



## Museums for America

Sample Application MA-10-18-0283-18  
Project Category: Learning Experiences

### New Bedford Whaling Museum

Amount awarded by IMLS:	\$143,000
Amount of cost share:	\$147,668

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 FY2019 Museums for America grant program differ from those that guided the preparation of FY2018 applications. Be sure to use the instructions in the FY2019 Notice of Funding Opportunity for the grant program and project category to which you are applying.

New Bedford Whaling Museum: *Whales Today* Educational Programs  
IMLS: Museums for America Learning Experiences: Abstract

The New Bedford Whaling Museum (NBWM) respectfully requests \$144,000 over three years from IMLS to develop, implement, market, and evaluate a suite of educational programs and resources for a major new permanent exhibition titled *Whales Today*. *Whales Today* will serve as the Museum's introductory exhibition, orienting visitors to the status of whales today and mankind's historic and current interaction with these magnificent mammals. *Whales Today* will allow the NBWM to fully interpret its broad mission to tell the story of man's interaction with whales in the global ocean and ensure that the Museum remains a relevant cultural institution through its interpretation of critical modern topics including ocean health and marine mammal conservation.

This project will serve southeastern Massachusetts students and teachers in grades 2-12, with an emphasis on New Bedford Public School students in Grades 4 and 6 through a formal partnership between the NBWM and the public school system. This IMLS request focuses on two core components: 1.) Develop and pilot an intensive *Whales Today* curriculum for New Bedford Public School students in Grades 4 and 6, with corresponding professional development for teachers; 2.) Develop and implement new structured field trips, with corresponding docent training and web content, for students and teachers who visit the Whaling Museum to learn about *Whales Today*. Both components will reinforce Next Generation Science Standards and MA Science Curriculum Frameworks.

*Whales Today* addresses a significant need for life science education in the New Bedford Public Schools (NBPS). In 2016, New Bedford Grades 5 and 8 students who participated in Science and Technology MCAS (MA Comprehensive Assessment System) testing scored significantly lower than students in neighboring communities. Subsequently, the school district requested that the NBWM provide science content to students in Grades 4 and 6 that is aligned with Science Curriculum Frameworks and prepares them for standardized testing.

The NBWM will implement the project's activities between fall 2018 and 2021. The NBWM will begin by working with curriculum consultants to develop the curriculum for New Bedford Grades 4 and 6 and the field trips. The NBWM will then pilot the educational programs, conduct professional development for teachers and NBWM docents, develop online resources, create activity kits for teachers, and conduct preliminary evaluations on the pilot programs. In Year 3, the NBWM will fully implement the Grade 4 and 6 curriculums for New Bedford Public Schools and the field trips, as well as conduct final evaluations on all program offerings.

This project serves the New Bedford Public Schools and neighboring school districts by leveraging the Whaling Museum's content, educators, and educational materials to improve student understanding of marine science concepts. This project primarily benefits New Bedford students and teachers in Grades 4 and 6 (total of 2,268 students and 100 teachers), who will participate in a district-wide program designed to build science skills in advance of the Grade 5 and 8 MCAS tests. The project will also provide field trips to an average of 3,600 students in other school districts. Although students in neighboring school districts typically perform better on state tests, teachers routinely visit the Museum for science programs that will help their students improve MCAS scores.

The intended quantitative results of this project are: 1.) 85% of New Bedford 4th and 6th grade classes will participate in the *Whales Today* curriculum; 2.) 75% of New Bedford Grade 4 and 6 teachers attend professional development workshops for the *Whales Today* curriculum and rate it highly; 3.) 75% of 4th and 6th grade students who score markedly better on post-curriculum assessments than on pre-tests; 4.) 75% of teachers surveyed report that the *Whales Today* fieldtrips are "highly effective" in delivering content that meets Science Frameworks. 5.) 75% of teachers report that their students are "highly engaged" in the *Whales Today* field trips. Success will be measured through preliminary and final formal evaluations of the curriculum and field trips, as well as teacher and student assessments and qualitative feedback.

