Museums for America Grants

Sample Application MA-245768-OMS-20
Project Category: Lifelong Learning

Imagination Station

Amount awarded by IMLS:	$250,000
Amount of cost share:	$289,929

The project description can be viewed in the IMLS Awarded Grants Search:
https://www.imls.gov/grants/awarded/ma-245768-oms-20

Attached are the following components excerpted from the original application.

- Narrative
- Schedule of Completion

Please note that the instructions for preparing applications for the FY2021 Museums for America grant program differ from those that guided the preparation of FY2020 applications. Be sure to use the instructions in the Notice of Funding Opportunity for the grant program and project category to which you are applying.

Project Justification

Imagination Station, Toledo's science center, requests $250,000 from the Institute of Museum and Library Services (IMLS) Museums for America program to address barriers to science, technology, engineering and math (STEM) education and promote a lifelong love of these subjects in our community. Our project, entitled **Toledo Tinkers: Through a Child's Eyes**, supports the development of an outreach curriculum delivered using a mobile tinkering lab. The curriculum is designed to help children ages 11-13 and their families establish personal connections with making and tinkering. A tangible result of the project will be the creation of a community narrative exhibition honoring those connections. Making and tinkering activities engage students in hands-on, open-ended skill building projects that encourage innovative thinking and problem solving. They are powerful tools for engaging children and families with STEM education and its inquiry-based learning methods. **Toledo Tinkers: Through a Child's Eyes** strengthens partnerships with organizations serving children in our community and deepens the science center's capacity to serve individuals from diverse cultural and socioeconomic backgrounds.

Project Challenge

STEM learning has been proven to uniquely position individuals to be competitive in an increasingly technological economy (Vossoughi and Vakil, 2018; Gutstein, 2007; Martin, 2003; Schoenfeld, 2004). Yet many children and families in Toledo do not have access to engaging STEM learning experiences. Schools struggle to present a wide range of STEM topics, especially in the early years, as very few elementary school teachers have college or graduate degrees in these disciplines and fewer than half feel well prepared to teach science (Banilower, E. R., et al., 2013). As a result, they are often uncomfortable teaching these topics and, as students are not tested until fifth grade in Ohio, classroom time addressing STEM content may be minimal. This is concerning, especially as research shows students who are interested in science by the eighth grade are three times more likely to study these subjects in college and pursue a STEM career (Choney, S., 2018).

Engagement with STEM subjects is important in non-college career pathways as well. In October of 2019, the Federal Reserve announced that Toledo holds the top spot among the 121 largest cities in the nation for "opportunity occupations." These positions, which do not require a four-year degree and pay over the national annual median wage, are often in the advanced manufacturing sector. Due to either the lack of an appropriately trained workforce or a lack of awareness, many of these positions go unfilled each year. (Wardrip and Nelson, 2019). As Toledo's average household income is $37,339 (significantly lower than the national average of $60,336), enhanced knowledge of STEM can have a substantial economic impact on Toledo and the surrounding region.

Imagination Station is a hands-on science center serving 200,000 individuals annually at its facility and out in the community. It is located in downtown Toledo, a mid-sized American city with a manufacturing economy. Its mission is to serve our community by providing informal science education and fun in order to spark a passion for the sciences by combining interactive exhibits and educational programming. A top-level goal in the science center's 2014 Strategic Plan is make science accessible to all members of our community. Pursuant to this goal, we began collecting visitor information and feedback to create baseline data against which we could measure future gains in July 2018. Exit surveys allow visitors selected at pre-determined intervals to provide demographic information, including race/ethnicity, household income and educational attainment. Findings suggest visitors to Imagination Station are less diverse, better educated and have higher incomes than the community at large. In Lucas County, the population of around 430,000 is 20.3% Black or African-American and 7.3% Hispanic. Science center visitation was determined to be only 5% Black or African-American and 4% Hispanic. Additionally, 25.6% of Lucas County residents have a bachelor's degree compared to 40% of science center visitors. Lastly, the median income is $44,820 in Lucas County, but only 20% of visitors indicated an annual income of $49,999 or less. Sixty-four percent indicated an annual household income of $50,000 or more (U.S. Census Bureau Statistics, See Supportingdoc7).

How was this challenge identified?

