Museums for America

Sample Application MA-10-19-0583-19
Project Category: Lifelong Learning

Palo Alto Junior Museum & Zoo

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

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.

Enduringly popular, dinosaurs provide an inviting entry-point to engaging young children—and adults—in science. For many children, the thrill of discovering dinosaurs, and the world they inhabited, is an early introduction to biology, paleontology, geology, and other branches of science. The Palo Alto Junior Museum & Zoo is requesting IMLS support for *California Dinosaur Garden*, a permanent exhibition project, which will promote science learning and an inclusive environment for children ages 3-11, including children with cognitive and physical disabilities, and their caregivers. This three-year project will leverage JMZ's expertise in providing families with engaging, age-appropriate STEM experiences and our deep institutional commitment to inclusion for people of all abilities.

Researchers have discovered that for children to develop a scientific understanding of complex topics, such as paleontology, geology, climate change, and evolution, they need a foundation to build upon as they learn about these seemingly counterintuitive concepts. Building a foundation begins with compelling storytelling. Utilizing creative, sensory-rich exhibit techniques, *California Dinosaur Garden* will tell stories to help children understand the diversity of prehistoric life that existed, that plants and animals evolved over time and some went extinct, and that scientists use fossil and geologic evidence to inform our scientific understanding.

This project also addresses the lack of quality science learning experiences for the growing number of children with a variety of disabilities. Although ADA requirements and best practices set accessibility standards, most museums minimally accommodate for people with disabilities. The JMZ's IMLS-funded project, *Access From the Ground Up*, and the 2010 report, *Inclusion, Disabilities and Informal Science Learning* by the Center for the Advancement of Informal Science Education, have greatly informed the development of *California Dinosaur Garden*. Although the report "located a number of projects, initiatives, and organizations that have sought greater inclusion of people with disabilities in [informal science education]. These efforts are still the exception and not the rule."

To address these needs, the *California Dinosaur Garden* project goals are to:

1.) Provide rich **science learning exhibits** for children and their caregivers about dinosaurs and life over time. By exploring fossils and prehistoric flora and fauna, children can understand changes over time, thus introducing more complex, yet age-appropriate, ideas about evolution and extinction.
2.) Champion **inclusion and deliver an accessible experience** for children with disabilities. By creating *California Dinosaur Garden* based on universal design principals that go well beyond ADA requirements, this truly inclusive project will benefit children with disabilities and all visitors to the JMZ.

The *California Dinosaur Garden* will create a "living diorama" interpreting the Cretaceous period in California at the JMZ's newly rebuilt facility. Located in a 4,160 square foot exterior courtyard, this engrossing experience built around an existing dawn redwood tree, will include prehistoric plants within a seasonal marsh landscape, ten interactive interpretive exhibits, a *Fossil Dig*, and four life-size dinosaur sculptures. Exhibit components will be fully inclusive, including wheelchair access to the garden experience, climbing dinosaur, and *Fossil Dig*. They will also include braille labels and tactile, sensory-rich elements.

The project activities to achieve the goals of the *California Dinosaur Garden* will include 1) the completion of initial concept design and front end evaluation to inform exhibit development; 2) design development, prototyping and formative evaluation; 3) design drawing and contracting with fabricators, installers and other needed contractors; and 4) fabrication and installation of exhibits and sculptures. We will also develop and launch a compelling marketing campaign in the Bay Area to secure attendance. After *California Dinosaur Garden* opens in March 2022, we will conduct multimodal summative evaluation and plan for any necessary remediation to exhibit components.

As a result of this project, children aged 3-11 years will have increased access to science learning experiences, thereby increasing their knowledge of dinosaurs and the evolution of life over time and creating a positive feeling and long-term capabilities for science learning. Families who have children with disabilities will feel welcome and included, and become regular visitors to the JMZ. As an experience built for accessibility, *California Dinosaur Garden* will be a role model for other institutions—exemplifying the inclusion of people with disabilities throughout the design process and the innovation that people who experience the world differently can bring to that process.

remarked, "I am particularly aware of the opportunity this [exhibition] represents given the surprising underrepresentation of paleontology among the public science exhibits available in the Bay Area." A survey conducted by the JMZ showed that 68% of adult visitors responded that they had "no knowledge" of California during the dinosaur age. In spite of this, they rated their child's interest in dinosaurs as "high." The *California Dinosaur Garden* will support parents as they facilitate their child's learning about these complex science concepts.