## 1. Project Justification

**What do you propose to do?** The New Bedford Whaling Museum (NBWM) respectfully requests \$144,000 over three years from IMLS to develop, implement, market, and evaluate a suite of educational programs and resources for a major new permanent exhibition titled *Whales Today*. This project will serve southeastern Massachusetts students and teachers in grades 2-12, with an emphasis on New Bedford Public School students in grades four and six through a formal partnership between the NBWM and the public school system.

Founded in 1903, the Whaling Museum tells the story of man's interaction with whales in the global ocean. *Whales Today* will serve as the Museum's introductory exhibition, orienting visitors to the status of whales today and mankind's historic and current interaction with these magnificent mammals. From this point of view, and only after this introduction, visitors will explore the broader history of human cultural and commercial connections with whales and whaling. *Whales Today* is driven by three primary themes: whale ecology, ocean health, and marine mammal conservation. These themes incorporate the following STEM (Science, Technology, Engineering, and Math) content areas: cetacean biology, habitat, feeding habits, communication and social behavior; comparative anatomy; conservation efforts; cetacean research; ocean stewardship; and current threats to marine mammals.

*Whales Today* will build upon the NBWM's work over the past two decades to expand beyond its roots in local and whaling history to become a leader in cetacean conservation education, drawing together history and modern science in order to present a fuller picture of man's relationship to whales. The central focus of the exhibition is the NBWM's five fully-articulated skeletons of a sperm whale, blue whale, humpback whale, and North Atlantic right whale and her fetus. Additional exhibition elements include a life-sized, crawl-through model of a blue whale heart, life-sized cutaway model of a baleen whale head that clearly shows the structure of the complex filtration system of these animals, as well as comparative displays of brains, hearts, and forward appendages, which will bring visual clarity to the differences and similarities among a variety of mammals. These new biological objects will be complemented by a wide assortment of bones, teeth, baleen, oil samples, and other natural resource artifacts that can be seen and handled by visitors. *Whales Today* will fully integrate these resources into the Museum's narrative for the first time.

The NBWM is developing the exhibition in partnership with Woods Hole Oceanographic Institution (WHOI) and the U.S. Navy, which have both provided loans of equipment and artifacts used by marine mammal scientists to capture sounds and data to better understand whales and the challenges they face in today's oceans. The exhibition is particularly relevant today, as critical cetacean conservation issues have recently come to the forefront in Massachusetts and other coastal communities. After years of population gains, the highly endangered North Atlantic right whale suffered a deadly summer of ship strikes and entanglements, resulting in a population decline for the first time in several years. There is now a greater sense of urgency in the scientific and advocacy communities to increase awareness of these issues among a wider audience.

Museum educators have been involved in each step of *Whales Today*'s development, crafting the exhibition's educational goals in partnership with Museum curators and content experts. The primary educational goals for students are for them to understand: whale ecology and the ways that the ocean environment affects how whales live; the interconnectedness of the marine environment and the species living there; and the role humans play in determining the health of the oceans. During the grant period, the Museum will develop a formal suite of educational programs to reinforce the exhibition's content for students in Grades 2-12, building on decades of experience delivering science programs to local students. In 2017, the NBWM signed a Memorandum of Understanding with the New Bedford Public Schools to serve as a marine science education content provider for the district with the goal of developing inquiry-based, cross curricular programs that directly address curriculum frameworks and corresponding standardized testing. This IMLS request focuses on two core components: 1.) Develop and pilot an intensive *Whales Today* curriculum for New Bedford Public School students in Grades 4 and 6, with corresponding professional development for teachers; 2.) Develop and

implement new structured field trips, with corresponding docent training and web content, for students and teachers who visit the Whaling Museum to learn about *Whales Today*. Both components will reinforce Next Generation Science Standards and MA Science Curriculum Frameworks.