To achieve this goal, we must address physical, financial and sociological barriers to participation. A Strategic Plan-mandated review of existing efforts to expand access, including waiving admission for Lucas County children accompanied by an adult on Saturdays and raising funds to offer free or reduced admission for school groups, revealed that our efforts focus primarily on one barrier (economic). Yet evidence suggests removing just one barrier is not sufficient (Ipsos MORI, 2003). And efforts proven effective for dominant-culture populations—for example, offering programs at low or no cost, or issuing targeted invitations—are not always as comparably effective to

increase access for minority populations (Falk, Storksdieck and Dierking, 2007)). While recognition of inequalities to access exists (National Research Council, 2011), the field of science education has struggled to create robust, meaningful educational opportunities that engage nondominant students in complex learning and as empowered makers of meaning (Bang at al., 2012). A focus on tinkering has been chosen to promote a lifelong love of learning in STEM because research demonstrates both making and tinkering are powerful means for engaging and exciting children around STEM learning (New York Hall of Science, 2010; Resnick and Rosenbaum, 2013).

In 2016, Imagination Station added Idea Lab, an exhibition featuring experiential learning and a focus on innovation skills. The 2015 Idea Lab Philosophy Document explains, "Idea Lab is a space where individuals can come to create, dialogue and explore with materials and ideas. It is a safe space for visitors to express themselves through the process of creating and where every visitor brings and shares a part of themselves in the process." (See Supportingdoc5). The space promotes 21st-century skills and scientific inquiry, and contains a Tinkering Space that has seen as many as 2,000 visitors in a month. Evaluation data shows the learning outcomes we hoped for when the space was designed (See Supportingdoc6). Yet too many members of our community are unable to visit.

How are others addressing this challenge?

In June 2019, Imagination Station hosted structured conversations with civic and cultural organizations serving children and families in our community as well as those involved in workforce development (Adelante, Lucas County Children Services, Water for Ishmael, Northwest State Community College, Lucas County Jobs & Family Services and more) to discuss barriers that prevent children from engaging with STEM learning and to explore different strategies for increasing access to programming and experiences. Participants noted both structural (cost, transportation) and cultural (lack of relevance or personal identification with STEM) barriers. More broadly, researchers note the importance of recognizing that minority populations may view informal science education (ISE) institutions as 'not for us' when designing or implementing initiatives to increase inclusion. Many ISE practices are rooted in participant expectations around scientific knowledge and language skills found primarily in more socioeconomically advantaged households (Dawson, 2014).

We propose a focus on making and tinkering because of their power to engage and excite children around STEM learning (New York Hall of Science, 2010; Resnick and Rosenbaum, 2013); however, quality curriculum is not enough. Conversation participants were adamant we would need to take these experiences to participants from marginalized populations, as transportation often presents an insurmountable barrier. Carnegie Science Center, a project partner, is one of a number of museums that have incorporated mobile maker spaces into their outreach programs to address this challenge. Noted Shawna Woody, Director of Operations for the Boys & Girls Clubs of Toledo, "Our Clubs are all situated in underserved communities and, for a myriad of reasons, access to the amazing science center is a challenge. By bringing the program to the Clubs, this obstacle is eliminated."

Making and tinkering as a learning practice has profound educational value (Martin, 2015). There are many definitions of making in use. Some emphasize its hands-on nature (Honey and Kanter, 2013). Others focus on its use of digital tools and resources (Blikstein, 2013) or conceptualize it within a larger DIY (do-it-yourself) framework (Kuznetsov and Paulos, 2010). Research suggests that 'individual agency' in making can help promote student autonomy, critically important when these activities are framed in an equity context (Quinn and Bell, 2013).

Toledo Tinkers engages in inquiry best defined as 'making' as well as investigations that more closely resemble 'tinkering'. Learning outcomes for both are consistent: learner engagement, demonstration of initiative and understanding, social scaffolding and development of understanding (Bevan, B., et al., 2017; Supportingdoc5). When framed within the context of the dominant culture, the maker movement is largely an adult, white, middle-class endeavor. Not all families can afford the free time to tinker, have the technical knowledge and experience required or can allocate resources for the materials and tools needed (Barton, Tan and Greenberg, 2017). Yet many communities of color have long histories of making, born of both necessity and cultural expression (Vossoughi, Hooper and Escudé, 2016). This argues for the importance of framing a young maker as someone engaging in deliberate and purposeful work. (Barton, Tan and Greenburg, 2017). By challenging the normative understanding of making, we open up opportunities to reimagine '*who* we see as inventors, *what* we see as creativity, and *on whose terms* their ideas and practices are valued' (Vossoughi, Hooper and Escude, 2016). The San Francisco Boys & Girls Club Tinkering Program at the Exploratorum was designed for equity, and is a best-practices model for our project.