Inclusion

The JMZ is passionately committed to the inclusion of people of all abilities and ages, and the *California Dinosaur Garden* represents a continued focus area of this work. Nearly one in four Americans—including children—lives with some type of disability. Reflecting these national trends, in 2015-16, there were 125,486 students, K-12, enrolled in special education in the San Francisco Bay Area. While learning disabilities and speech or language impairments are the most common disabilities in special education, enrollment in special education for children with autism is a significant growth area. The 2016 National Survey of Children's Health, a government survey of parents, now estimates that 1 in 40 American children — or roughly 1.5 million — are on the autism spectrum.

The 2010 report, *Inclusion, Disabilities and Informal Science Learning* by the Center for the Advancement of Informal Science Education (CAISE), has greatly informed the development of our new exhibits. The CAISE report states that inclusion in informal science education (ISE) must go "further than ensuring that people with disabilities can enter the buildings or use the exhibits, programs, and technologies that deliver such experiences. It also requires that people with disabilities be able to learn from such experiences and participate as a part of, and not separate from, the larger social group and community." Although ADA requirements and best practices set accessibility standards, most museums minimally accommodate for people with disabilities. Indeed, the CAISE report "located a number of projects, initiatives, and organizations that have sought greater inclusion of people with disabilities in ISE. These efforts are still the exception and not the rule." The exclusion of people with disabilities in informal science learning results in the loss of future scientists and citizens that are scientifically literate and engaged.

The JMZ's current IMLS-funded project, *Access From the Ground Up* (see Supporting Document 3 for Abstract) directly addresses this lack of quality STEM education opportunities for the growing number of children with disabilities and will make the new JMZ facility and exhibitions accessible to everyone. The project is building lasting partnerships between the JMZ and organizations serving persons with disabilities. We have formed an ongoing Accessibility Advisory Team that meets quarterly to advise staff on exhibits, experiences, and social scape. Staff and volunteers are receiving intensive training and professional development opportunities to heighten their knowledge about contemporary access issues, and we are prototyping, testing, and building 27 new permanent exhibits, a respite space, and access resources for our reopening. Our popular bi-monthly Super Family Sunday events allow free and exclusive access to the JMZ for families who have children with disabilities and provide us opportunities for testing, feedback and connection. This project will greatly inform our work on *California Dinosaur Garden.*

Who or what will benefit from your project?

Specifically, this project will serve these two audiences:

1) Children (ages 3-11) and the caregivers
2) Families of children with cognitive and physical disabilities (often children have multiple challenges)

The general audience of the JMZ is ages 0-9 years for the visiting public and up to 5th grade for school field trips and programs. This exhibition will focus on children ages 3 and above. Fascination with dinosaurs often begins in preschool, and we will capitalize on that early interest. Elementary school-aged children are learning about paleontology in school, and this exhibition will support them. This project will provide an exciting learning experience for *all* children and their families in the San Francisco Bay Area. Creating an accessible experience for people with disabilities ultimately means the *California Dinosaur Garden* will be a better experience for all visitors. Specific accommodations focused on access for children with disabilities provide spillover benefits for visitors of all ages, including elders with physical or cognitive challenges.

1. Project Justification

What do you propose to do?

Enduringly popular, dinosaurs provide an inviting entry-point to engaging young children—and adults—in science. For many children, the thrill of discovering dinosaurs, and the world they inhabited, is an early introduction to biology, paleontology, geology, and other branches of science. The Palo Alto Junior Museum & Zoo is requesting IMLS support in the amount of $250,000 for *California Dinosaur Garden*, a permanent exhibition project, which will promote science learning and an inclusive experience for families with children with disabilities. This three-year project will leverage JMZ's longstanding expertise in providing families with engaging, age-appropriate STEM experiences and our deep institutional commitment to inclusion for people of all abilities.

The *California Dinosaur Garden* will create a "living diorama" interpreting the Cretaceous period in California. Located in a 4,160 square foot exterior courtyard, this engrossing experience, built around an existing dawn redwood tree, will feature prehistoric plants within a seasonal marsh landscape, interactive interpretive exhibits, including a *Fossil Dig*, and life-size dinosaur and prehistoric animal sculptures.