The *Whales Today* Grade 4 curriculum will draw from the rich, place-based resources of nearby Buzzards Bay and the Atlantic Ocean to focus on cetacean anatomy and adaptations, as well as the interconnectedness of marine animals in their natural environments. This eight lesson unit will include an introductory visit by a Museum educator to each 4th grade New Bedford classroom (42 in total with an average of 1,200 students each year), six lessons taught in schools by teachers, and a visit to the Whaling Museum to tour *Whales Today*, followed by the completion of a capstone project. The *Whales Today* curriculum will make strong connections to three Grade 4 life science standards that address structures and processes, survival, growth and behavior, and sense receptors, as well as a physical science standard addressing energy transfer. Through experimentation and observation, students will discover the attributes of the ocean and the physical characteristics of whales that enable them to live in a marine environment. Students will compare and contrast characteristics of whales versus fish, understand the scale of a whale's size by making a model, evaluate subjective and objective data to determine the effect blubber has on temperature regulation, and compare and contrast the process of feeding for toothed and baleen whales. This curriculum will be piloted in every New Bedford 4th grade class for the 2017-2018 school year and fully implemented and evaluated 2018-2021 in tandem with the exhibition.

The *Whales Today* Grade 6 curriculum will study sound waves as a form of energy through the lens of the *William A. Watkins Collection of Marine Mammal Sound Recordings and Data*, a collection of 20,000 unique sound files of the earliest recorded marine mammals "calls" catalogued from the 1940s through the 1990s. The NBWM acquired the *Watkins Collection* from WHOI in 2015, and it is an important primary resource for *Whales Today*. This four lesson unit includes an introductory lesson taught by a Museum educator to each of the city's sixth graders in its three middle schools (average of 1,000 students), two lessons taught in schools by classroom teachers, and a visit to the *Whales Today* exhibition. This curriculum will reinforce two physical science standards that focus on wave properties including amplitude, frequency, length, energy, reflection, absorption, and transmission. Students will examine how sound waves can travel through different media as well as how sound waves travel in a given direction until an outside force gets in the way. Using actual whale "calls", students will compare communication patterns amongst species and explore how whales use sound energy to communicate, find food, and navigate in the ocean. This curriculum will be developed, piloted, and implemented during the grant period.

The NBWM will design *Whales Today* field trips for all school groups visiting the Museum for science programs, an average of 3,600 students per year. These 90 minute field trips will be led by Museum educators and highly trained docents. During the field trip, students will rotate through eight stations within the exhibition with content tailored to the Massachusetts Science Curriculum Frameworks prescribed for their grade levels (Grades K-2, 3-5, 6-8, and high school). Three of the stations will also include activity carts with hands-on activities that promote engagement, inquiry, and understanding. **Station 1: Comparative Anatomy** – A life-sized model of a blue whale heart and life-sized model of a human heart will serve as the basis for comparing structures in these two very differently sized mammals; **Station 2: Whale Feeding** - Using a full-sized baleen model, students will visually understand how four of the NBWM's five whale skeleton species collect and filter millions of tiny organisms; **Station 3: Cetacean Communication** – Students will listen to several audio files in the extensive *Watkins Collection* to understand how whales communicate; **Station 4: An Essential Adaptation** – The insulating properties of solid blubber will be clearly demonstrated utilizing a "blubber glove"; **Station 5: Whale Senses** - Students will experience the challenges of whale peripheral vision to understand how they navigate; **Station 6: Cetacean Anatomy** - Students will compare and contrast the anatomy of whales, dolphins, and porpoises, collectively known as cetaceans, to gain an understanding of this family of 89 species; **Station 7: Ocean Health - Exploration of the Marine Environment:** Students will learn about the dangers marine mammals face from ocean noise, ship strikes, entanglements, and marine debris. **Station 8: Stewards of the**

**Sea** - Students will use their understanding of the concepts covered during the tour to think critically about ways to help protect the marine environment. The scope of work and cost for developing these stations is funded separately as part of the exhibition's budget.

The content delivered at each station will be tailored for different grade levels and curriculum frameworks. For Grades 2-3, the learning will focus on structures and growth, energy and temperature, basics of sound waves, the ways in which surrounding provide for survival and reducing human use of natural resources. For Grades 4-5, students will learn about internal and external structures and processes, movement of matter through organisms and ecosystems, phase change, non-renewable energy and research technology. Grades 6-8 will focus on body systems, especially circulatory, cetacean evolution, amplitude, length and frequency of waves, relationships among and between organisms in an ecosystem, matter and energy transfer and ecosystem disruption. Students in high school will learn about body systems, transfer of chemical energy between trophic levels and the inefficiency of this process, cetacean evolution, and ocean acidification. They will be asked to consider climate change and shifts in food sources, and engineering solutions to entanglement.

