

Effective Exhibitions Should Make Lasting Connections Through the Emotional Mapping of Storytelling

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Fig. 1. Aquarium guests admiring jellies.



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When was the last time you read a book you couldn't put down – or saw a movie that stayed with you and changed your perspective? Chances are the author or director carefully considered an intentional storytelling arc that thoughtfully engaged you emotionally, as well as intellectually.

How do museums create these same kinds of transformative experiences that capture the imaginations, hearts, and minds of visitors? How do we intentionally foster emotional engagement and responses to museum experiences?

In “The Secrets of Emotion,” an article in the July/August 2021 issue of *Museum* magazine,¹ author Pablo P. L. Tinio addresses how psychology presents opportunities to measure the emotional responses of visitors in museum exhibitions, particularly in response to individual objects. Tinio explores how the implementation of nontraditional scientific data collection methods, often used in laboratory settings, can assist in understanding and serving museum audiences. Moving beyond traditional focus groups and interviews, the article challenges museums to adopt the use of emotional heat maps, in the observation of current experiences as well as the future

presentation of content, to understand emotion affordance and intended stimulation in curated spaces. Tinio also points out that these emotional responses are cumulative within the museum environment.

The National Aquarium ([fig. 1](#)), located in Baltimore, Maryland, and Solid Light, an exhibition design and fabrication firm in Louisville, Kentucky, believe in the benefits of emotional heat maps and have adopted similar but unique approaches into their design processes. These approaches address the singular and collective emotional engagement throughout an exhibition, particularly as it relates to learning and memory.

Working together, Solid Light and the National Aquarium are advancing this concept by developing an “Emotional Experience Vision Plan” that utilizes emotional mapping. In this article, we share how we define emotional mapping; how it was implemented at the American Civil War Museum in Richmond, Virginia; how it continues to be developed; and how it can inform future planning of exhibitions.

What is Emotional Mapping?

Emotional mapping is a methodology for planning and designing experiences to

create impact and resonance by purposefully engaging the emotional human brain. By placing emotions at the beginning of the design process, developers and designers plan the arc of an experience to create the greatest impact on memory and engagement, considering multiple aspects, such as story, narrative tone, pacing, calls to action, objects, and ease of travel through the space.

Emotions and learning are inextricably linked, and much scientific and educational research has been done to study this connection on the key aspects of learning – attention, memory, and motivation. In the book *Emotions, Learning, and the Brain*, neuroscientist Antonio Damasio states that “meaningful learning and thinking are inherently emotional endeavors” and “we feel, therefore we learn.”² Author Mary Helen Immordino-Yang, together with Damasio, posits that “emotions are the rudder of thinking.”³

When experiences are developed to entice and activate visitors’ intellectual and emotional responses, their memories of the experience are more likely to be rich and lasting. This can be true for positive and negative emotions alike, but excessive or prolonged negative experiences are not optimal to cognition, recall, or achieving positive association.⁴

A Design Challenge Solved with Emotional Mapping

In 2015, the American Civil War Museum selected Solid Light as its partner to create the exhibitions in its new museum focused on the 1861–65 conflict over slavery that pitted North against South and resulted in hundreds of thousands of deaths. The

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museum wanted to tell the war’s highly emotional story in a way that would connect with today’s visitors and current issues of racism and political division; challenge broad myths regarding the war’s causes and events; and tell diverse first-hand personal accounts of the war. The team was concerned that the sustained emotional intensity of the story would diminish visitors’ capacity to engage and learn anew. So, Solid Light developed a process of emotional mapping. The team intentionally planned storytelling to

