Introducing:

An Intro Label Everyone Can Stand By

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Abstract

Most exhibitions are contained within a defined built environment such as a building or park. Usually, there is some form of entrance to these spaces. These entrances often use text to orient visitors to some combination of: the content presented in the space, the physical layout of the space, and the activities or learning opportunities one might engage with in the space. Other purposes for text at exhibition entrances include: introducing the mission of the institution/organization that owns the space, presenting funders of the exhibition, warning visitors of sensitive content, and so on.

Studies have shown that many visitors, if not most, do not read introductory texts to exhibitions. Studies also show that visitors who do read introductory texts learn more in the exhibition and have a better overall experience. Professionals in the museum field share a goal to create introductory texts that attract visitors and communicate the "Big Idea" underlying the exhibition. At the same time, they describe challenges in attracting visitors to introductory texts, and in summarizing Big Ideas and other key exhibition concepts. Professionals report a lack of time, funding, and/or institutional support for prototyping this element ahead of final installation, despite its perceived importance.

While there is an abundance of literature about best practices in label-writing, and about how labels impact visitors' learning and experiences, there is significantly less written about best practices for creating and displaying introductory texts specifically. Perhaps as a result of this gap in dialogue and literature, introductory texts have been displayed in a standard format—paragraphs of text on a wall—for decades at many institutions, despite technological advances that allow for new methods of displaying text and despite advances in museology that indicate the need to interpret content in a diversity of modes to serve a broader visitor base. Because engaging with introductory text is known to significantly improve the visitor experience, it is time to understand the purpose for stagnant practices and to expand perspectives about this critical component of the exhibition planning and design process. The purpose of this study is

to help understand successful approaches to, and challenges in, creating and displaying introductory texts across a diversity of institutions, and to use that data to prototype design solutions at the Saint Louis Science Center. Data was collected through interviews with professionals in the field who are recognized for implementing successful strategies, interviews with storytellers from other fields, and a survey filled out by visitor researcher/evaluators.

Findings included the importance of conducting front-end research to gain a sense of visitor expectations and motivations upon entering an exhibit; the need to engage visitors on a personal level; the success achieved by many interviewed professionals who have written and designed for "walk-by" engagement—in which visitors don't necessarily have to stop to read; the criticality of integrating text with objects and/or non-text media as a means of capturing and holding attention; and the importance (and rarity) of prototyping solutions to determine the best placement, reading level, design strategies, etc. for the text. Further research in this area might include a more thorough investigation into design strategies for introductory text; a survey of emerging technologies (especially more affordable ones) that could be useful for displaying introductory text; and additional investigation into how teams resolve conflicts between content experts and "visitor advocates" when drafting introductory text and design.

Standard "three paragraphs on a wall" format
at the Metropolitan Museum of Art, NYC

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Chapter 1: Introduction

Many visitors don't read the introductory text. But research shows that when they do, they learn more and have a more meaningful experience.[1]

Attention spans in the United States are short, and shrinking.[2] Introductory texts to exhibitions tend to be long. Whereas leading experts in the field recommend that introductory texts remain within a 50 to 100-word count,[3] the author read a random sampling of ten introductory texts during the summer of 2018 and found the average word count to be 168. Beverly Serrell says that "many studies have documented the low use of introductory panels and the positive impact on visitor behavior and outcomes when people did use the introductory information."[4] Despite exhibit professionals' concurrence that introductory texts are critical components of the visitor experience, there is a dearth of literature about best practices in creating introductory texts.

This study seeks to help exhibitions teams create introductory texts that attract, engage and orient visitors as they enter an exhibition.

This will be achieved in part through a synthesis of literature related to the common goals and challenges described above; in part through interviews with exhibit developers and storytellers in other fields; through data collected from a survey given to visitor researchers/evaluators; and through evaluating the effectiveness of a series of prototypes at the Saint Louis Science Center (SLSC) and recommending strategies for final production.

Applying this research to exhibits about science

This research is not limited to one specific museum discipline. It synthesizes methods and best practices from a diversity of institutions and professionals in the field. However, findings from

[1] Beverly Serrell, *Exhibit Labels: An Interpretive Approach*, 2nd ed. (Rowman & Littlefield, 2015), 34.
[2] Kevin McSpadden, "You Now Have a Shorter Attention Span Than a Goldfish," *Time* (2015).
[3] Judy Rand, interviewed by the author, June 20, 2018.
[4] Beverly Serrell, "Paying More Attention To Paying Attention," Informalscience.org (2010): 4.

this research were applied to a prototyping session of introductory text at the Saint Louis Science Center, and this researcher began a position at the Science Center as STEM Content Developer at the time of this writing. Therefore this study includes suggestions for interpreting scientific content specifically.