Our project includes conversations with community stakeholders to ensure our activities are culturally engaging and relevant to participants. During programming, participants will use the tools of critical ethnography to identify and link cultural and neighborhood traditions of making and tinkering to STEM activity. Making 4 Change, an after-school makerspace program in Michigan and North Carolina provides a valuable model for how youth can appropriate and repurpose the process of making (Barton, A.C., Tan, C., & Greenberg, D., 2017).

By rooting the practice of making and tinkering in the individual and social histories of the maker, value is placed on a learner's cultural and learned experience. Providing learners with tools to look at their communities as an ethnographer might has tremendous potential to develop and increase community pride and understanding, as well as individual agency and empowerment (Barton, Tan, Greenberg, 2017). It also provides the learner with the opportunity to see meaningful learning outside of the traditional confines of the classroom environment.

Who will benefit?

The main beneficiaries of our program will be children ages 11-13 and their families living in marginalized parts of our community. We chose this middle-school age because this is when students begin to consider career options. Most of our work will take place in after-school settings. However, if children are to realize the potential of STEM learning, all learning spaces must be welcoming, accessible and inclusive, allowing visitors to see their own faces and values represented. Too often this is not the case at ISE institutions (Bell, Lewenstein, Shouse & Feder, 2009; Department for Cultural Media and Sport, 2011; OECD, 2012). Thus, this project includes development of a community narrative exhibition showcasing the experience of making for the project participants and their final products. The exhibition will also help root the science center in the larger Toledo community.

Addressing the Goals of IMLS and the Museums for America Program

The Toledo Tinkers project aligns with **IMLS agency goals** of (1) Promoting Lifelong Learning (a) using inquiry-based learning methods and (b) focusing on continuous learning for families and individuals with diverse backgrounds and needs and (2) Increasing Public Access by forming partnerships to address access barriers to programs. It aligns with **Museums for America's Lifelong Learning Category,** as its activities are designed to encourage exploration, analysis and questioning for participants of differing backgrounds and its tinkering-based curriculum fosters discovery, critical thinking, creativity, collaboration and problem solving.

Project Work Plan

Our project aims to increase access to making and tinkering opportunities for marginalized communities in the Toledo area. Our four goals include:

1. Enhance access to STEM learning opportunities by determining and addressing cultural and socioeconomic barriers to informal learning in science education.
2. Develop and deliver a mobile tinkering lab and curricula to expand community access to transformative and innovative STEM learning opportunities.
3. Create a community narrative exhibition showcasing the diversity of our community and Toledo's rich history of making and tinkering
4. Develop a framework for implementation of a community-specific model of inclusive making and tinkering

Specific Activities

1. Deepen our Understanding of Community Need and Appropriately Situate Making/Tinkering: Our first step will be to hold conversations with stakeholders of our delivery partners (Boys and Girls Clubs of Toledo, Adelante and Water for Ishmael) Strategic conversations with the library and community stakeholders, data from science center zip code visitation and area school science test scores will help to determine 'STEM Deserts' within the Toledo community. These areas, similar to the more commonly known 'food deserts', represent areas where access to quality STEM education is limited (Change the Equation, 2019). After mapping these areas, we will target them for Tinkering Takeover delivery. Community conversations will be facilitated with the assistance of Dr. Karie Jo Peralta. Advisors Dr. Shirin Vossoughi and Meg Escudé will provide guidance on issues around tinkering and equity, and share their experience with the Exploratorium after-school model.