In 2017, the JMZ completed a $32 million capital campaign to support a complete rebuild of the obsolete Museum and Zoo on its existing site, almost doubling in size. Construction began in June 2018, and the grand opening of the new facility is planned for July 2020. Informed by strategic marketing experts advising on community engagement, JMZ is preparing for a highly anticipated opening. It is also planning innovative experiences to maintain visitation and enthusiasm after opening the new facility. By completing preliminary designs for *California Dinosaur Garden* before opening, the garden area will be ready to support this future accessible exhibition. It will then launch final exhibit design, testing and fabrication, and open this new experience in the second year of operation.

The *California Dinosaur Garden* project goals are to:

1.) Provide rich **science learning exhibits** for children and their caregivers about dinosaurs and life over time. By exploring fossils and prehistoric flora and fauna, children can understand changes over time, thus introducing more complex, yet age-appropriate, ideas about evolution and extinction.
2.) Champion **inclusion and deliver an accessible experience** for children with disabilities. By creating *California Dinosaur Garden* based on universal design principals that go well beyond ADA requirements, this truly inclusive project will benefit children with disabilities and all visitors to the JMZ. This goal is built upon JMZ's established inclusion efforts and the current IMLS-funded project, *Access From the Ground Up*, addressing the lack of quality STEM education opportunities for the growing number of children with disabilities and making the new facility and exhibitions currently under construction accessible to everyone.

An additional strategic benefit of this project is to support institutional sustainability by creating an exciting experience that maintains community engagement, attendance, and revenue after the new facility opens in 2020.

The project activities to achieve the goals of the *California Dinosaur Garden* will include 1) the completion of initial concept design and front end evaluation to inform exhibit development; 2) design development, prototyping and formative evaluation; 3) design drawing and contracting with fabricators, installers and other needed contractors; and 4) fabrication and installation of exhibits and sculptures. We will also develop and launch a compelling marketing campaign throughout the Bay Area to secure attendance. After *California Dinosaur Garden* opens in March 2022, we will conduct summative evaluation and plan for any necessary remediation to exhibit components.

The *California Dinosaur Garden* experience - A sensory-rich garden is an opportune area to provide a tactile, immersive exhibit experience for all learners, including those with disabilities. Fossils, dinosaurs, and prehistoric animals capture the imagination of children and adults, and provide perspective for the human place in the world. *California Dinosaur Garden* will interpret the Cretaceous period and provide visitors with a better understanding of the dinosaurs, flora, and fauna that once lived in California. The main message, which will be refined during front-end evaluation, is: *California was a different place when dinosaurs existed but some of the plants and animals, or ones similar to them, still exist today.* By focusing on California, we help children understand change over time by comparing their familiar environment to what it was like millions of years ago. Our existing mature tree—preserved during construction as a

major feature in the outdoor exhibition area—has a fascinating story for interpretation. During the age of the dinosaurs, the endangered, deciduous dawn redwood tree, *Metasequoia glyptostroboides*, was one of the most common trees in the northern hemisphere, including California. It was thought to be extinct until it was discovered in China in 1944. The exhibition will feature this "living fossil" along with other prehistoric plants and animals.

This outdoor learning experience is an ideal launching point to introduce children, and their adults, to paleontology and how scientists use evidence to inform our scientific body of knowledge. As stated by Richard K. Stucky, former curator at the Denver Museum of Nature and Science: Paleontology "inspires a wealth of curiosity by students about ancient life and helps all of us to know about our origins and how our world with humans came to be … But knowledge of the fossil record is misunderstood by many. In a recent analysis by the National Science Foundation, just over half of American adults sampled actually believed that dinosaurs and the earliest human beings lived during the same time." The *California Dinosaur Garden* enables us to connect geologic time in California with the timelines of our visitors, showcasing a very special tree specimen while addressing the need for paleontology education for young learners through universally designed exhibit experiences.