**Need, problem, or challenge:** The *Whales Today* educational programs fill a long-standing hole in the Museum's core narrative. The NBWM cannot fully address man's relationship with whales without better explaining what whales are, how they live, and the challenges they face. Furthermore, the NBWM has long confronted an identity issue that pits the historical realities of killing whales against contemporary conservation measures and 21st century values. Strategically utilizing the Museum's unique collection of primary data resources, biological specimens, art, and historical artifacts, the exhibition will educate visitors on how our perception of whales has changed over time from commodity to icon of global environmental fragility, as a direct result of better scientific understanding and data. In this way, *Whales Today* will allow the NBWM to fully interpret its broad mission and ensure that the Museum remains a relevant cultural institution through its interpretation of critical modern topics.

Through *Whales Today*, the NBWM will lend its voice to a national conversation about marine mammal conservation. A 2009 comprehensive survey, sponsored by The Ocean Project, underscores the importance of museums tackling environmental and conservation issues. The Ocean Project surveyed 22,000 Americans and found that, "the public expects and trusts aquariums, zoos, and museums to educate regarding environmental and conservation issues and to provide guidance about how to address them personally and societally." These findings elevate the ethical and moral role and responsibility of museums to be accurate, educational, and trustworthy, particularly on topics of national importance like ocean health and marine mammal conservation.

*Whales Today* also addresses a significant need for life science education in the New Bedford Public Schools (NBPS). According to a recent review of the district, conducted by the Massachusetts Department of Elementary & Secondary Education, it is lagging behind other communities in science education and assessment. In all grade levels, the review found that curriculum maps for science curricula contain minimal details and include only generic assessment techniques and teacher resources. Currently, New Bedford 5th and 8th graders participate in Science and Technology MCAS (MA Comprehensive Assessment System) testing. Not surprisingly, in 2016, New Bedford 5th graders scored significantly lower on Science and Technology standardized tests compared to Massachusetts state averages. Only 22% of New Bedford 5th graders scored Proficient or Higher compared to 47% statewide. An alarming 51% of the city's 5th graders scored Needs Improvement compared to 38% statewide. Similarly, New Bedford 8th graders performed significantly lower than MA state averages, with 42% scoring Warning/Failing compared to 19% statewide.

**Who or what will benefit from your project?** This project serves the New Bedford Public Schools and neighboring school districts by leveraging the Whaling Museum's content, educators, and educational materials to improve student understanding of marine science concepts. This project primarily benefits New Bedford students and teachers in Grades 4 and 6 (total of 2,268 students and 100 teachers), who will participate in a

district-wide program designed to build science skills in advance of the 5th and 8th grade state science tests. The project will also provide field trips to an average of 3,500 students in other school districts. Although students in neighboring school districts typically perform better on state tests, teachers routinely visit the Museum for science programs that will help their students improve MCAS scores.

**How will your project advance your institution's strategic plan?** The NBWM's broad education goal, as articulated in the 2014-2019 strategic plan is to provide a meaningful experience for students, educators, scholars, and enthusiasts designed to foster a community of lifelong learning through both formal and informal education programs. This project advances three of the specific objectives articulated in that plan: that the NBWM will maintain a leadership role in providing structured experiences for students K-12, pivot its educational approach to use its unique content to develop basic skills, and partner with schools and colleges to foster and deepen educational opportunities.

**Goals of the Museums for America program and alignment with the Learning Experiences project category:** This request provides essential support to the Museum's ability to serve two key demographics, teachers and students, which are central to the Museum's educational mission. As an established provider of educational content, the Museum differentiates itself by uniquely combining history, science, and art through a thematic exploration of man and whales. It aligns with the Learning Experiences project category by providing professional development for educators in school and in out-of-school settings. Primarily, this project is a learning partnership with schools, and it supports the development of museum resources and programs in support of MA Science Curriculum Frameworks.