2. Design, Prototype and Pilot Culturally Relevant Making/Tinkering Curricula with partner cohorts (Maker Club): Research shows both making and tinkering offer a playful, collaborative and inquiry-based approach

to engaging youth in STEM-rich learning (Martin, 2015). Imagination Station has been steeped in this pedagogy since opening our tinkering space in May 2015. Maker Club, a 12-session program with identified partners, is an evolution of our existing practice and will look at how children can incorporate critical ethnography into the process of making. We will root the practice of making and tinkering in the individual and social histories of participating children, which places value on their past knowledge and lived experience. By providing learners with tools to look at their communities as an ethnographer might, there is tremendous potential for community pride and understanding, in addition to individual agency and empowerment (Barton, Tan, Greenberg, 2017). After looking at their own community's strengths, challenges and opportunities, children will identify a project that will support their community in some capacity. Children will document their experience and how they perceive their community and themselves through photography. Benchmark programs, like PhotoVoice (photovoice.org) demonstrate the value of photography as a tool for self-advocacy and will raise awareness of both community strengths and opportunities. The Boys and Girls Clubs will work with us in Year One with an initial cohort of 20 children ages 11 – 13 years of age. Over the duration of this project, we will work with five Boys and Girls Clubs of Toledo cohorts. Adelante will be introduced in Year Two and Water for Ishmael in Year Three. The expectation is each partner and cohort will be unique and we anticipate learning through our experience with each of them. At the conclusion of delivery, we will develop a guiding framework for future implementation of this program that we will disseminate to colleagues.

3. Design, Prototype and Test Single Day Tinkering Experiences to Support Family Learning (Tinkering Takeovers): We will modify our curriculum to develop a second program designed for on-site delivery at various community locations. The TLCPL will serve as a critical partner to offer space some of their 20 locations throughout our community to deliver a portion of our Tinkering Takeovers. In areas identified as 'STEM Deserts' that aren't easily accessible through a branch library, we will look for other sites to conduct delivery. Tinkering Takeovers will emphasize support for the whole family as we will encourage family engagement with the experiences. In addition, we'll work with our partner, Northwest State Community College, to develop and implement experiences for older children and adults to raise awareness and highlight opportunities to pursue a pathway to the 'opportunity occupations' mentioned previously.

4. Develop mobile lab infrastructure: We will source and equip a cargo van with the necessary equipment and supplies to take tinkering and making activities on the road, building our capacity for outreach (See Supportingdoc9). Our project partner, Fab Lab Carnegie Science Center, will assist in the development of the mobile lab and provide critical professional development to inform implementation (See Supportingdoc8).

5. **Evaluate best practices around inclusion and access for Imagination Station staff:** Working with the tinkering team, we will develop a professional development curriculum for Imagination Station staff that includes implicit bias and cultural sensitivity training in addition to instruction on critical ethnography. This four-session program will be offered for facilitators before the start of each Maker Club and will be open to all staff as it has relevance to delivery both in the science center and in the larger community.

5. Community Narrative Exhibition, Toledo Tinkers: Through a Child's Eyes: One tangible outcome of the project is the creation of a community narrative exhibition showcasing the diversity of our community and its rich history of making and tinkering. The exhibition will showcase images of our community as seen through the eyes (and lenses!) of the children participating in Maker Clubs or Tinkering Takeovers and tell the story of how their projects connect to the larger community, as well as showcase the products of their work. This final piece will be housed at the science center, so when visitors of diverse backgrounds enter our facility, they see representation.

Who will plan, implement & manage the project?

Key Personnel:

Sloan Eberly Mann, Director of Education at Imagination Station, will oversee the project as the Principal Investigator. She has worked in informal science education for the past 13 years and oversees all science center programming, development and delivery. She is Principal Investigator for *Prime Time: A Pre-School Network to Promote Early STEM Learning*, supported with an IMLS National Leadership Grant. She will serve as liaison to project partners, advisors and evaluators, as well as oversee the Program Coordinator and Program Manager. **Caitlyn Carter** will serve as Program Coordinator, leading program implementation, working with partners to develop, prototype and pilot activities and leading stakeholder conversations prior to program implementation with each partner. Caitlyn has two years of experience as Program Coordinator on the Prime Time Project, and has been with

the science center since 2015. **Jeff Stevenson** will serve as Program Manager, offering guidance on program development and implementation, ensuring adherence to program activities and budget and assisting with the development of the mobile tinkering lab and community narrative exhibition. Jeff is Imagination Station's Education Program and Project Officer and has been with the science center for eight years.