The other centerpiece of *California Dinosaur Garden* will be a climbing dinosaur sculpture of an *Aletopelta coombsi*, a type of ankylosaur that eats plants. It is an unusual dinosaur with a bulky body covered in bony armor with a club on its tail for defense. As herbivores, ankylosaurs likely grazed in lush areas near water. A marsh nearby will reflect the environment that existed in California millions of years ago. The seasonal marsh will be created by collecting and filtering storm water from the JMZ parking lot and will be landscaped with prehistoric plants that are still in existence today. Interpretive signage with illustrations and a tactile map of prehistoric California will help young visitors and their caregivers understand that most of California, including the Bay Area, was covered by ocean during the Cretaceous period. It is a predominant reason that there are not many dinosaur fossils in California—leaving gaps in our understanding of dinosaur-age land animals. Utilizing fossils and replica fossils, we will tell the story of how fossil evidence informs our understanding of the distant past.

Below the dawn redwood tree and amongst the plants, there will be two additional sculptures, an *Ichthyornis*, a toothed plunge-diving bird, and a *Pteranodon sternbergi*, a flying reptile with a 16' wingspan. These specimens were chosen because they were common animals in California during the Cretaceous period and represent a variety of species that may challenge visitors' preconceived notions of dinosaur-age animals. We intend to represent these animals in non-aggressive poses to counter the menacing stereotypes that exist of dinosaurs in popular culture and to avoid frightening young children.

An ADA compliant deck will provide access to the garden for all visitors. The deck will surround the dawn redwood, and the hands-on exhibits and signage will be located on it. The fenced landscaped area under the dawn redwood will contain one or more of the life-size sculptures among the plants and will not be accessible to the public. This will also be a protected location for our living tortoises and turtles—animals alive today that also roamed during the age of the dinosaurs. Visitors who are blind and visually impaired may enter this area and touch the tortoises and sculptures with staff facilitation. A wheelchair accessible ramp will provide access to the climbable *Aletopelta* dinosaur and *Fossil Dig*. Connected to a classroom, the deck will provide space for short programs—some specifically related to paleontology (see Supporting Document 1).

California Dinosaur Garden interpretive exhibits (10) will include touchable collections, such as real and replica fossils, petrified wood, rocks and living plants. There will be many other tactile elements. For example to interpret the dawn redwood tree, we intend to have a bas relief of the tree and a gathering of its real pine cones, needles, and small branches. To help visitors understand dinosaur sounds, we will have a sound exhibit that mimics the hollow, vertical crest on a duck-billed dinosaur's head, which is believed to have been a resonance chamber for vocalization. Tactile illustrations presented in a storybook format will depict the varieties of animals that existed—dinosaurs, marine reptiles, flying reptiles, and birds. We will also have tactile illustrations that depict unique Californian environments showcasing plant and animal diversity. These sensory-rich and touchable elements—essential for all

young children—will provide access for visitors who are blind or visually impaired, or who have disabilities that benefit from sensory interpretation.

The *Fossil Dig* exhibit will contain buried replica fossils of Californian marine reptiles, such as a large *Plesiosaur*. Since much of California was underwater during the age of dinosaurs, *Fossil Dig* will focus on this unique story. Children will be able to dig and discover the fossils using tools—a developmentally appropriate experience for young visitors due to its hands-on nature. A wheelchair accessible fossil dig table and a wheelchair transfer station into the *Fossil Dig* will provide two ways for people with limited mobility to experience the exhibit.

The *California Dinosaur Garden* will help children and their adults learn about prehistoric animals and plants, when they lived, and what the world was like then. Understanding the past is an important precursor to understanding complex topics that are so relevant today, like climate change, ecosystem change, and evolution.

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

Need for quality science learning opportunities for families

For children to develop a scientific understanding of complex topics, such as paleontology, geology, climate change, and evolution, they need a foundation to build upon as they learn about these seemingly counterintuitive concepts. Building a foundation begins with compelling storytelling. Utilizing creative exhibit techniques to tell stories can help children understand the diversity of prehistoric life that existed, that plants and animals evolved over time and some went extinct, and that scientists use fossil and geologic evidence to inform our scientific understanding. While this exhibition will not deeply focus on topics like evolution or climate change, it will set the stage for a child's understanding of life changing over time and will address the need for this kind of science learning.

"Despite being one of the foundational principles of biology, evolution is not widely accepted among the U.S. public (though the number is rising). High levels of misconceptions about basic evolutionary principles are found even among middle- and high-school teachers and college undergraduates," states Rob O'Malley, Senior Program Associate with American Association for the Advancement of Science's Dialog on Science, Ethics and Religion program. He goes on to write, "I believe that understanding the fundamentals of evolutionary theory can be critical for engaging with many pressing issues at the interface of the life sciences and society, ranging from conservation decisions, to human diversity, to epidemiology, and to other issues related to human health and well-being."

