

A look inside the Chapultepec Site Museum. The design is inspired by historic folding screens found at the castle depicting scenes of the forest.



1a SECCIÓN



Un bosque limpió en su día el cerro de Chapultepec y el que queda se llama **EL BOSQUE MILLENARIO**.

Bosques y cañales
La gran tradición del Bosque de Chapultepec cuenta con diferentes tipos de cañales, donde operan un sistema de riego y cañales.

Finca San Rafael
Este finca, ubicada en Chapultepec, tiene un sistema de riego y cañales que opera desde hace más de 100 años.

Cañales
Este es un sistema de riego que opera desde hace más de 100 años.

Infraestructura
Este es un sistema de riego que opera desde hace más de 100 años.

Plantación
Este es un sistema de riego que opera desde hace más de 100 años.



EL BOSQUE MILLENARIO
La Finca San Rafael de Chapultepec es un sistema de riego que opera desde hace más de 100 años.

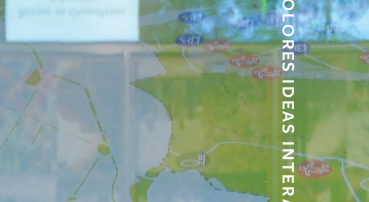
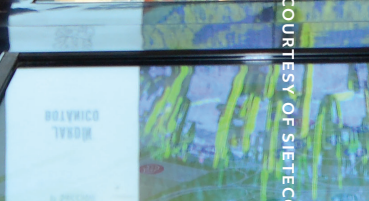
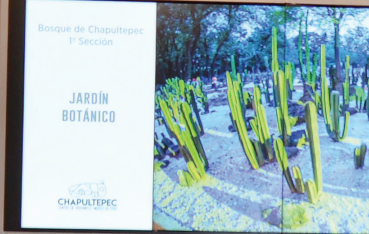
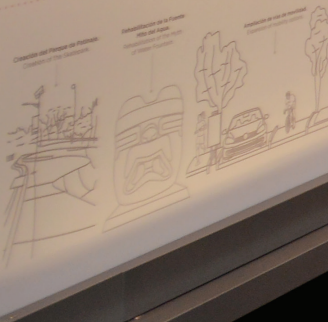
UN ESPACIO VIVO
Este es un sistema de riego que opera desde hace más de 100 años.

AVANZAMOS HACIA LA TERCERA SECCIÓN

En marzo de 2018, el Gobierno de la Ciudad de México y el Fondo de Cultura Económica (FCE) acordaron la implementación del Plan Maestro de Rehabilitación para la Tercera Sección, en el cual se establecieron diversas acciones para la recuperación del espacio público.

WE MOVED ON TO THE THIRD SECTION

In March 2018, the Government of Mexico City and the National Endowment for the Humanities (NEH) agreed on the implementation of the Master Plan for the Rehabilitation of the Third Section, in which various actions were established for the recovery of the public space.



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- Fuentes
- Museos
- Parques
- Jardines Botánicos
- Cultura y Recreación
- Lagos

PLACE AS THE CATALYST OF LEARNING IN MUSEUMS

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In Mexico City lies an immense park. Once sacred to the Aztecs, it is home to fountains, walkways, museums, and even a castle, and is now an iconic destination for locals and tourists who visit the city: Chapultepec Forest. Close to one of the park's many entrances, visitors can find a small but representative building from the 1700s. This historic structure had been the entrance to Chapultepec Castle. Today, it has been transformed into a site museum and visitor center, the perfect spot to learn about all you can do and what you will encounter in the three sections of this immense urban park. Outside on the patio, you can participate in many different workshops on art, botany, archaeology, and much more, all inspired by what is going on in the forest and its history. Whether you are looking for a physical, cultural, or natural experience at Chapultepec, the site museum can help you plan the perfect visit (fig. 1).

The Chapultepec Forest Site Museum is one example of how place can become a catalyst in museums, driving learning, planning, programming, and so much more. Sietecolores, a museum- and exhibition-design firm based in Mexico City, partnered with Chapultepec to develop the site museum using a place-based approach that informs many of our projects. Below, we share insights into how the Sietecolores team uses place to shape unique experiences that embrace communities where they are and prioritizes the local in order to spark learning through three recent case studies.

PLACE-BASED EDUCATION

All museums have views on learning, which should be reflected in every level of their design. When we begin a new project, our interdisciplinary team asks

Fig. 1.