## 2. Project Work Plan

**Activity #1: Develop content for curriculum and field trips:** Museum staff will hire curriculum consultant Ania Driscoll-Lind to develop Grade 6 curriculum. Ms. Driscoll-Lind consulted with Lawrence Hall of Science to develop *Waves, Energy and Information*, an investigation of how dolphins communicate. Ms. Driscoll-Lind will use this experience to integrate the Museum's collection of bioacoustics sounds into the Grade 6 curriculum. Prior to the grant period, the NBWM hired curriculum consultant Karen Manning to design the Grade 4 pilot curriculum. The NBWM was impressed with her collaborative writing style and ability to incorporate feedback from teachers, administrators, and Museum educators. The NBWM will work with Ms. Manning during the grant period for the full implementation of the Grade 4 program, as well as for field trip development for grades 2-3, 4-5, 6-8, and high school. **Performance Measurements:** Educational program curriculum and field trips designed and ready for implementation.

**Activity #2: Design kits for teachers to use in classrooms:** The NBWM will design resource kits for New Bedford teachers in Grades 4 and 6 containing necessary materials to teach the curriculum including: lesson plans, materials and instructions for related experiments, student worksheets, and related books and reading materials. **Performance Measurements:** Teachers report that kits effectively help deliver in-class lessons.

**Activity #3: Design activity cart for field trip tours:** Working with Ms. Manning, Museum educators will design and build three activity carts to accompany the new *Whales Today* school field trips. These carts will be adaptable for various grade levels and address basic whale anatomy structures, classification of marine species, energy flow through trophic levels, and mammal comparative anatomy. Students will work collaboratively to match, sort, and think critically about the interconnectedness of the marine environment. **Performance Measurements:** Docents will report the carts help students engage with the content.

**Activity #4: Conduct professional development for teachers:** In August of each year of the grant period, the Museum will conduct paid professional development workshops for Grade 4 and 6 teachers, who have not previously attended a workshop, to familiarize them with the scope and sequence of each curricular unit. Teachers will tour the *Whales Today* exhibit, work with the teacher resource kit, and conduct each of the

experiments, gaining first-hand experience before instructing students. **Performance Measurements:** 80% of teachers feel “very confident” and 100% of teachers feel “confident” to teach the curriculum.

**Activity #5: Conduct professional development for volunteers:** The Museum field trips are supported by more than 80 docents. Prior to the opening of the *Whales Today* exhibition, NBWM educators will hold workshops for docents to learn the new field trips and provide them with program notes. The Director of Education and Science Programs will also offer ongoing training on an informal basis. The evaluator will coach docent volunteers to improve overall tour quality. **Performance Measurements:** 80% of volunteers feel “very confident” and 100% of volunteers feel “confident” to conduct educational tours.

**Activity #6: Pilot Grade 6 curriculum:** The Museum will work with the New Bedford Public School to determine one middle school (out of three) to participate in the Grade 6 pilot program. Museum educators will meet with teachers in the selected school before and after the unit to discuss program elements. Recommendations from teachers and the evaluator during the pilot program will be incorporated into the next year’s curriculum. **Performance Measurements:** 80% of teachers find the *Whales Today* curriculum “highly effective.” 100% of teachers find the *Whales Today* curriculum “effective.”

**Activity #7: Teacher Focus Group to review field trips:** Museum staff will invite four teachers to participate in a paid focus group to evaluate the *Whales Today* field trips and offer feedback to be incorporated into the final version of the program. The focus group and evaluator will work with Museum staff to determine the effectiveness of the activity station components through interviews, post-tour assessments, and participant feedback. **Performance Measurements:** Focus group will approve of the final design of the activity stations.

**Activity #8: Development of online resources:** The Museum will develop online resources for teachers and students to enhance their learning, which will be accessible through the *Whales Today* section of the Museum’s website. These resources will include the full curriculum, lessons plans, supporting activities and experiments, pre- and post-visit materials, and other Museum marine science program materials. They will be highly visual and include in-depth content about the four whale species that anchor the exhibition. The *Watkins Collection* will feature prominently on the website with an interactive component allowing students to identify different whale calls, name clicks, whistles and tones, and determine the source of different underwater sounds. The website will also contain resources for students to advocate for marine mammals and ocean health. **Performance Measurements:** Visitors to the “Learn” tab on the NBWM site will increase by 10% from 122,415 hits in 2016, to 134,657 by 2021.