The Tinkering Team

The success of the project depends on relationships and community partnerships. Each of our partner organizations has appointed a representative to the project's Tinkering Team, and will meet quarterly throughout the project to advise, evaluate and reflect on program implementation. Tinkering Team meetings will provide an opportunity for all to share perspectives with each other and with us. Resumes are attached for all (Resumes.pdf).

(1) **Boys & Girls Clubs of Toledo: Shawna Woody**. Shawna brings 15 years experience with the Boys & Girls Clubs of Toledo to the project, and a deep knowledge of the population it serves. She currently serves as Director of Operations. (2) **Toledo-Lucas County Public Library: Rebecca Ransberger**. Ms Ransberger is the Studio Lab Supervisor for TLCPL, and brings five years of experience as a librarian to the project. She will help with identification of STEM deserts and site selection in those areas. (3) **Northwest State Community College: Brittany Galbraith.** Ms. Galbraith has a deep familiarity with the issues that confront nontraditional students, and with supporting them for success. Northwest State will provide career connections for Tinkering Takeover participants. (4) **University of Toledo, Dr. Karie Jo Peralta**, Assistant Professor of Sociology at the University of Toledo. Dr. Peralta will help facilitate our community conversations and advise us on incorporating ethnography into the curriculum to add personal relevance for the tinkering and making activities.

Project Advisors:

Dr. Shirin Vossoughi, Assistant Professor of Learning Science, School of Education & Social Policy, Northwestern University, will serve as a project advisor. She has written extensively on issues of equity in making. She is joined by **Meg Escudé**, who brings to the project seven years of experience directing two equity-focused after-school programs at the Exploratorium in San Francisco, including the San Francisco Boys & Girls Club Tinkering Program. Dr. Vossoughi and Ms. Escudé will conduct one site visit to review program implementation.

Liz Whitewolf is Director of Science and Education at Carnegie Science Center. Fab Lab Carnegie Science Center is a digital fabrication makerspace that incorporates two mobile units. Ms. Whitewolf will share best practices in mobile making delivery. All advisors will also participate in two Tinker Team meetings annually.

Amy McNulty, Senior Associate at Formative Evaluation Research Associates, Inc. (FERA), is our Project Evaluator. Ms. McNulty will assist in developing instruments to evaluate our progress towards stakeholder goals. FERA brings extensive experience in evaluating museum-based programs to this project, and previously worked with Imagination Station to develop evaluation instruments for our on-site tinkering space. FERA's approach is stakeholder-based, participatory and focused on learning and practical use.

Project Maturity Level

Our project is in the piloting phase, and we will test the curriculum we develop in three distinct communities represented by participants in Boys and Girls Clubs, Adelante, and Water For Ishmael, as well as parts of the community identified as STEM deserts.

Project Duration: September 1, 2020-August 31, 2023

Year 1: September 1, 2020-August 31, 2021: Project work will begin with a first meeting of the Tinker Team, where FERA will conduct a structured Evaluation Design workshop to identify partner goals for the program, develop guiding questions and establish interpretation guidelines to ensure stakeholders have an equal voice in the program.

Imagination Station team will visit science centers with established mobile making programs and research, evaluate and prototype potential tinkering activities. Guided by Tinkering Team members and our advisors, we will create a professional development program featuring sessions on implicit bias, cultural awareness, critical ethnography and other topics important to ensure the success of children and families participating in project activities and that on-site, the science center is truly welcoming all members of the community. Community conversations will occur with stakeholders for the Boys and Girls Club of Toledo and at select library branches.

Guidance from the Tinker Team and community conversations will help to inform the development of the Maker Club curriculum, in addition to the structure and activities at the Tinkering Takeovers. We will work with Dr. Peralta to incorporate critical ethnography into our tinkering curriculum and develop a plan for the community

narrative exhibition that will incorporate the photographic and physical artifacts of the program into a permanent display at the science center. Given social media's ability to document experience and serve as a modality for self expression, a social media platform will be developed and incorporated into the community narrative exhibition.

We will work with Fab Lab Carnegie Science Center to develop the mobile tinkering lab that will be used to bring equipment and supplies to Maker Club and Tinkering Takeover locations. While our experience with tinkering inside the science center gives us a strong sense of the tools and resources needed, Carnegie will offer valuable guidance on layout within the van, refinement of tools and other practical considerations (See Supportingdoc8). They will also connect us to a larger mobile making network to help address any concerns as they arise.

