. 3 classes of 20 3-5 year olds in Smyrna (September 2018-May 2019).
 - b. Two additional program sessions and materials that will include appropriate books and activities which will draw upon DC expertise and regional areas of interest.
- Two 2-hour curriculum review panels/training sessions with Head Start teachers (Dec. 2017, Aug. 2018)
- Annual Family events: DC (May 2018 & 2019); Murfreesboro (May 2018 & 2019); & Smyrna (May 2019)
- Program evaluation activities:
 - a. Formative evaluation of the 2 new regionally-linked workshop resources will be conducted by staff.
 - b. Summative evaluation & report will draw upon tools developed for LEAP; the report will be prepared by the Project Director in consultation with past evaluator for LEAP preK.
 - c. Tools include educator surveys, parent focus groups, workshop session observations, and interviews.

The science and literacy resources are rooted in an inquiry-based approach that integrates children’s picture books, science themes and hands-on science activities that, together, encourage open-ended exploration. Designed to inspire curiosity through exploring everyday scientific phenomena, program activities provide opportunities for children and caregivers to feel like scientists together. SHS will begin with six 1-hour evidence-based LEAP workshops tailored to preK children (ages 3-5) that focus on water, sound, light and shadow, balance, measurement, and air/wind. Two additional workshops that draw on community-related themes will be developed (e.g. environmental education using Murfree Springs wetlands; NSF-funded *My Sky Tonight: Early Childhood Pathways to Astronomy*; DC’s TN-Ties, a program focused on Tennessee Native Americans). Each highlights key vocabulary paired with a “story time” read aloud and multisensory age-appropriate explorations. Family workshops aligned to the preK workshop themes that engage intergenerational learners and families of all ages will occur at each site during the year. A series of table top activities linked to children’s books, family workshops promote intergenerational learning and will be aligned with the Head Start Learning Opportunities Framework.

SHS will draw from the documented training success of LEAP, which led to increased comfort, confidence and capacity to facilitating science and literacy learning. Training will enable Head Start educators to feel comfortable with questioning techniques and scientific exploration, as well as with children’s books and science activities. Training resources support skill building in literacy and science instruction, emphasize strategies for the early learner, and include paper, video, and web-based resources. Modeling facilitation and collaborative reflection by the

teacher and the facilitator throughout the program will build their capacity to integrate and embed literacy and science process skills through hands-on STEM activities linked to children's literature and best practices. Science provides opportunities for exposure to rich vocabulary, collaboration with peers and family members, and fosters a sense of curiosity (HSELF, 2015).

Evaluation: Overarching evaluation questions about SHS include:

- To what degree are educators impacted from their SHS experience?
- To what degree are parents / caregivers of early learners impacted by their participation in programming?
- To what degree do teachers and parents of early learners perceive children are benefiting from their participation in the preK programming?

Teachers' reactions to the curriculum and structuring of the components to match their school-day schedule, and the corresponding training sessions, will be gathered by interview and questionnaire. In addition to the Performance Measurement Statements (described below), indicators will include teachers' understanding of key content and strategies, and their comfort level in using such strategies with pre-K children. Findings will inform our understanding of the needs specific to MCHS, their teachers, and parents. Revisions will be made as needed. If necessary, additional training resources will be developed to help address the specific schedules, needs and community at MCHS centers. Surveys developed for LEAP will be utilized, including 1) a retrospective pre/post, web-based questionnaire with educators, and 2) a post-program, written questionnaire with parents/caregivers following their participation in a family workshop. Summative evaluation will examine the nature of teachers' engagement in the program and the ways in which the training and implementation of resources enhances their perceived capacity to engage early learners and their parents/caregivers in science learning. Baseline data will be collected at the beginning of each year, to document teachers' initial science attitudes, knowledge, and teaching skills, as well as their engagement in science-rich learning activities. Corresponding post-project data will be collected at the end of Year 1 & 2.

What are the risks to the project and are they accounted for in the work plan?

Risks include staff turnover and classroom restructuring. Although training and support offered in Year 1 for Murfreesboro teachers is expected to support their continued success and implementation in Year 2, turnover is always a concern. Participation of MCHS administrators responsible for training, and stipends for training new staff in Year 2 accounts for this possibility. MCHS classrooms are currently a mix of 3-year-old only classes and classes with three-to-five year old students integrated. The state is increasing its emphasis financially on early childhood education programs for age three, which may result in realignment and increase in three-year-old only classrooms in centers. This may require some revisions and adaptations to include effective strategies for implementing the program with this younger age group, which we will do collaboratively.