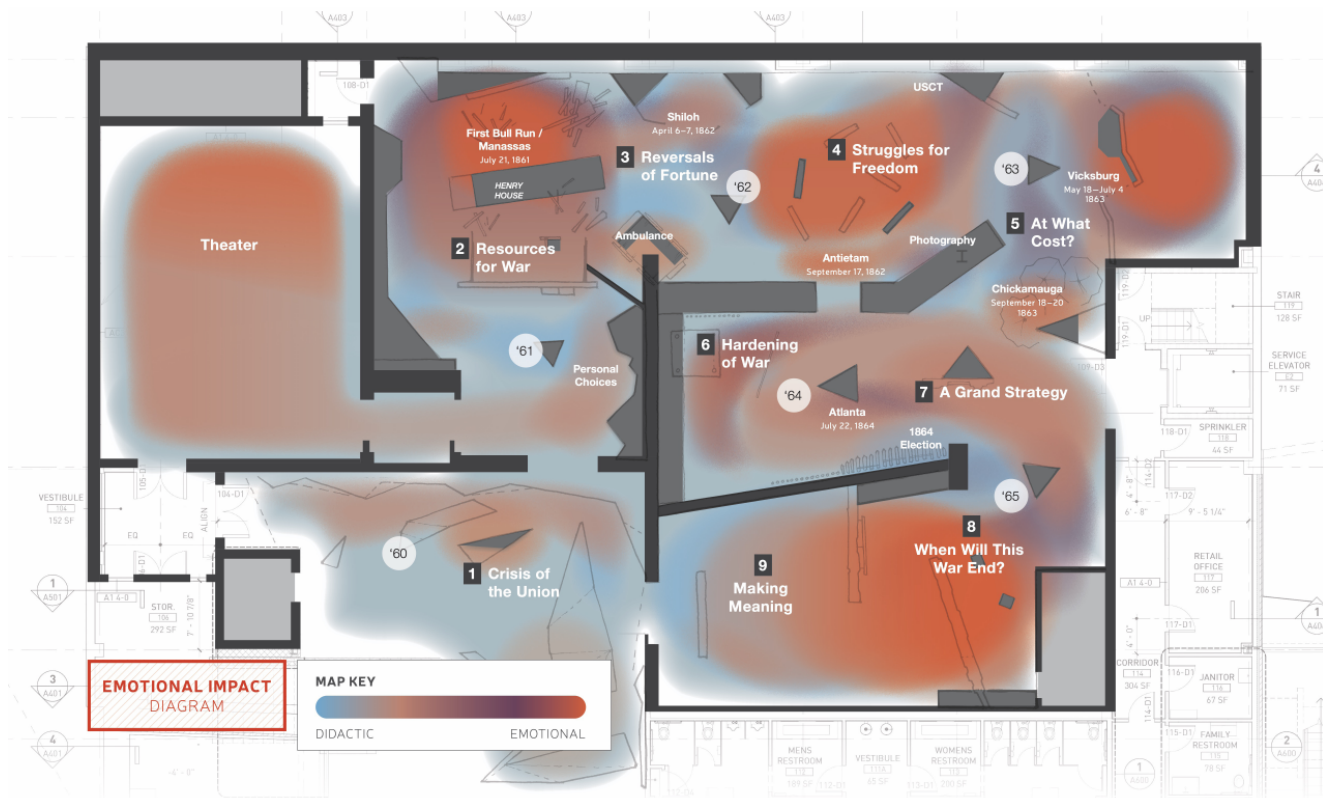


Fig. 2. Red areas reflect high-impact areas with multisensory, multimedia experiences; blue areas indicate emotionally restful, didactic spaces in the American Civil War Museum.

maximize the impact for visitors by carefully pacing the flow throughout the space. This allows the visitor to experience complex and intense emotional narratives and stories with periodic relief by inserting places for emotional rest to maintain story and learning engagement.

To begin, the team of designers and writers mapped the story within the space's floorplan, layered the highly charged emotional experiences on top, and adjusted as necessary. For example, the first-person accounts of the loss of loved ones in the 1861 Battle of Manassas was spaced away from stories of the inhumanity of slavery as told by enslaved Black people seeking freedom. Next, Solid Light brainstormed how to express each story in the physical space with this tool as a guide. For instance, evocative sculptural structures were conceived

that incorporated multimedia for the two previous examples. The result was an emotional map for the exhibition (**fig. 2**).

Exit surveys conducted by the museum show that 80 percent of visitors agreed with the statement, "I connected personally to historical stories I encountered at the museum." Additional survey responses indicate that the pacing of the visitor experience led to new understanding and reflection regarding the war.⁵

The aquarium's mission – to inspire conservation of the world's aquatic treasures – guides everything it does. Through generations of experience in the field of informal learning and testing of current conservation psychology principles, the aquarium has learned that providing only scientific, didactic information isn't enough. Engaging guests emotionally is needed to drive long-term change.

In 2011, the aquarium completed its first internal evaluation of guests' emotions. "The Emotions Study" tracked and recorded visitors' feelings on selected parts of the exhibition path (fig. 3). Though guests were generally inspired and happy when viewing the living exhibits, there were undesirable levels of stress and fear before and after the living exhibit. This could mean guests

need more time to form stronger emotional connections with animals, stories, and calls to action. And perhaps when leaving the area, anxiety could easily replace the less-developed inspirational and happy emotions that had just occurred.