**Activity #9: Implement curriculum district wide:** Once the pilot curriculums have been successfully executed, evaluated, and approved, the curriculum will be adopted district wide. Museum staff will meet with teachers at each school to describe the program, outline the professional development, and discuss the timeline of activities. Evaluator will prepare final report. **Performance Measurements:** Museum educators will visit all schools participating in the project.

**Activity # 10 Implement *Whales Today* field trips:** Once the pilot field trips have been successfully executed, evaluated, and approved, the field trips will be adopted. Evaluator will prepare final report. **Performance Measurements:** Museum educators will offer *Whales Today* field trips.

**Activity #11: Marketing and Promotion:** Museum staff will design printed materials to promote the *Whales Today* field trips. The materials will include a program brochure containing the new field trips as well as other structured school group field trips. The Museum will also develop a poster depicting *Whales Today*’s four whale species in their natural habitat with vital information about each one. This will be available to students as a post-visit resource and will also serve as a marketing/branding tool. **Performance Measurements:** Field trip attendance will increase by 10% from 14,895 in 2016 to 16,385 by 2021.

**What are the risks to the project and are they accounted for in the work plan:** This project involves close cooperation with the New Bedford Public Schools (NBPS) and there is inherent risk that staff turnover and lack of institutional memory could threaten the sustainability of the partnership. To mitigate that risk, the NBWM signed a Memorandum of Understanding (MOU) with the NBPS in 2017 to provide science programming for Grade 4. The MOU is positioned to be renewed yearly and the NBWM anticipates that it will endure beyond the inevitable administrative turnover. Another risk to the project is teacher resistance to incorporating new lessons into their curriculum. The NBWM plans to mitigate this risk through the summer professional development workshops with teachers. Feedback from the summer 2016 Professional Development workshop for the Grade 4 pilot program was highly positive, with several teachers saying it was the best professional development workshop they had ever attended. An additional risk to the project is the growing expense of field trips for local districts. The NBWM is committed to applying for grants to subsidize admission and transportation costs for local students; in 2017 the Museum covered these costs for 5,855 students and teachers.

**Who will plan, implement, and manage your project?** Vice-President of Education and Programs Sarah Rose will manage the project. Ms. Rose has a BA in Economics from Wheaton College, an MBA from NYU, and an MAT from Simmons College. Director of Education and Science Programs Robert Rocha will implement the project, conducting both the museum and in-school science programming, and teacher training. Mr. Rocha has a BS in Biology from University of Massachusetts - Dartmouth and an MS in Environmental Studies from Antioch University New England. He has more than 20 years of experience creating and implementing educational programming in informal settings. Michael Lapides, Director of Digital Initiatives, will manage the development of web content. Mr. Lapides holds a BA in Fine Arts from Brown University.

**When and in what sequence will your activities occur?** In Fall of 2018, NBWM will adapt the Grade 4 curriculum for implementation and develop the Grade 6 curriculum. Curriculum resource kits will be completed by June 2019. In August 2019, New Bedford Grade 4 and 6 teachers will be invited to a paid, one day professional development workshop prior to the Grade 6 pilot year and Grade 4 implementation. Starting in October 2019, the curriculum, experiments, and supplemental materials will be available online. For the 2020 - 2021 school year, the Grade 6 program will be expanded city wide, the Grade 4 curriculum will be fully implemented. The August training sessions will be ongoing for new teachers. An evaluator will write an interim report in January 2020 and a final report in September 2021. NBWM staff will introduce new field trip tours from October 2018 through April 2021 (Grade 2-3 in October 2018, Grade 4-5 in April 2019, Grade 6-8 in April 2020, and high school in April 2021). Four teachers will be invited to evaluate each field trip and Museum docent volunteers will be trained to deliver each new field trip as they are rolled out. Printed materials for school field trips including education brochure, poster, and teacher resources will be produced to correspond with each new field trip. An evaluator will work with NBWM as each field trip is introduced. Website redesign and adding content will begin in January 2020 and continue until September 2021.