Who will plan, implement, and manage your project?

The SHS leadership team includes **Tammy Miller**, Staff Development and Education Manager at Mid-Cumberland Head Start, DC's **Katie Woodward**, Early Childhood Coordinator, and **Dr. Dale McCreedy**, Vice President of Community and Audience Engagement, past PI of 3 LEAP into Science grants, and SHS Lead. The team will work collaboratively to plan and implement workshops, training sessions and events.

Tammy Miller, a contributor to this proposal, sees this effort as aligned with her responsibilities and passions, and will spearhead future efforts with MCHS. As she is already compensated through Federal Head Start grants, labor dollars for her are not included in this grant proposal. Ms. Miller will work with Discovery Center to facilitate the integration of the SHS resources into the 3-5 year old classrooms. She will insure that a) SHS is aligned with MCHS program structures and expectations; b) teachers and appropriate administrators are involved as collaborators in the program discussions and development, and attend the two training workshops; c) there are adequate communications to teachers and parents about SHS programs, expectations and events; and that d) the program evaluation is supported.

Katie Woodward joined the Discovery Center in 2013 with a degree in early childhood and family studies. She currently develops and facilitates all programs for SPARK! at the DC. She will be trained in and responsible for implementing the 6 science and literacy workshops, as well as spearheading the development of two additional workshops, which will draw upon her experiences in SPARK!, ASP's preK astronomy program, and leading field studies for young children in DC's wet lands. She will manage DC's Visitor Services staff during SHS family events.

Dale McCreedy, Ph.D., formerly at The Franklin Institute, conceived and led *LEAP into Science* and served as the Principal Investigator for its 2 NSF and 1 IMLS grants. She has experience developing curriculum and training resources, leading training workshops, and working with evaluators and researchers, and thus will oversee all financial, programmatic, and evaluation aspects of the project, and will be responsible for all reporting.

When and in what sequence will your activities occur?

SHS is a two-year project that will begin in October 2017 and run through September 2019. October to December will be a time for planning and meeting with teachers and administrators to review the curriculum and classroom structures, and for DC staff to learn about the daily operations of each class. SHS will focus first on Rutherford County's Murfreesboro Head Start center, which has four 3-5-year-old classes. Year 1 will focus on orienting teachers to the goals of the program, piloting the science and literacy activities, aligning program activities with established free-time, reading, and activity time slots at the Murfreesboro Head Start, and formatively evaluating an additional two science and literacy activities having direct application to the middle Tennessee region. The Early Childhood Coordinator will dedicate one day a week to this program; working with 2 classes for eight weeks and then repeating with the other two in order to reach all four Murfreesboro 3-5 year old classes. Holding two eight-week sessions during the spring semester, one after another, will allow time for reflection and adaptations between rounds of implementation. Implementation of the 8 science and literacy sessions will expand to Smyrna in fall of Year 2, distributed across the school year in order to reach all of the 3-5-year old classes. Additionally, sessions will continue in Murfreesboro, with supports provided to teachers as they lead the programs for a new set of students. Evaluation will be conducted throughout the grant period, beginning with the pre-program curriculum training for Head Start faculty in late Fall of 2017. Family events will occur each year, once at the museum and once at each Center. The timing of this will be determined in conjunction with center staff and their families.

What financial, personnel, and other resources will you need to carry out the activities?

DC, a member of the LEAP network, has received training to implement the program internally. However, this proposal for IMLS funds reflects the need to cover activity materials and children's books, labor costs, and travel associated with expanding the program and role of DC's Early Childhood Coordinator to include collaborative efforts and session facilitation with seven Head Start classes. Additionally, the budget includes stipends for Head Start teachers for two two-hour trainings, Visitor Services staff and materials for annual family events at the Discovery Center and both Head Start Centers, and evaluation efforts. Based on previous experiences, 1020 staff hours are anticipated to complete SHS. DC has demonstrated its capacity to carry out project activities within approved budgets in previous Federal awards, including six IMLS grants (2002, 2008, 2009, 2012, 2013, and 2015).