Building on this study, the exhibition *Blacktip Reef* opened in 2013 and was purposefully designed to cultivate strong emotional connections by immersing guests in the sights and sounds of an Indo-Pacific reef. As the sole exhibition on Level One, the 260,000-gallon living exhibit is visible from the levels above and from the underwater viewing area below. The design team decided to take advantage of these multiple viewing opportunities to engage guests emotionally. New glass railings

What emotions do visitors feel throughout Level One?

The visitor experience traverses through a sequence of emotional highs and lows dictated by an innumerable set of provocations. While the specific emotions are impossible to qualify, we can generalize the emotional experience into four basic emotions based on visitor data, tracking, sensory mapping, and many hours of direct observations.

- Inspiration
- Happiness
- Stress
- Fear

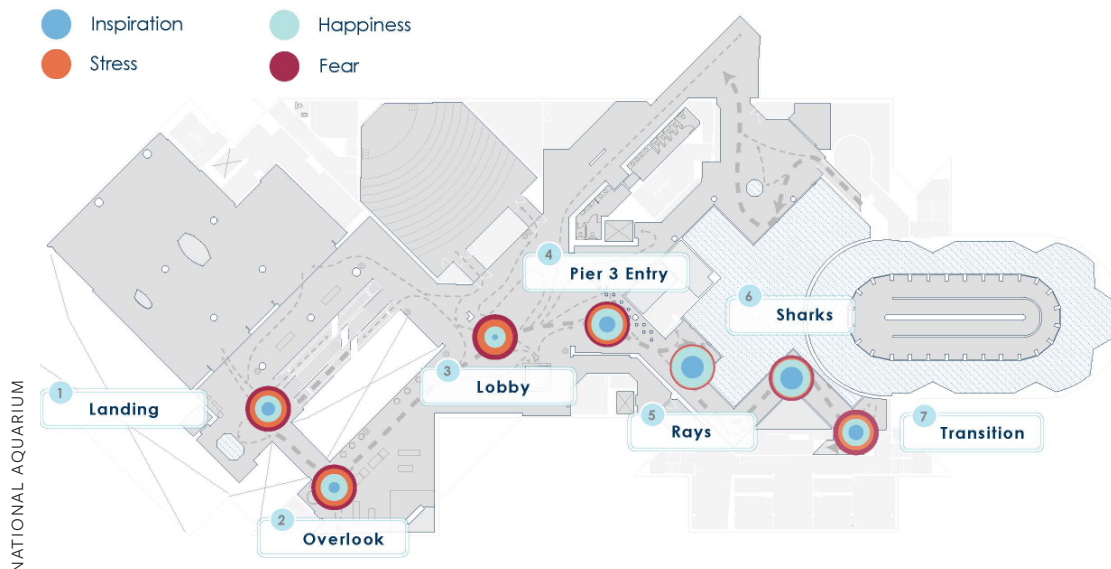
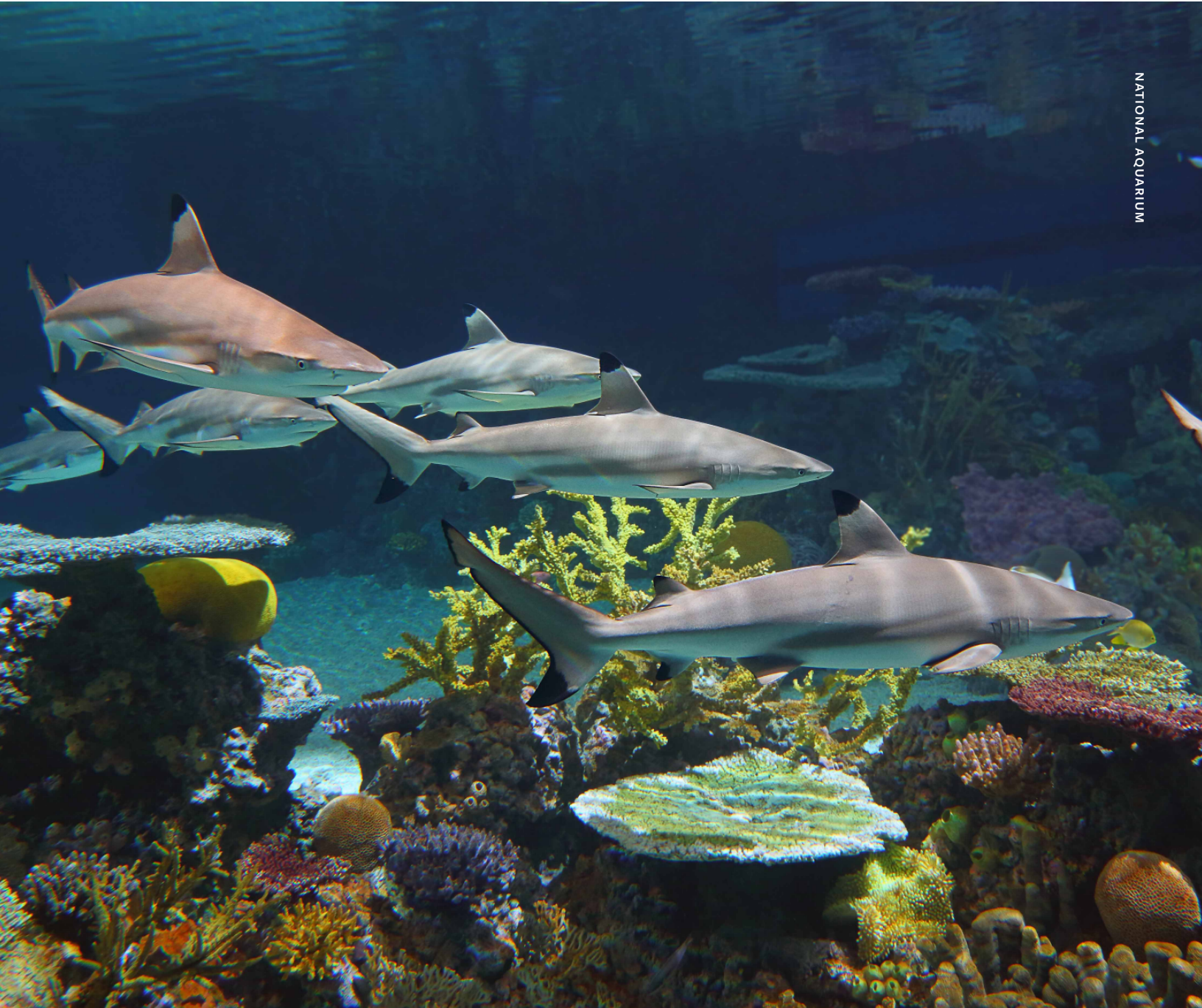