Psychologists and brain science researchers are uncovering new information on our ability to comprehend basic concepts of evolutionary biology and the importance of introducing young children to these concepts so they may develop a greater capacity for analytical thinking. In her article, "Starting Early: The Benefits of Teaching Counterintuitive Concepts in Childhood," Ashle Bailey-Gilreath, Research Assistant at the Institute of Cognitive and Evolutionary Anthropology at the University of Oxford, observes, "Previous research has shown that belief in evolution can be predicted by many demographic and cultural factors, such as religious ideology, political affiliation, and even what country you live in. However, research within the fields of psychology and the cognitive science of religion are beginning to uncover the cognitive mechanisms that underlie this phenomena. This new research also hints at some important strategies: we should begin teaching children how to grasp concepts like evolution while they are young, rather than waiting until they are teenagers." She goes on to state that young children are capable of understanding these concepts when compelling storytelling techniques are used.

In researching the knowledge of our local audience, we learned that many adults are still unclear on scientific principles of evolution. The 2014 Religious Landscape Study by the Pew Research Center discovered that 55% of adults in the San Francisco metro area believe humans evolved due to natural processes. However, the balance of 45% believe that humans evolved due to God's design (19%), or humans always existed in present form (19%), or they evolved, but don't know how (3%), or that they don't know (3%).

Additionally, there is a regional dearth of quality learning experiences in paleontology for children and their caregivers. One of the project's scientific advisors, C. Kevin Boyce, Professor of Paleontology at Stanford,

How will your project advance your institution's strategic plan?
The *California Dinosaur Garden* advances four goals of the JMZ Strategic Plan (2018-2022); to promote quality science learning opportunities for children; increase accessibility and inclusion for people with disabilities; strengthen existing, and advance new, community partnerships; and develop financial sustainability. The plan outlines actionable tactics, which will be advanced by this project (see Strategic Plan Summary for details).

How will your project address the goals of the Museums for America program and align with the project category you have chosen?
This project directly addresses the Museum For America program and Learning Experiences project goals. It strengthens the JMZ's institutional capacity to provide meaningful learning experiences for visitors of all abilities by 1) creating age-appropriate, multi-sensory, and inclusive *science learning exhibits* for children and their caregivers; 2) leveraging competencies in *inclusion* and delivering *accessible experiences* for children with disabilities.

The *California Dinosaur Garden* project will expand upon our project-based design of the innovative—and thus far highly successful—IMLS-supported *Access From the Ground Up* project. We will take learnings and competencies we have gained from preparing our new facility and apply this in-depth knowledge, experience, and our relationships to *California Dinosaur Garden* to increase our institutional impact. Formative and summative evaluation is a priority for IMLS and for the JMZ and will show demonstrable results of specific needs and project objectives.

2. Project Work Plan

What specific activities, including evaluation and performance measurements, will you carry out?
When and in what sequence will your activities occur?
The timeline for the *California Dinosaur Garden* project covers a 36-month period, from October 2019 to September 2022. To fulfill our goals, we will undertake the following activities:

- Completion of Initial Concept phase (Year One - Oct. 2019 to Sept. 2020) – This includes front end evaluation by consultant Adam Klinger; input from scientific advisors and our JMZ Accessibility Advisory Team, and completion of initial exhibit concepts and layout of the exhibits. In addition, the *Fossil Dig* boulders and area will be completed by the general contractor building the new facility.
- Design Development phase (Year Two – Oct. 2020 to March 2021) – Prototyping and formative evaluation of exhibits; refining exhibit layout based on the prototyping phase; definition of potential contractors, preliminary materials, and text and graphic styles.
- Design Drawing and Contracting phase (Year Two – April to Sept. 2021) – Graphic design and text writing, completion of fabrication drawings and scope of work, and consultation with structural engineers for sculptural requirements. Contracting with fabricators and beginning of marketing will also occur.
- Fabrication & Installation and Marketing phase (Year Three – Oct. 2021 to April 2022) – Sculptures are fabricated offsite and footings will be installed. Graphic production will take place, and exhibits will be installed. The marketing campaign will occur to generate excitement about the opening in March 2022.
- Summative Evaluation and Completion phase (Year Three – April to Sept. 2022) – This final phase includes summative evaluation by Adam Klinger, remediation planning, final reporting and project dissemination.

