

# Case Study: Lone Star Dinosaurs

As the first step in the master planning process, we worked with Fort Worth's curatorial and educational staff to define a decision-making framework for this exhibition. This included identifying their core audience (5-11 year-olds and the people who bring them) and clarifying their educational and experiential mission of providing Extraordinary Learning Environments, FWMSH's institutional mission, for that audience. This work resulted in a set of tangible and measurable objectives that helped shape every aspect of the exhibition. Additionally, the overall message of the exhibition—"Science is not just a collection of facts or a body of knowledge. It's a way of thinking."—was established.

This message was then broken down into component learning elements about science process that would be explored through the various exhibition experiences. We also worked with the museum's curators, in addition to paleontologists from several Texas universities and advisors from the National Science Foundation, to establish three primary paleontological content messages through which these processes of science would be explored.

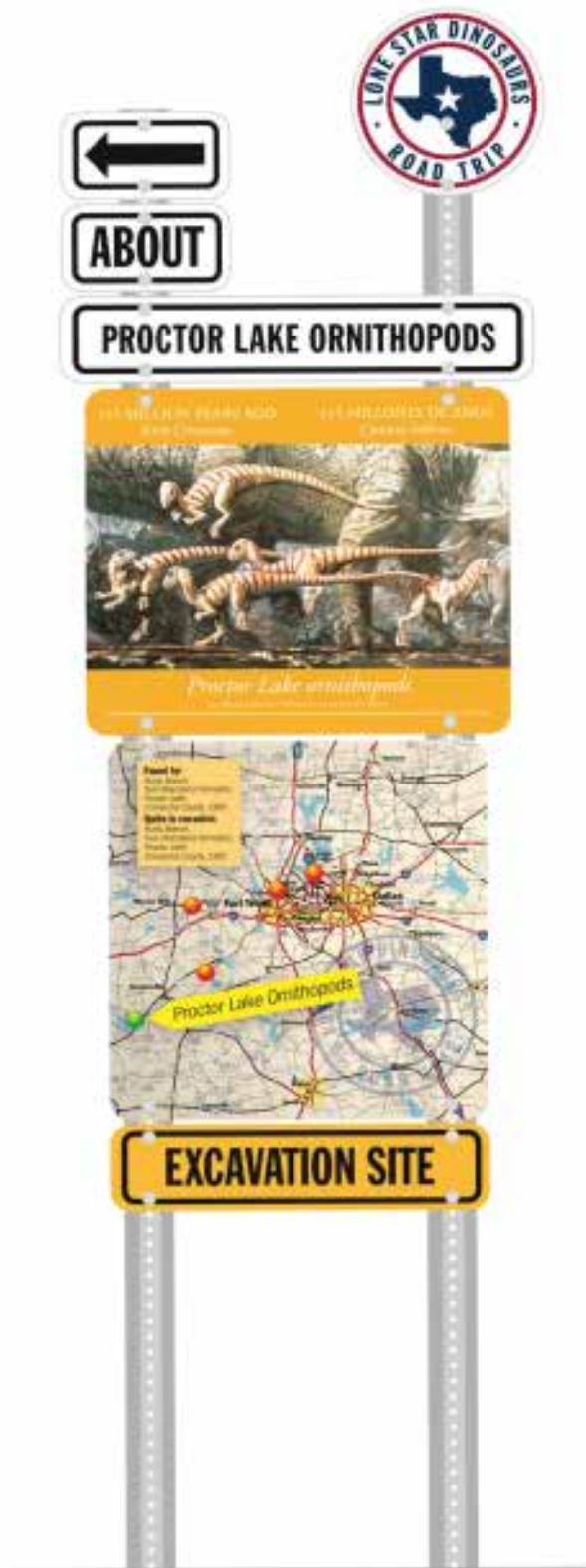


*Prototyping "Trackway," an interactive challenge that combines fossils, measurement and custom multimedia*



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To further the exhibition content development process, FWMSH and Hands On! worked with Randi Korn & Associates to conduct comprehensive front-end evaluations of people's understanding of and relation to the processes of science at large and paleontology in particular. This front-end evaluation showed us that while visitors are very interested in dinosaurs, they need significant help making meaning when observing fossils. Based on this data, we refined our exhibition messages and dedicated a large entry experience to help visitors "learn to look"—the first step in the inquiry process of scientific thinking. Video modeling and a strong immersive Field Site environment were chosen to help a wide range of visitors, particularly young visitors with nascent reading comprehension skills, feel comfortable as they are encouraged to collect data, interact with fossils and, most importantly, start asking questions like real scientists.