Interpreting scientific content presents unique challenges. Scientists' writing often does not convey stories in a way that is engaging or easy for laypeople to understand, in large part because (at the time of this writing) they haven't traditionally been trained to do so. Scientific terminology is founded on complex Latin-based words with very specific meanings (i.e. *anthropogenic*), that are not rooted in most visitors' daily experiences. It is challenging to interpret scientific concepts with the accuracy desired by content experts and the brevity necessary to engage a general audience. This challenge is compounded by the "long-standing communication gap between scientists and the general public."[5] Experts say that the public is increasingly skeptical about science, especially when it conflicts with core human values, religious and political beliefs, or economic expediency.[6] To foster a society of science-literate citizens who are informed in critical issues like climate change, informal science educators are tasked with bridging this communication gap.

Ideally, this study's synthesis of a range of methods for writing and displaying introductory text will be broadly applicable but will hold particular relevance for the Saint Louis Science Center and other science-based institutions.

THESIS STATEMENT

Exhibition teams can write and display introductory texts that attract, engage, and orient more visitors by implementing elements of storytelling, engaging visitors on a personal level, planning for 'walk-by' engagement, and collaborating across the institution to prototype and evaluate solutions.

[5] Anne E. Greene, *Writing Science in Plain English* (Chicago: University of Chicago Press, 2013), 13, 29, 2.
[6] Nancy Baron, *Escape from the Ivory Tower: A Guide to Making Your Science Matter* (Island Press, 2010), 279.

A note on the meaning of "display"

This study acknowledges that the physical context in which exhibition text is displayed is a critical factor of how the text is received. As Stephen Bitgood notes, "Some may argue that visitors are capable of extracting whatever meaning they want from an exhibition relatively independent of exhibition design factors. Others argue that setting factors play the primary role in paying attention."[7] Bitgood maintains that "an understanding both of person and setting, as well as their interaction, is necessary to truly understand visitor attention." For the purpose of this study, the *display* of introductory text can be defined in terms of all design strategies used to create a "setting" for introductory text (referred to as a "threshold" in many institutions), as well as the strategies used to present the text itself. Aspects of display may include:

- Typography
- Color
- Images used
- Various media combined with introductory text, such as video and audio
- Material choices
- Proximity to or incorporation of an object/objects
- Lighting design
- Any other visual or sensory components that draw attention to or supplement the text itself

This study considers successful means of leveraging all of these forms of display to attract and engage visitors in ***reading the text itself***.

Initial inquiry

Research for this study began by conducting **three-question e-mail interviews with a dozen exhibition professionals to understand common challenges and goals** in creating introductory texts. These are outlined in Appendix A. The results indicate that exhibit teams aspire to **attract visitors** to introductory texts in the first place, and they find this to be one of the greatest

[7] Stephen Bitgood, *Attention and Value.* (New York: Routledge, 2013), 10.

challenges in writing and displaying the text. Teams seek to communicate the **"Big Idea"** behind an exhibition, and they describe the challenge of conveying this concept and related themes concisely. Teams also want their introductory texts to give visitors a sense of **what they're about to learn, see and do.** Serrell (who was one of the respondents) says "visitors who understand the organization of the exhibition and use it in the intended sequence spend more time and get more out of it."[89]

Respondents to this researcher's three-question interview also predict some changes in the ways introductory texts are created and used over the coming years: increased implementation of **non-text media** might serve to attract and engage more audiences; there may be more attention given to how the text itself fits within the **overall threshold**; and there will ideally be **more collaboration** across the team and between departments in creating and prototyping introductory texts. One last challenge that is sometimes described, and seems worth mentioning, is the **conflict** that arises between curators or content experts and exhibition teams in regard to reading level, word count, and the like.

The literature review below, and the questions asked in the more in-depth interviews with museum professionals conducted for this study, were designed based on the above findings from the initial three-question interviews conducted via e-mail over the summer of 2018.