Fig. 3. By observing behavior and body language, the team noted when they saw one of four chosen emotions – inspiration, happiness, stress, or fear.

Fig. 4. The 260,000-gallon living exhibit features over 3,000 pieces of authentic-looking coral and is home to 70 species of reef animals, including blacktip reef sharks, wobbegong sharks, and zebra sharks.



were installed to offer wider, more open views of the habitat and animals. Changes to the underwater viewing area included new lighting, comfortable seating, and a large, floor-to-ceiling, bumped-out curved window inviting a slower pace conducive to close observation and reflection (fig. 4).

Taking on an enormous risk at the time, the team decided to act on the idea that emotional engagement might be more effective than didactic information. With a minimalistic approach to content, the exhibit design centered on the beauty and wonder of a healthy and diverse ocean reef with the goal of nurturing empathy and appreciation for the aquatic animals and habitat as a first response.

In the summative evaluation, Audience Viewpoint Consulting (AVC) of Herndon, Virginia, reported that regardless of the questions asked concerning the area's main message, conservation messages, and guest engagement, most guests referenced individual animals and the gallery's main message, "There is a surprising diversity of life in a healthy coral reef." These responses were not a surprise, given that viewing and appreciating animals is often the cornerstone of an aquarium experience. However, when asked if something surprised them, most visitors said "yes," citing "the animals in the gallery and the lower and upper viewing areas provided by the exhibition." According to AVC's report, "There is evidence from various items in the interview that visitors were having a variety of emotional reactions to the gallery, including enjoyment and wonder." The beauty and wonder of *Blacktip Reef*'s living exhibit were also cited as a main source for being inspired to do something after the visit – including taking action to protect reefs.