The Chapultepec Forest Site Museum was created in a historic building that was once the entrance to Chapultepec Castle.



important questions of our partners: What do teaching and learning mean for this institution? What do they look like within this museum? How will the museum promote learning? The ideas that these questions generate lead us toward learning theories and approaches that we capture in a learning framework and use throughout the design process to guide decision-making.

One approach that we've found particularly useful is place-based education (PBE). PBE supports a constructivist view of learning, meaning that it allows for multiple interpretations and points of view and lets learners make meaning through their own prior knowledge and come to their own conclusions.¹ It sparks learning by connecting concepts and ideas to the places learners are, proposing actions such as exploring our surroundings, learning from community members, listening to neighbors' stories, and participating in cultural traditions – all of which human beings have been doing since the beginning of time. And yet, over time, many education systems have forgotten to center the idea of place when planning learning experiences, resulting in unrelatable, unmotivating, and irrelevant curricula. This is why many researchers have made it their purpose to rescue the approach and bring it back to the classroom.²

PBE's principles are pertinent to museums, too.³ Museum practitioner and author Janet Petitpas explains how a place-based approach “promotes the uniqueness of the institution within its community so that it does not resemble any other museum in any other part of the world.” She also highlights how, “people have connections to specific places and learning is stronger if new ideas presented by the Museum link with emotions or knowledge that visitors bring with them.”⁴ Museum planner Jeanne Vergeront continues these ideas, stating:

[P]lace matters. It matters to children discovering who they are, exploring their world, and finding their place in it. Place matters to families growing

and deepening connections to their communities. It matters to communities staying vibrant and being resilient. And place matters to visitors and newcomers who want to know and feel a place and what makes it distinctive.⁵

The main principles of PBE that influence our design approach at Sietecolores are:

1. **An emphasis on the local:** PBE takes the learners' environment as the starting point from which to teach new concepts. Instead of explaining abstract ideas that may seem unreachable or unrelated to the learners' experiences, PBE is rooted in what is local in order to engage and motivate learners.
2. **Community involvement:** Involving locals (artists, scientists, and other professionals) during teaching and learning encourages representation and an appreciation for the surrounding community.
3. **An inductive approach:** PBE is an inductive methodology, meaning that it moves from specific examples to general conclusions. Place is simply the starting point. “Local issues serve as models for understanding global challenges.”⁶
4. **Real-world problem-solving:** PBE allows learners to face real situations that encourage problem-solving with the use of strategies such as design thinking or inquiry-based methodologies.⁷
5. **Interdisciplinarity:** It focuses on challenges and aspects of place that have to be examined from multiple perspectives and through the lens of different disciplines in order to have the whole picture.⁸
6. **Learner-centered:** Starting with place makes the experience personally relevant to learners, giving them an active role – that is, “voice and choice” – in their learning process.

The three projects below, each in a different stage of development, demonstrate the ways our team uses PBE to create meaningful museums that are connected to their local audiences in ways that are relevant, impactful, and meet local needs.

MASTER-PLANNING A SCIENCE CENTER FOR THE COMMUNITY

Starting with the local and bringing real-world issues to the table helps us to address the needs we see among the community for whom we are designing a space. “You need to learn how to listen, to then be able to design,” says Amparo Leyman, our long-time education advisor. Our methodology always begins with research and reaching out. Our experience shows that when people feel seen and heard at a museum they are more likely to root for the institution, participate in it, and take care of it.

In early 2022, as part of a science center we are currently developing in the Southwest region of the United States, we conducted 11 two-hour focus groups and five one-hour interviews to help us understand the needs of community members and the type of museum that



Fig. 2. Our team conducting a focus group with the local community in order to conceptualize a science center that caters to its needs and interests.

they needed. In the course of our research, we talked to 79 people, including teachers, university professors, industry leaders, local authorities, and community organizations (fig. 2).

We soon discovered the need to showcase STEM career paths in the area. “From an education standpoint, in the next 10 years, STEM careers will be the ones in highest demand in the state,” one participant told us. “[The new museum] should help prepare the people of the community for the jobs that will be offered by companies. ... Don’t have them looking for their staff [elsewhere]. Let’s make sure that they know they can find these people [here],” commented another community member.

In response, we decided to conceptualize the science center with PBE as its core. We mapped out the scientific activity taking place within the geographical area and identified the local spaces – from their own homes to local industries and research centers – where citizens are in touch with science and technology every day. We then defined a thematic structure that connected the building blocks of science to particular spaces within the community and used that to help select exhibits. Our goal is for the museum to help visitors understand their connection to science through familiar spaces and organizations, as well as have them learn about other places in their community where science happens, even if those spaces are currently less known to them.