[8] Valerie Crane et al., *Informal Science Learning: What the Research Says about Television, Science, Museums, and Community-Based Projects*. (Dedham, MA: Research Communications Ltd., 1994)
[9] Stephen Bitgood, "Special Issue: Orientation and Circulation." *Visitor Behavior 1*, no. 4 (1987)

Chapter 2: Literature Review

1. Getting People's Attention

1a. ATTENTION AND VALUE

A nuanced view of why many visitors don't currently use introductory texts requires a basic understanding of the psychology of attention, both in direct relation to museum visitors and in broader terms. Beverly Serrell says, "In shopping malls, the currency is money: Spending it enables a purchase. **In museums, the currency is attention**, and paying attention—which requires spending time—is a prerequisite for comprehension."[10] Stephen Bitgood also writes about the cost of paying attention, saying that "The primary motivation for paying attention is perceived value (utility or benefit divided by cost)." In the context of a museum, Bitgood notes that this equation "combines **personal and psychological factors** (e.g., interest level in exhibit content, agenda for a particular museum visit…, state of energy level) with **environmental or setting variables** (e.g., social influence, architectural design) to predict what and how much attention will be given to exhibit elements." John Falk similarly cites environmental and setting variables as critical factors in the museum visitor experience overall, which he says "is neither about visitors nor about museum exhibitions and programs; it is about the dynamic interaction of these as they briefly come together in space and time."[11]

To summarize these museum theorists' findings, museum visitors' attention is influenced by their own motivations and psychological states, as well as by external ("environmental") factors like excited children or bottleneck traffic. It is possible that these factors are more numerous and in an increased state of flux at the exhibit threshold, where visitors' expectations and motivations are perhaps heightened, and as those personal factors merge with a new set of environmental factors. Beverly Serrell notes that research on people's shopping behavior in malls has revealed that "**people need to adjust and 'decompress' in the first 12 to 25 feet** inside the door of a store."[12] If museum visitors feel similarly disoriented upon entering an

[10] Beverly Serrell, *Paying Attention,* 9.
[11] Stephen Bitgood, *Attention and Value*, 12-13.
[12] Beverly Serrell, *Paying Attention,* 9.

exhibition, then it is possible that the benefit of engaging with introductory text, divided by the costs involved, does not easily outweigh the perceived benefits of other exhibit elements. Additionally, as was revealed through many of the interviews synthesized in this study, visitors often do not notice introductory text at all.

1b. SURPRISE, INTEREST, AND MAKING & BREAKING PATTERNS

So how can exhibition teams attract attention to introductory text and increase perceived benefits of spending time with it? According to Chip and Dan Heath, "We can't succeed if our messages don't **break through the clutter** to *get* people's attention. Furthermore, our messages are usually complex enough that we won't succeed if we can't *keep* people's attention." (The idea of "keeping people engaged" is addressed in the next area of literature.) Heath and Heath continue, "to understand the answers to these two questions, we have to understand two essential emotions—**surprise and interest**—that are commonly provoked by naturally sticky* ideas."[13] They assert:

> The most basic way to get someone's attention is this: **Break a pattern.** Humans adapt incredibly quickly to consistent patterns. Consistent sensory stimulation makes use tune out: Think of the hum of an air conditioner, or traffic noise, or the smell of a candle, or the sight of a bookshelf. We may become consciously aware of these things only when something changes: The air conditioner shuts off. Your spouse rearranges the books.… Our brain is designed to be keenly aware of changes. Smart product designers are well aware of this tendency. They make sure that, when products require users to pay attention, something *changes.* Warning lights blink on and off because we would tune out a light that was constantly on.[14]

[13] Chip and Dan Heath, *Made to Stick: Why Some Ideas Survive and Others Die* (New York: Random House, 2008), 64-65.
[14] Ibid.

1b A sign gives context for the Exploratorium's outdoor installation *Sound Commons*, which features noisemaking devices amongst a series of platforms. Science Writer Eileen Campbell, who works on this project, says "people are more *surprised* [by something like this] outside, so they're more likely to read to try to find out what they're looking at."

Narratologist Lisa Kron cites the Heaths' concept of pattern-breaking as the best way to command attention, adding that "in order to break a pattern, we need to know what the pattern is." For novel-readers, Kron says "EVERYTHING is part of a pattern," and everything is "either a setup, a payoff, or the road in between." She explains that "your brain is constantly charting the patterns around us, always with the same agenda: what's safe, and what had I better keep my eye on?"[15] We're "hardwired" to expect a newly established pattern to be a

[15] Lisa Kron, *Wired for Story* (Berkeley: Ten Speed Press, 2012), 10.

setup with a corresponding payoff: Kron says, "**Setups seduce us with the granddaddy of all sensations: engagement.** We know from the instant we spot one that it's now our job to feverishly track the pattern leading to the payoff; we tackle it with abandon, relishing every moment, even when it keeps us reading long past our bedtime." Finally, Kron adds that "Setups, when done well, read like fate. What they often do is illuminate a possibility. The reader always has the sense that it might go either way. What keeps us reading is the building desire to find out."[16]