What is your project's maturity level (i.e. exploratory, piloting, scaling, or mainstreaming)?
While we will be *piloting* new access techniques in some of the *California Dinosaur Garden* exhibits, this project is positioning JMZ to enter the *scaling phase* of our work with the *Access from the Ground Up* project by deepening relationships with our inclusion partners, sharing techniques and lessons learned with colleagues in the cultural community, and continuing to integrate inclusion into staff practices on all levels of our work at JMZ.

What are the risks to the project and are they accounted for in the work plan?
Prototyping of exhibits is an activity associated with unknown outcomes, and this can be challenging. Formative evaluation informs the exhibit designs, therefore budgeting for exhibit features and inclusion components is difficult. However, these unknown design outcomes are what drive the kind of innovation we seek. Being a small and nimble staff, we are willing to try new approaches and respond to feedback from stakeholders. The reviewer who conducted the JMZ 2014 MAP Community Engagement Report wrote, "Embrace 'test and try' as an integral

part of the organizational culture. It was great to experience such open-minded thinking between the Friends Board, the City, and the staff. You have tested and tried so many things with limited resources, and it is very much what makes the museum special and flexible to adapt to change."

A secondary risk is that the initial concept phase occurs while the staff is completing building construction, building exhibits for the new JMZ, and preparing for the grand opening of the new facility in July 2020. This risk was accounted for by making the initial concept phase much longer than it would normally be.

Who will plan, implement, and manage your project?

Key JMZ staff who will be involved in this project include the following:

- Project Director: Tina Keegan, Exhibits Director, JMZ has been designing exhibits for 20 years at science and children's museums with previous experience designing and prototyping exhibits with people with disabilities. Since 2010 she has led the JMZ Accessibility Initiative. In 2015, she participated in the California Association for Museums' Accessibility Collaborative. As Project Director, she will provide direction and oversight. She will manage the exhibition development process, complete the design work on the project, and oversee contractors.
- John Aikin, Executive Director, JMZ, brings 38 years of experience in museums and zoos. His backgrounds are in biological science, exhibit design, and institutional management. At the San Francisco Zoo, he managed projects that cost from a few thousand to tens of millions of dollars. He has extensive experience in the administration of grants and will ensure that the project is completed on time and within budget.
- Alexandra Hamilton, Education Director, JMZ, has over 31 years of experience in education and museum programs. Committed to advancing JMZ's educational mission, she will participate in exhibition development.
- Accessibility Coordinator, TBD – This part-time position will manage the accessibility project activities by connecting the team to advisors and people with disabilities for feedback. The Coordinator will provide guidance and counsel on ADA and best practices for accessibility throughout the project.

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

This project funds an Accessibility Coordinator and accessible exhibits, including sculptures, braille, tactile elements, graphics, and translation and evaluation services. We need scientific expertise in paleontology, geology, and botany. The following scientific advisors have committed to serve on the project: Richard Hilton, author of Dinosaurs and Other Mesozoic Reptiles of California; Kevin C. Boyle, Stanford University Professor of Geology and a paleobotanist; Michael Hawkins, Program Director and Natalie Brubaker, Education Director at Canopy (nonprofit dedicated to trees). We need assistance in evaluation and will contract with an outside evaluator, Adam Klinger.

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

The Exhibits Director and Executive Director will oversee the project ensuring it achieves its goals. The Exhibits Director will track progress by managing the schedule and budget and by creating action items from formative evaluations, exhibit meetings, and prototyping sessions. Summative evaluation (detailed below and in Supporting Document 2) will measure if the project has achieved its goals and inform remediation to make improvements.

How and with whom will you share your project's results?