In May 2021, we will pilot the first of six Year One Tinkering Takeovers, working with the Toledo Lucas County Public Library (TLCPL) to choose branches in parts of the community identified as 'STEM deserts.' We will capture data on participant experience using post-program surveys. From June to August, we will pilot a 12-session Maker Club at a partner-selected Boys & Girls Club, as part of their summer programming. In advance of program delivery, we will train teen mentors from the Boys and Girls Club location. They will assist at Maker Club sessions, ensuring that program leaders demographically reflect program participants. Our evaluator will conduct interviews with a sample of participants and administer pre- and post-program surveys to document increased interest in STEM-related activities, increased sense of inclusion in STEM practice and increased awareness of STEM career opportunities. Community conversations held following delivery will allow stakeholders to reflect on the program.

In August, FERA will facilitate a Stakeholder Data Interpretation Workshop. This session will actively engage our stakeholders (partners, team, representative program participants) in the analysis of data summarized by FERA using a hands-on, active learning process designed to correspond to guiding evaluation questions developed during the first Tinker Team session. This workshop will lead to actionable recommendations to strengthen the work. This process will be repeated at the end of each project year (See Supportingdoc10).

Year 2: September 1, 2021-August 31, 2022: In September, we will meet with Boys and Girls Club stakeholders for a Year One reflection. In addition, we will share results at ASTC, the annual meeting of the Association for Science-Technology Centers. Quarterly meetings with the Tinker Team continue, with Advisors in attendance at the October and April meeting. We will hire an artist to begin implementation on the community narrative exhibition, and we will continue to share community stories of making and tinkering via social media.

Professional development sessions will be offered three times in our second year to prepare team for upcoming Maker Club sessions as well as address the risk that frequent turnover of part-time team at the science center poses to the program. An assessment tool to measure team gains will be established and implemented.

Program delivery expands in Year Two. We will hold 18 Tinkering Takeovers at local library branches and other community locations, and will be joined by Northwest State Community College at half of these events. We will deliver four 12-session Maker Clubs, three at Boys & Girls Clubs locations that will include a teen mentor training and a fourth with children served in an after-school program by Adelante, an organization serving Hispanic members of our community. We will hold preliminary and post-delivery community conversations with Adelante stakeholders and conduct another round of site visits to science centers providing best-practice models.

Year 3: September 1, 2022-August 31, 2023: Program delivery continues, with Maker Clubs held at a Boys & Girls Club and Adelante location. We will take the deep-dive tinkering program to the American School after-school program, run by Water for Ishmael, a community organization serving immigrant families and their children through programming in the Toledo area. Our work with children at the American School will be preceded and followed by a stakeholder conversation. We will deliver 18 Tinkering Takeovers at local libraries and other community locations.

We will share program preliminary results at ASTC and with the larger mobile making community, in addition to groups interested in equity in education. Construction of the community narrative exhibition is underway, and this exhibit, to open towards the end of year, will provide a lasting, tangible result of the project. Exit survey data, a brief visitor survey and a sample of brief visitor interviews will help determine the impact of the exhibit. McNulty will facilitate a final Data Interpretation Workshop with project stakeholders, and create a final project report. Project results will be shared at ASTC in the October following the end of the grant period.

Resources Needed to Carry Out the Project:

The total cost of the project is $539,929, of which $250,000 is requested from IMLS and $289,929 contributed as cost share. The cost share represents a percentage of staff time, indirect costs, fringe benefits, Tinkering Takeovers

and Maker Club supplies, 90 percent of the mobile van and equipment, and all costs associated with the Community Narrative exhibit. We will also rely on the expertise of our staff and the institutional knowledge gained over 10 years of informal science delivery and 3 years of tinkering/making. We will rely on the wisdom of our Tinkering Team, our Advisors, and our community partners, who will provide critical insights into the communities they serve.

Project Results

Performance Measurement

Project evaluation will be provided by Formative Evaluation Research Associates (FERA). FERA's approach is stakeholder-based, participatory and focused on learning and practical use. FERA will work closely with Imagination Station to evaluate our progress towards project goals as outlined above and in our logic model (see Supportingdoc2) using data collected via surveys, interviews and observations that indicate changes in attitudes, behaviors and knowledge. Tangible artifacts, including photos taken by participants and items created during Maker Club and Tinkering Takeovers, will also be collected.