In designing the physical space, we wanted to draw on the idea of exploring the building blocks of science as a way of understanding both the local community and the world. Inspired by the museum’s site in a soon-to-be-converted warehouse, the team defined a look and style for the exhibits that resembles a storage space filled with surprises or a learning lab where you can tinker with and explore essential concepts. Environmental elements like random wooden boxes will be used to spark curiosity and a sense of mystery among museumgoers.

In the next stage of the project, we are looking forward to working with local scientists and leaders who will help us fully develop the concept and turn the space into a true hub for the community.

DESIGNING A CHILDREN'S MUSEUM IN A PLACE WITH HISTORY

Opened in 2016, Trapiche Museo Interactivo is a children- and youth-centered interactive museum in the city of Los Mochis, Sinaloa, in Northwest Mexico – a city that was once a thriving center of the sugar industry. Trapiche, which means sugar mill in Spanish, is an initiative of the Center for Innovation and Education (CIE) of Los Mochis. When we began the project, statistics on formal education attainment in the community indicated that over 24 percent of middle school students and over 31 percent of high school students were failing, and the dropout rate of nearly 16 percent was well above the national average. Standardized testing indicated that students' level of achievement in mathematics, science, and reading was very low; 44 percent of the population 15 years and older had not achieved an elementary school diploma, and 6 percent of the population was illiterate.⁹ CIE wanted to create a space that helped the town become a true “learning city,” as described by UNESCO, building its foundation on the history, traditions, and unique characteristics of Los Mochis.¹⁰

But these numbers were only part of the story. A diagnostic study to further explore these findings and justify the need for an interactive museum in the city was carried out by researchers John Falk and Lynn Dierking.¹¹ Using a survey, they collected data from 1,143 children ages 10 to 12 in public and private schools in both rural and urban areas within the state of Sinaloa and conducted an additional 300 interviews with local children and parents. Their results indicated that the people of Los Mochis did want an interactive museum in their hometown: 54 percent of children in rural communities and 42 percent in urban areas had never been able to go to such a space because there

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weren't any nearby; indeed 40 percent of the rural respondents had never even heard about such spaces. And results showed that almost all parents wanted their children to learn about STEM; they simply did not know where or how to gain access to this education.

When the time came to conceptualize Trapiche, PBE was an obvious framework, both because the city currently lacked a creative, community-based, and locally inspired space, and because it had so many attributes that made it vibrant, promising, and proud of its roots. The museum was designed as a space where people could build citizenship and a sense of belonging, while also developing the 21st-century skills, such as critical and creative thinking, that a true learning city requires.

Having identified PBE as our conceptual framework, we began to examine the city's past and present, as well as that of the sugar refinery that would host the museum. Most of the city's history is rooted in the construction of a successful sugar refinery by American businessman Benjamin F. Johnston. Johnston's interest in travel and culture allowed Los Mochis to have the feel of a worldly town; he opened a botanical garden that he filled with plants and beautiful birds for the enjoyment of the local community. The sugar refinery ensured the growth of the city, helping it become one of the most economically active in Mexico in the early 20th century. The refinery and its surrounding buildings are part of a historic neighborhood called “La Americana.” The golden days of this neighborhood were long gone when Impulsora de la Cultura y las Artes (IMCA) claimed the land in 2013 and ensured its proper conservation. In 2016, the site became the home of Trapiche, highlighting the importance of tradition but with an eye toward the future.

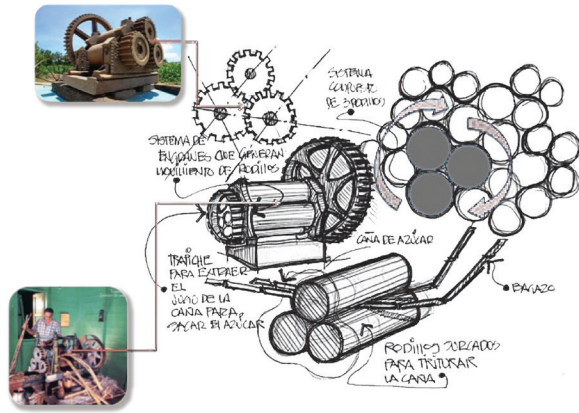
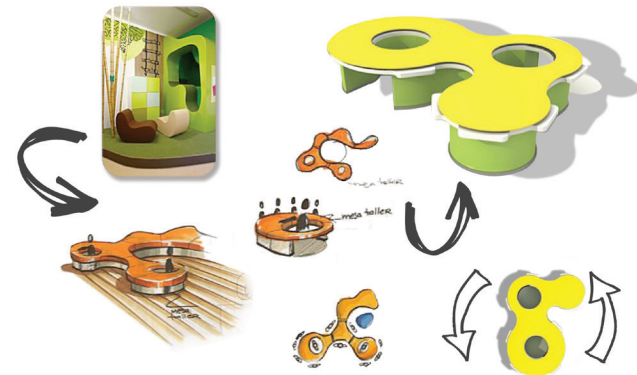