How will you track your progress toward achieving your intended results?

Project Director Dr. Dale McCreedy, in collaboration with key project staff, will review progress on SHS project activities and expenditures on a monthly basis. This process will ensure that the project remains on track and/or can be appropriately adjusted in a timely fashion. In addition, evaluation data will provide an opportunity to make programmatic adaptations, if needed, at the conclusion of Year 1's implementation in Murfreesboro that will inform Year 2 implementation and expansion. The DC's quarterly billing cycle will provide regular opportunities to compare actual expenditures to the projected SHS budget.

How and with whom will we share SHS's results?

The DC is part of an established network of 29 informal institutions across 12 national sites that implement *LEAP* programs. This network, spearheaded by The Franklin Institute, will stand to benefit from the programs developed by DC and the lessons learned in partnering with area Head Start centers. Opportunities for

presentations targeting early learning professionals and practitioners in the region's non-profit arena include but are not limited to Tennessee Association of Museums, Tennessee Association for Children's Early Education (TACEE), the Southern Early Childhood Association (SECA), and the Rutherford Association for the Education of Young Children (RAEYC). Presentations and articles will be submitted to these groups for further dissemination. A broader local public audience will be made aware of DC's partnership with MCHS through media coverage, DC's website, MCHS newsletters and targeted internal communications, and social media accounts, including the DC blog (<http://www.exploredc.org/blog>).

3. PROJECT RESULTS

Performance Measure Statement(s) for SHS: collecting and reporting the corresponding data.

SHS, a Learning Experiences Project, will provide educational program for children and families, and professional development for educators. There are two Performance Goals, i.e. 1) to develop and provide inclusive and accessible learning opportunities, and 2) to train and develop museum [and Head Start] professionals. The performance measure statements "*My understanding has increased as a result of this program/training*" and "*I am confident I can apply what I learned in this program/training*" will be embedded in the evaluation instruments, which include surveys, interviews and focus groups with the educators. During this process, the number of total responses, number of responses per answer option, and number of non-responses will be documented. SHS goals of increasing educators' interest and capacity to facilitate science and literacy learning will be indicative of successful program training.

SHS's intended results that will address the need, problem, or challenge identified.

Past program evaluation and research results indicate that the proposed curricular resources have been effective in supporting STEM-related goals for early learners. DC will leverage SHS program and training resources to build its capacity to better address the need for enhanced science and literacy programming for early learners across the region. SHS is designed to meet MCHS's need for professional development in the integration of STEM and literacy, and their challenge of helping children to meet and/or exceed expectations for kindergarten readiness and lifetime success. Additionally, MCHS challenging commitment to effectively engage families will be supported through site-based experiential programs and visits to the DC.

How will the knowledge, skills, behaviors, and/or attitudes of the intended audience change?

As a result of participation in SHS, preK children will develop positive attitudes toward science; demonstrate curiosity, interest, focus, understanding, enjoyment, creativity, and inspiration; and exhibit skills in exploring, experimenting, observing, cooperating, questioning, predicting, explaining, describing, and collaborating. These outcomes are aligned with previous LEAP studies (Ancelet, 2014a, 2014b, 2016; Ancelet & Luke, 2013). Project outcomes for the Head Start educators include: increased interest and engagement in science and literacy learning; increased understanding of the ways in which science inquiry and reading strategies support one another; proficiency and increased confidence with strategies for facilitating integrated reading and informal science learning with early learners specifically; and increased awareness of how various types of literature can be used to introduce, reinforce, and extend learning at the pre-K level. Outcomes for parents/caregivers include increased engagement in reading and science learning in informal settings, and at home.

What tangible products will result from your project?

At the end of the project, eight preK resources will have been piloted and adapted to meet the considerations of the typical 3-5 year old Head Start classroom. Centers will have held a STEM & literacy family event and will have activities to implement others. Training resources will be available should MCHS staff choose to (re)train staff.

How will you sustain the benefit(s) of your project? –

The depth of staff and administrators trained on the resources, the clarity of the curricular resources, and the easily and inexpensively replenished materials makes continuity of SHS very likely. MCHS and its teachers will have an established a history of program implementation, continued support as needed, from DC, and access to free family days.