Intended Results

Toledo Tinkers will reach 160 children ages 11-13 involved in the Maker Club and an additional 1,680 children and their families through our Tinkering Takeovers. This delivery will serve children in the greater Toledo area, with particular emphasis on marginalized communities.

Project Outcomes:

For children and families participating in Toledo Tinkers:

- Increased access to making/tinkering opportunities in their communities
- Increased exposure to high-quality STEM education
- Increased interest in STEM-related activities and increased sense of inclusion in STEM practice
- Greater awareness of STEM career opportunities
- Ability to identify the practice of making as an opportunity for creativity, self-expression and community transformation
- Increased awareness of Imagination Station as a resource

For visitors to Imagination Station:

- Greater awareness of the long history of making and tinkering in the Toledo community
- Increased opportunity to see diversity represented at the science center

For Imagination Station:

- Increased cultural sensitivity and understanding of implicit bias among team members.

These tangible project results will help Imagination Station to better serve its community:

- Community narrative exhibit highlighting the diverse history of making and tinkering
- Mobile tinkering lab with the ability to serve traditionally marginalized populations in our community and increase access to making and tinkering in the Toledo area
- Robust curriculum that considers the needs and motivations of diverse learners to create transformative and innovative STEM learning opportunities
- Framework for implementation of this model in other communities, recognizing that the needs of the communities are not uniform

Sustained Benefits of the Projects

Toledo Tinkers: Through a Child's Eyes furthers Imagination Station's work to ensure all members of our community have access to high-quality, engaging STEM experiences, and the opportunity to develop a lifelong love of these subjects. The project makes possible Strategic Plan initiatives pursuant to this goal, and strengthens our capacity to meet it through professional development for team, the development of an exhibition designed to showcase the diversity of people pursuing STEM tinkering and making activities in our community, and a mobile tinkering van and associated curriculum that can be used to reach marginalized parts of our community into the foreseeable future. The project will also strengthen our case for additional support from local funders, whose interests often lie with the underserved in our community.

IMLS Access Timeline												
Year 1 (2020-2021)	September	October	November	December	January	February	March	April	May	June	July	August
Hire Program Coordinator												
Establish Tinker Team												
Advisory participation with Tinker Team												
Tinker Team meetings												
Site visit to other mobile maker experiences												
Research potential tinkering activities												
Establish feasibility/material needs of tinkering activities												
Develop professional development series												
Professional development for team												
Community conversations with stakeholders												
Program dev't including incorporation of critical ethnography												
Develop community narrative exhibition concept												
Purchasing van and supplies												
Van fabrication												
Program prototyping												
Develop social media platform to share community stories												
Tinkering Takeover at community events (6/yr)												
Training session for Boys and Girls teen mentors												
Maker Club (12 sessions) with Boys and Girls Club												
Boys and Grils Club debrief and calibration												
Program Evaluation												
Year One Evaluation Report												
Attend ASTC meeting												

Year 2 (2021-2022)	September	October	November	December	January	February	March	April	May	June	July	August
Dissemination of Year One results												
Community conversations with Year Two partner, Adelante												
Advisory participation with Tinker Team												
Tinker team meeting												
Site visit to other mobile maker experiences												
Professional development for team												
Hire artist for community narrative exhibition												
Community stories shared through social media												
Tinkering Takeover at community events (18/yr)												
Boys and Girls Club Year One reflection												
Training session for Boys and Girls Club teen mentors												
Maker Club with Boys and Girls Club												
Maker Club with Adelante												
Adelante Year One reflection												
Program Evaluation												
Tinker Team Year Two reflection												
Year Two Evaluation Report												
Attend ASTC meeting												

Year 3 (2022-2023)	September	October	November	December	January	February	March	April	May	June	July	August
Dissemination of Year Two results												
Community conversations with Year Three partner, Water for Ishmael												
Advisory participation with Tinker Team												
Tinker Team meetings												
Professional development for team												
Community stories shared through social media												
Tinkering Takeover at community events (18/yr)												
Training session for Boys and Girls Club teen mentors												
Maker Club with each community partner (9 week)												
Water for Ishmael Year One reflection												
Program Evaluation												
Tinker Team Year Three reflection												
Final evaluation report completed												
Installation of community narrative exhibition												
Attend ASTC meeting												