Fig. 3. The look and style chosen for Trapiche is based on the machinery once found in the old sugar refinery where the museum is located.

machinery throughout the site, which pay homage to the building’s past and serve as environmental elements that make the space unique (fig. 4).

The refinery also inspired the design of an entire exhibition hall dedicated to local culture and heritage that showcases the city’s origins in the sugar industry. Visitors are invited to discover the sugar-refining process by operating simple machines such as pulleys and levers that display the entire method – from the harvesting of crops to the packaging of the finished product (fig. 5). Below, a map of the city frames the room and invites visitors to keep walking to discover a hallway filled with stories and testimonies from local residents whose lives have been touched by the legacy of the sugar industry.



The refinery is not merely a receptacle for exhibitions and programs. Our team wanted to highlight its history and have it accompany people through their visit to consolidate the learning experience. That is why the look and style of the exhibit furniture was inspired by the shape of the machines inside the refinery, especially the enormous gears that turned in unison (fig. 3). Also, the museum features 35 pieces of preserved

Trapiche’s exhibits also encourage learners to solve real-world problems, particularly those that affect their local community. An exhibit that explores renewable energies teaches visitors about aerogenerators, or wind turbines, which can be found in the region. Visitors assemble an eolic generator, learning about the pieces and elements that make it functional. Then, using their hands, they build an aerodynamic paper figure and can observe it flying inside an air tube. A digital interactive provides additional information not only on aerogenerators, but other renewable energy initiatives that can be found in Los Mochis and around Mexico.



Fig. 4. Machinery recovered from the sugar refinery now helps create a sense of place among visitors to Trapiche.

Another way to embrace a place-based approach is by inviting community members into the exhibition-making process. While developing a particular exhibition, we wanted visitors to recognize the cultural and natural importance of the train, “El Chepe,” so our team worked with local experts and suppliers to ensure that the multimedia experience we were designing showcased the beauty of local scenery and encouraged people to go to the actual sites. In the museum, visitors sit in a reproduction of the train while they interact with a screen that asks them questions about what they are observing through the “windows” beside them (fig. 6).



Fig. 5.

Exhibition interactives introduce visitors to the sugar-refining process that was once carried out in that very same building.



Fig. 6.

“El Chepe” exhibit, a simulator that recreates the representative train ride in the region.

Trapiche's success lies not only in its uniqueness, but also in the way the locals have made the space their own. Visitors trust the museum to be a hub for culture, learning, and recognition. They indicate that the space has been truly important for the city and how proud they are of it: "We were lacking a space like this in town; simply, the best investment they could have made," one of them says. "The visit is a must if you come to Los Mochis...I am so happy that the city has places like this," another adds.¹²

CONSOLIDATING A SITE MUSEUM WITHIN A CENTURIES-OLD FOREST

And now, let's return to Chapultepec Forest and the site museum and visitor center that opened there in 2018. We decided to implement a PBE approach here because we wanted the space to highlight the idea that, "the more you know, the more you see; and the more you see, the more you know." That is, the more you are aware of the forest's history, features, activities, and sites, the more you can enjoy them fully. And then, the more you explore the forest and participate in the activities it offers, the more you can take from the site museum.

Our designs for the museum came alive when our team became inspired by the forest's iconic sites, particularly Chapultepec Castle. Historical folding screens at the castle depict scenes from Chapultepec's history using incredible amounts of detail and vivid imagery. The museum's long walls and high ceilings inspired the team to tell the site's history in the same way, as though the visitor were contemplating a folding screen ([intro image](#)). The content and imagery on the walls is complemented by the display of significant objects from the site and digital interactives that help visitors further explore the forest's history and current offerings.