California Dinosaur Garden will be a model project for small- to mid-sized natural science and other cultural institutions. The outdoor "living diorama" environment with realistic sculptures and creative hands-on storytelling exhibits will offer a unique way for institutions to engage children in paleontology, and the universally designed experience will be an example of access and inclusion. The CAISE report (2010) outlines "the lack of systemic and accepted professional standards for approaching the inclusion of all individuals—especially those with disabilities—presents the greatest challenge for making inclusion a routine and commonplace practice in the field" of informal science education. Through this project work, JMZ staff will provide resources for other museum and zoo professionals by hosting networking events (such as the Bay Area Arts Access Collective), presenting at professional conferences (such as ASTC, ACM, AZA, and LEAD), posting the project on ExhibitFiles, and writing articles about the project. Evaluation results will be shared by posting it on the JMZ website and informalscience.org

3. Project Results

Referring to the Agency-Level Goal selected on the Program Information Sheet (i.e. **Promote Lifelong Learning**), review the Performance Measure Statements appropriate for your project and describe how you will collect and report the corresponding data.

While addressing all the Agency-Level Goals, the project most closely aligns with IMLS's Goal to **Promote Lifelong Learning** by providing families with an opportunity for science discovery and helping children to develop critical thinking skills. The relevant Performance Measure Statements for families, including those who have children with disabilities, include: *1) My understanding has increased as a result of this program/training; 2) My interest in this subject has increased as a result of this program/training* and *3) I am confident I can apply what I learned in this program/training.* These performance goals will be incorporated into the summative evaluation study by Adam Klinger, project evaluator. A multimodal research design will collect qualitative and quantitative data from various audience members. It will include visitor exit surveys, which will incorporate standardized IMLS performance measure statements in addition to internally generated questions (see Supporting Document 2 for details).

Referring to your Project Justification, describe your project's intended results that will address the need, problem, or challenge you have identified. These may be in addition to, but not instead of, the Performance Measure Statements specified in Appendix Three.

Through the *California Dinosaur Garden* project, the JMZ will provide rich **science learning exhibits** for children and their caregivers about prehistoric animals and the evolution of life over time and **deliver an accessible experience** for children with disabilities. Front-end evaluation will allow us to understand pre-existing knowledge, experience and interests in the California dinosaur age and evolution, as well as collect suggestions for improving accessibility. This visitor feedback will be used to help inform the final learning objectives and refine exhibition topics in order to provide rich learning opportunities and inclusion.

A main goal of the project summative evaluation is to assess the success of the exhibition in meeting both learning and accessibility goals. A multimodal approach will be used and will include visitor exit surveys and intercept interviews. Questions will prompt visitors to assess their perceptions of the exhibition and probe for understanding about the concepts presented. Summative evaluation findings will also inform exhibit remediation.

How will the knowledge, skills, behaviors, and/or attitudes of the intended audience change as a result of your project?

Children aged 3-11 years, including those with cognitive and physical disabilities, will have increased access to science learning experiences, thereby increasing their knowledge of dinosaurs and the evolution of life over time and creating a positive feeling and long-term capabilities for science learning. Families who have children with disabilities will feel welcome and included, and become regular visitors to the JMZ. By demonstrating inclusive practices throughout our facility, it is our hope that behaviors and attitudes of JMZ visitors towards people with disabilities will change with increased empathy and desire to support all children and families.

What tangible products will result from your project?

The following products will result from the *California Dinosaur Garden* project:

- The *California Dinosaur Garden* exhibition, including 10 hands-on interpretive exhibits, a *Fossil Dig*, a seasonal marsh landscape, a living tortoise exhibit, and 3 life-size prehistoric animal sculptures,
- Fully inclusive exhibits, including wheelchair access to the garden experience, climbing dinosaur, and *Fossil Dig*, a wheelchair transfer station for fossil dig, braille labels, and tactile, sensory-rich elements,
- Summative Evaluation Report will document findings, inform remediation and future strategies, and be disseminated to the informal science learning field.

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

The JMZ Strategic Plan directs the project's science education goals and that exhibits must be sustained and maintained over the long-term. The JMZ has an 83-year track record of sustained community service and consistent funding from the City of Palo Alto. The Accessibility Advisory Team will continue to advise the JMZ on future remediation and projects. Creating an inclusive experience for people with disabilities ultimately means JMZ will be a better experience for all visitors. As an experience built from the ground up for accessibility, *California Dinosaur Garden* will be a role model for other institutions—exemplifying the inclusion of people with disabilities throughout the design process and the innovation that people who experience the world differently can bring to that process.

Palo Alto Junior Museum & Zoo
Schedule of Completion