This inquiry-based approach mirrors the scientific method and motivates visitors to explore their questions further through the rest of the exhibition. Additional formative evaluation conducted by FWMSH and Hands On! of the video components and associated activities clearly demonstrated that visitors liked this approach and felt more confident to move on to a Lab area where they could interpret their observations, experiment, and test their ideas using real fossils and tools of science from the museum's collection. Not until the very end of the exhibition will the visitors see fully articulated dinosaurs. Here, we have the unique opportunity to create a place that showcases the stories and the people, several of them children, behind the incredible discoveries of each Texas dinosaur. This unconventional organization places the emphasis on a process-based temporal and conceptual relationship with the dinosaurs, not just on the bones themselves.



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With the main messages, content and evaluation results in hand, the team worked together to develop the individual interactive experiences. Hands On! worked with the curatorial staff to review collection elements and scientific tools and then adapt them into age-appropriate experiences that would appeal to multiple learning styles. The experiences were grouped into three sections, each of which supports one of the main paleontological content messages. Within each group, the experiences were chosen and designed to allow visitors to explore multiple processes of scientific inquiry, allowing for a layering of process and content that places inquiry into a real-world, paleontological concept that visitors can grasp. These process skills are repeated in different ways across all three content groupings, creating a conceptual redundancy that helps the visitor hone their inquiry skills through multiple contexts.

Once the exhibit concepts and groupings were established, Hands On! began working on the design and communication of each element. Our communications team worked hand-in-hand with FWMSH's content and education team to concept and script each label element at an age-appropriate level that conveys key content and inquiry elements. For instance, each label begins with a question that ties the exhibit to the larger concept of "building a picture of the past" to guide the visitor directly into the experience. Additional content is presented in an engaging manner, and the label ends with an "inquiry moment" that introduces key science thinking terms in an open-ended, thought-provoking way. All copy was reviewed by paleontologists and educators outside of the main

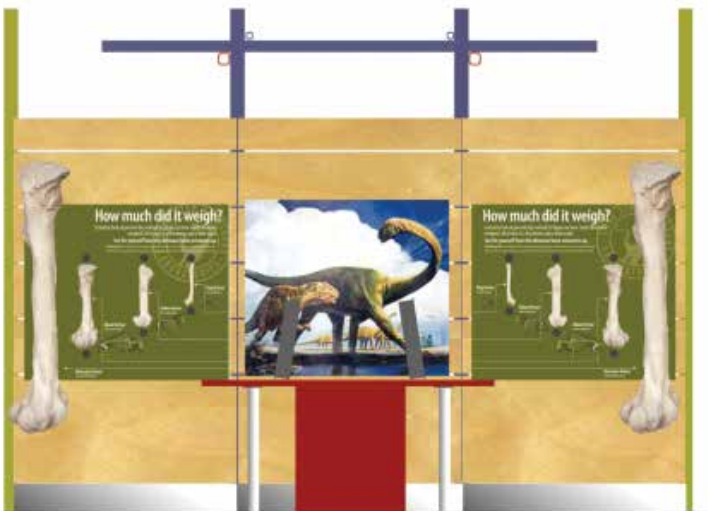
development team to ensure accuracy and age-appropriateness through an objective lens. The exhibition is bilingual to support the needs of FWMSH's large Spanish speaking audience, so all copy was given an additional review by our translator, an interpreter at the United Nations.

These labels were tested with children and adults during our prototyping process, in which we test exhibits with visitors at a local children's museum, Great Explorations in St. Petersburg, Florida. Hands On! uses a behavior-based testing matrix to gauge visitor reactions and the overall success of a prototype. This testing is further supplemented by interviews and videotaped observations that are reviewed by the entire content team. In the case of one exhibit, "Measure a Femur," the team developed and tested four iterations of the exhibit label to find just the right presentation of the content to appeal to the broadest range of visitors possible.

One of the most exciting elements of this exhibition is the inclusion of real-time research being done by the paleontological team at FWMSH. They are making new discoveries every day, virtually in backyard of the museum. The exhibition designed by Hands On! with FWMSH invites visitors to join in this ongoing discovery and allows them to become active participants in the process of scientific inquiry by placing the emphasis on "How can we find out?" rather than "What do we already know?" Through this inquiry-based approach, the visitor can gain knowledge, gain skills, and experience what scientists already know—that science is a living, changing body of knowledge borne from the joy of discovery.

*"Hands On! is rigorous in developing multiple critical communication strands in children's exhibitions, particularly in the ways they achieve conceptual redundancy through variety. They develop a palette of experiences that enable children to learn through multiple modalities that support questioning, concept building and big ideas. Our collaborative work on this exhibition has been both fun and thoughtful, and we're thrilled with the results."*

*Colleen Blair, Director of School Services and Visitor Advocate  
Fort Worth Museum of Science and History*



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