**Time, financial, personnel, and other resources:** The Director of Education and Science Programs will devote 50% of his time to executing this project. Four NBWM staff members will contribute to the project developing curriculum, working with teachers, and building out the website. The Museum will use the expertise of two curriculum consultants to develop the curriculum. An evaluator will work with Museum staff to ensure proper implementation of all activities. NBWM enjoys a strong partnership with New Bedford Public Schools and will continue to foster the relationship to enhance science programming in schools and at the Museum.

**How will you track your progress toward achieving your intended results?** The NBWM is committed to formal and informal evaluations of the *Whales Today* educational programs. The NBWM will hire an evaluator to review the curriculum and field trips during their pilot stages and make recommendations for implementing each program. Program staff will also introduce internal measurements to track progress towards intended results, including quantitative data and qualitative feedback from teachers. The *Whales Today* Grade 4 and 6 curriculums will contain pre- and post-assessments for each lesson and capstone projects with accompanying



rubrics developed by the Museum. Teachers participating in the *Whales Today* structured educational programs will be asked to evaluate the quality of the curriculum and/or the field trip. The *Whales Today* online resources will also be monitored to evaluate the number of visits to the Museum's website. The informal evaluations at the end of each lesson will include questions to provide feedback on the website from participating teachers.

### 3. Project Results

**Performance Measure Statement(s):** The project's primary objective is to strengthen the Museum's position as an essential partner in addressing the needs of the NBPS and other school districts interested in the *Whales Today* exhibition. Through this project, the NBWM will support communities of practice by conducting and evaluating professional development for teachers and Museum docents to empower them to incorporate the *Whales Today* lessons in their classrooms and educational tours. Through pre- and post-professional development participant surveys, the NBWM will collect data on two Performance Measure Statements, that of "my understanding has increased as a result of this training" and "I am confident I can apply what I learned in this training." This project will also provide inclusive and accessible learning opportunities for students focusing on the performance measure, "my understanding has increased as a result of this program." Data will be collected through pre- and post-evaluations for students as well as through teacher evaluations.

**Intended results:** This project will address the documented need for science education in Southeastern Massachusetts elementary and middle schools to increase student achievement within the 2016 MA Science and Technology/Engineering Curriculum Frameworks. The intended quantitative results of this project are: 1.) 85% of New Bedford 4th and 6th grade classes will participate in the *Whales Today* curriculum; 2.) 75% of New Bedford Grade 4 and 6 teachers attend professional development workshops for the *Whales Today* curriculum and rate it highly; 3.) 75% of 4th and 6th grade students who score markedly better on post-curriculum assessments than on pre-tests; 4.) 75% of teachers surveyed report that the *Whales Today* fieldtrips are "highly effective" in delivering content that meets Science Frameworks. 5.) 75% of teachers report that their students are "highly engaged" in the *Whales Today* field trips.

**Knowledge, skills, behaviors, and/or attitudes that will change:** Through this project, students will better understand whale ecology and the ways that the ocean environment affects how whales live; the interconnectedness of the marine environment and the species living there; and the role humans play in determining the health of the oceans. Teachers and volunteers will be better prepared to teach these concepts through comprehensive training programs. Schools throughout Southeastern Massachusetts will use the *Whales Today* field trips to enhance their marine science teaching. Students' increased awareness and understanding of the ocean will improve their attitudes and behaviors towards protecting the marine environment.

**What tangible products will result from your project?** This project will produce the following products: Grades 4 and 6 curriculum guides; activity kit containing items needed for experimentation and practice as well as consumable printed materials; three activity carts with exhibition related objects; a *Whales Today* section of the Museum website containing information, activities, and resources; printed materials including a school programs brochure, whale take-home poster, and teacher resource guide.

**How will you sustain the benefit(s) of your project?** The NBWM's science programs were first developed over a decade ago and are a core component of the Museum's educational offerings. Teacher demand for science programming has remained consistent over the years with an average of 3,600 students receiving science education at the Museum each year. Once developed, piloted, and implemented, the *Whales Today* curriculum and field trips will become part of the Museum's permanent educational offerings. When the grant period ends, the NBWM will have demonstrated its value to the NBPS and plans to be written into the departmental budget on a yearly basis to provide science programming for Grades 4 and 6. Endowed funds and renewable grant support will continue to provide funding for local schools to participate in the Museum's science programs.