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In the same year, the National Aquarium launched BLUEprint, a bold and far-reaching strategic vision that's redefining its future. It features four thematic pillars, one of which is a long-range, 30-plus-year plan that will define, in conceptual architectural terms and means, what renovations, modifications, additions, and new facilities are required to achieve the aquarium's goals to advance its vision and mission. Referred to as the Aquarium Framework Plan, it aspires to meet the changing needs of the National Aquarium and its communities while keeping its unique character, design philosophy, exemplary practice in animal care and welfare, and conservation emphasis.

Fig. 5. Line drawing of emotional journey through National Aquarium mapped by Solid Light proposing unique top-level and complementary emotions for each of the five floors of living exhibits supporting the aquarium's overall goal of engagement with its animals and conservation messages.

The facility, however, is the main impediment to improving the guest experience and accommodating future growth. Located on a pier with water on three sides, the aquarium's original building, which opened in 1981, was organized as a linear sequence of living exhibits. As additions were added, this linear pathway became compromised. Guests typically begin with the *Blue Wonders* exhibition (the five floors of living exhibits in the original building), then move randomly around the rest of the aquarium. This makes exhibit flow linear to start and complex to finish, resulting in higher levels of stress and anxiety for guests, as confirmed in the 2011 Emotions Study.

The Aquarium Framework Plan is trying to correct some of these inherited challenges and respond to what it means to be a 21st-century aquarium. It is a road map and living document that will guide the National Aquarium as it evolves, providing a methodology for directing change in the physical environment. Including emotions in this process reminds the team that human-centered, emotionally mapped experiences can encourage guests to discover and learn more about themselves, their place in the world, and their unique ability to make a difference. For that reason, emotions become a justifiable factor in planning the sequencing of the aquarium, defining the architectural space, and informing when guests are the most receptive to engage with living populations, exhibits, and stories – and act on conservation messages.

Can Emotional Mapping Help Plan the Future?

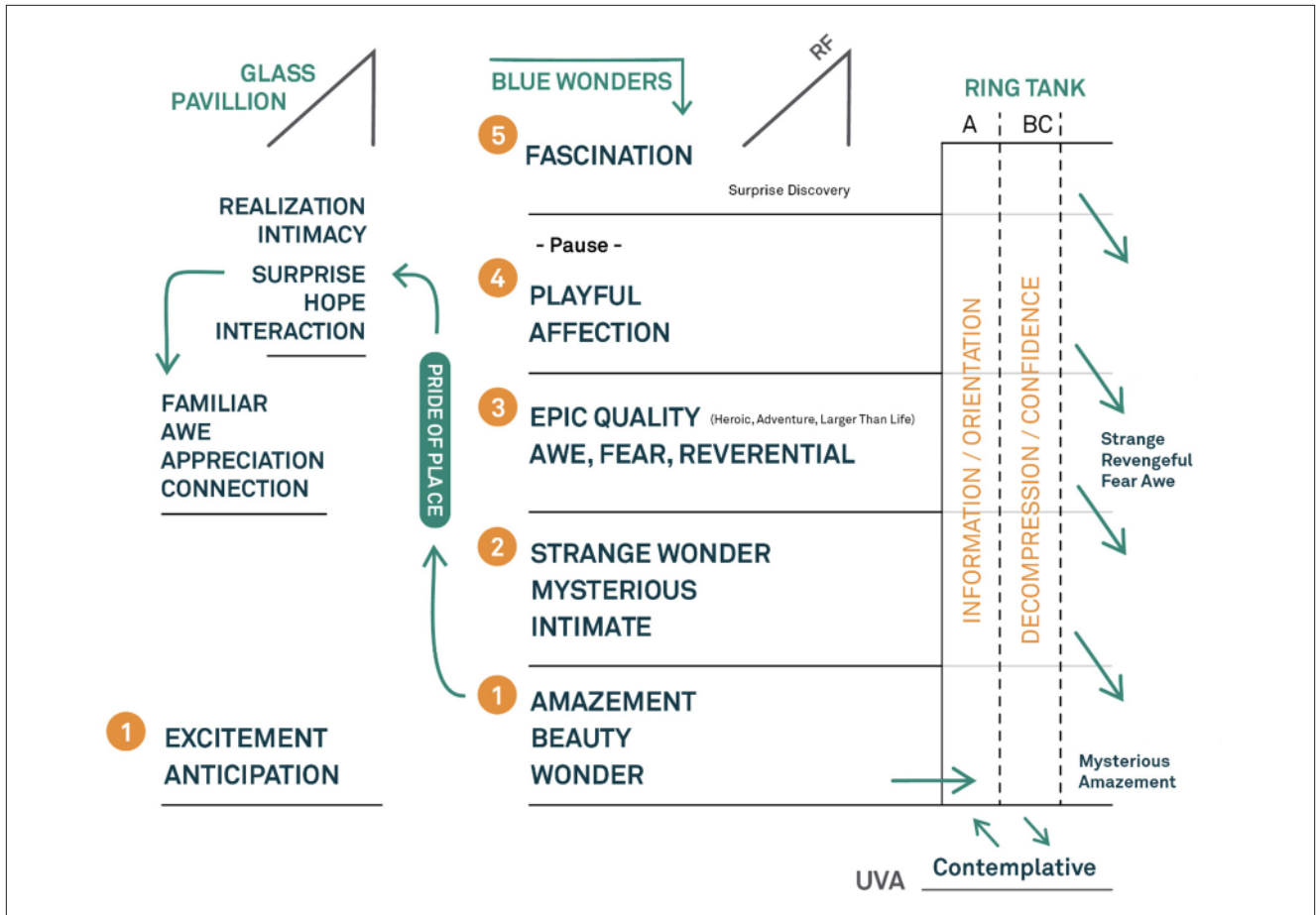
As the first draft of the Aquarium Framework Plan began to take shape, the project team