Since its inauguration, the site museum has become a vibrant hub for forest visitors. Miguel Álvarez, head of the museum's operations, shares that it has

regular, repeat visitors now, including people from the surrounding neighborhoods and children of the forest's merchants. The forest serves as inspiration for the workshops and events at the museum – all developed using a PBE approach – which connect with other organizations within Chapultepec, including other museums, cultural centers, and even the zoo. Álvarez emphasizes that their programs connect Chapultepec to larger environmental issues: these have included botanical art workshops with artists and scientists that show visitors how to appreciate the local flora without tearing or damaging it, and zoology-inspired activities that introduce visitors to species that can be seen at the zoo or that are highlighted in exhibitions around the forest.

The museum has a large following on social media thanks to its consistent posts and positive interactions with visitors. In addition, a comment book on site encourages visitors to share their thoughts on the museum with staff. Six-year-old Andrés left this thankful message: "I came to visit with my parents the Forest and saw the animal exhibition. Thank you." An anonymous visitor enthusiastically wrote: "This museum has helped me understand a bit of the history of this city, as well as value the importance and love that its inhabitants have for this magnificent space."¹³

FINAL THOUGHTS

Developing a museum or exhibition requires the alignment of an interdisciplinary team of professionals including designers, subject-matter experts, educators, engineers, and many more around common ideas and goals. When it comes to creating spaces where visitors feel welcome and connected, PBE can be our ally. This approach to learning helps us make objective decisions regarding content selection and display, exhibition design, and programming, while centering a sense of place and community in any type of museum.

While not all museums may have a place-based approach embedded in their core concept, PBE principles can

be implemented in both small and large initiatives and to different degrees to create meaningful experiences for visitors. For some, that could mean introducing listening sessions with the community whenever a new exhibit is going to be designed or renovated. For others, it could mean introducing local examples when docents are interacting with the public or creating outreach programs that involve community members in new ways.

In any way we use it, PBE helps us create experiences where visitors feel welcome, inspired, and curious. It is a full-circle moment when museums are realizing that they ought to stay alive for and thanks to the very communities they serve. ■

Acknowledgements

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- 1 George E. Hein, *Learning in the Museum* (London: Routledge, 1998).
- 2 David Gruenewald, “Best of both worlds: A critical pedagogy of place,” *Environmental Education Research* 14, no. 3 (June 2008); and Gregory Smith and David Sobel, *Place- and Community-Based Education in Schools* (Oxford, UK: Taylor & Francis Group, 2010).
- 3 See, for example, The Association of Science and Technology Centers (ASTC), “The Power of Place,” *Dimensions* (May/June 2016): <https://www.astc.org/tag/dimensions-may-june-2016/>.
- 4 Janet Petitpas, “Place-Based Learning in Museums,” blog post, *Museums Now*, October 25, 2012, <http://museums-now.blogspot.com/2012/10/place-based-learning-in-museums.html>.
- 5 Jeanne Vergeront, “Place Matters,” blog post, *Museum Notes*, July 31, 2013, <https://museumnotes.blogspot.com/2013/07/place-matters.html>.
- 6 Teton Science Schools, “Getting Started with Place-Based Education, Step-by-Step,” June 19, 2019, <https://www.tetonscience.org/getting-started-with-place-based-education-step-by-step>.
- 7 Design thinking is a method for innovation. Basic steps include inspiration, ideation, and experimentation. This type of thinking allows visitors to make a meaningful impact on real-life issues. See, Tim Brown, “Design Thinking,” *Harvard Business Review* (June 2008): <https://hbr.org/2008/06/design-thinking>. Inquiry-based thinking comes from asking as many questions as you can to find, in this case, the answers to local needs.
- 8 MIT Professor Neri Oxman maintains that the world does not function in silos, but is interdisciplinary. In fact, she says we live in the “age of entanglement.” She argues that art, science, design, and technology are interconnected and the only way to solve today’s challenges and innovate is through their intersection. Neri Oxman, “Age of Entanglement,” *Journal of Design and Science* (January 13, 2016): <https://doi.org/10.21428/7e0583ad>.
- 9 Indicators by Secretaría de Educación Pública (SEP) and Instituto Nacional de Evaluación Educativa (INEE), 2015.
- 10 UNESCO’s “Learning Cities” initiative is a global network composed of places that “promote lifelong learning for all” by revitalizing communities, mobilizing resources toward education, facilitating learning, and promoting the use of learning technologies. For more, see <https://www.uil.unesco.org/en/learning-cities>.
- 11 John Falk and Lynn Dierking, “Los Mochis Museum Impact Study,” 2016, conducted for CIE and Sietecolores.
- 12 Comments from museum visitors on Trapiche’s social media.
- 13 Comments from Chapultepec Site Museum visitors found in their *Visitors’ Book*, 2023.