started exploring different lenses to inform and evaluate it. Familiar with Solid Light's storytelling and emotional mapping work, the aquarium reached out. The two organizations are now collaborating to learn and explore how a charted emotional journey can positively affect and inform exhibit planning.

Today, both the Aquarium Framework Plan and the emotional mapping project at the National Aquarium are still in development. And both projects are informing and advancing each other.

Working together, our teams identified several key emotions and then broke them apart to discover two additional variables: connections and triggers. "Connections" are defined from the guest's perspective, where we want them to connect with the aquarium's story, animals, staff, and each other. In some moments, a "trigger" may be needed to help make a connection. Triggers could be a characteristic of the animal, habitat, or story – such as surprise, funny, scary, beautiful, weird, odd, gross, cool, playful – or the defined architectural space – big, open, sunlit, dark, eerie, or majestic. By identifying or placing proposed triggers onto the current architectural plan, we are beginning to choreograph the emotional journey and define how to transform existing spaces into unique galleries that will influence positive emotions to advance the narrative and mission.

We accept that emotions are complex. At times, they can be challenging to describe, define, or articulate. Multiple emotions can also coexist simultaneously. Therefore, we no longer think of them singularly. Instead, we consider how one emotion might



complement another, or how they might pull the visitor further into the narrative or to the next exhibit (fig. 5).

Lastly, we acknowledge that emotions are ephemeral, and guest experiences will change. So, how do we envision and plan spaces that foster empathy for tomorrow's audiences? Like the Aquarium Framework Plan, emotional mapping is a methodology and practice applied to the process as priorities, audiences, relevance, and interests change over time. It will evolve as new research and bold projects are completed. Therefore, the emotional map and its impact on design and interpretation is dynamic and should not be seen only as a prescribed set of emotions, connections, and triggers.

Together, we are still trying to understand it. In fact, we are still trying to figure out what

"it" is. But we continue to learn, explore, and try because we truly believe that furthering our understanding of thoughtfully planned and designed exhibits will foster emotional connections, empathy, and conservation actions. ■

1 Pablo P. L. Tinio, "The Secrets of Emotion," *Museum* (July/August 2021), www.aam-us.org/2021/07/01/the-secrets-of-emotion/.

2 Mary Helen Immordino-Yang, *Emotions, Learning, and the Brain: Exploring the Educational Implications of Affective Neuroscience* (New York, New York: W. W. Norton & Company, Inc.), 2016.

3 Ibid.

4 Susanne Vogel and Lars Schwabe, "Learning and memory under stress: implications for the classroom," *npj Science of Learning* 1, no. 16011 (2016), <https://doi.org/10.1038/npjscilearn.2016.11>.

5 An American Civil War Museum 2019 exit survey data showed that 83 percent of visitors agreed with the statement, "I made connections between the history and the current day." Visitor responses to the questions "What are we doing well? What was good about your visit?" included "human story, emotional understanding of the cost of the war," and "parallels in why the country is internally divided today."