Neuroscience writer Jonah Lehrer agrees with the idea that "nothing focuses the mind like surprise," and Kron adds that "we crave the notion that we've come in at a crucial juncture in someone's life, and not a moment too soon." Kron describes how novelists can **hook readers with an element of surprise at the beginning** of a work of fiction, by introducing the story at a moment when the protagonist's world-view or typical patterns of thinking have been displaced. She says "stories often begin at just the moment when one of the protagonist's long-held beliefs is about to be called into question" and she advises that "**the best place to start a story is by pinpointing the moment long before, when the protagonist first fell prey to the inner issue that's been skewing her worldview ever since.**" Kron goes on to explain the goal of a novelist, which she says is to make the reader *feel* like they know the protagonist, "and—this is essential—care enough about [the protagonist] to want to find out what will happen to her. Which means **we've also got to establish two things--that big changes are coming and all is not as it seems**--and we have to do it as quickly as possible."[17]

Elaborating on how surprise affects us, Heath and Heath say "**Surprise makes us want to find an answer**—to resolve the question of why we were surprised—and big surprises call for big answers. If we want to motivate people to pay attention, we should seize the power of big surprises."[18] Heath and Heath outline specific methods of surprising audiences. Whereas Kron

[16] Lisa Kron, *Wired for Story*, 191.
[17] Ibid., 12, 87.
[18] Ibid., 69.

advises novelists to begin their stories at a time when the *protagonist's* world-view has been broken, Heath and Heath suggest that other communicators can **violate the schema of the audience**. A schema can be defined as "a cognitive framework or concept that helps organize and interpret information"—in other words, an assumption or perception of what something is or how something functions. Kendra Cherry, MS says that "schemas can be useful because they allow us to take shortcuts in interpreting the vast amount of information that is available in our environment."[19] Heath and Heath provide an example: in order to explain to someone what a pomelo fruit is, one might describe it as a "supersized grapefruit."[20] This description leverages most people's existing schema, or concept, of what a grapefruit is, and expands upon it by adding another simple layer of information.

Cherry notes that schemas also "cause us to exclude pertinent information to focus instead only on things that confirm our pre-existing beliefs and ideas,"[21] making it difficult to accept information that differs from our world-view. Heath and Heath suggest leveraging people's schemas by playing into them, then adding an element of surprise. They describe an advertisement that begins like a typical car commercial, but suddenly the ad takes a turn and the car crashes, revealing the advertisers' true intentions to convince viewers to buckle up. This ad "violates our schema of real-life neighborhood trips," most of which end safely. They say, "Our schemas are like guessing machines. Schemas help us predict what will happen and, consequently, how we should make decisions." In this case "our guessing machines failed, which caused us to be surprised."[22] Creating surprise is one way to hook visitors in so that they will want to stay engaged. "**Unexpected ideas, by opening a knowledge gap, tease and flirt.** They mark a big red X on something that needs to be discovered but don't necessarily tell you how to get there."[23]

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[19] Kendra Cherry, "The Role of a Schema in Psychology," *VeryWell Mind.* https://www.verywellmind.com/what-is-a-schema-2795873
[20] Heath and Heath, *Made to Stick*, 56.
[21] Kendra Cherry, "The Role of a Schema in Psychology." *VeryWell Mind.* https://www.verywellmind.com/what-is-a-schema-2795873
[22] Heath and Heath, *Made to Stick*, 67.
[23] Ibid., 93.

A Storyteller's Story

Pete Griffin is a park ranger and storyteller living in Alaska who loves to violate schemas. "Sometimes I will start a story with an outrageous quote or a statement that'll make people scratch their heads. I'll say, '*I've been out in the woods for over 60 years, hunting and fishing, and during that whole time I've never seen an elf.*' And people will say, 'Elves? what about elves?' And then I tell a story about a plant that at one point was introduced to protect cows against elf arrows and people against witches' spells. Outrageous statements like that draw people in."[24]

[24] Pete Griffin, interviewed by the author, January 14, 2019.

1c. SELF INTEREST & GROUP INTEREST

Another method of getting people's attention is to **appeal to self-interest.** Heath and Heath write, "What matters to people? People matter to themselves. It will come as no surprise that one reliable way of making people care is by invoking self-interest." They go on to describe renowned copywriter John Caples's approach to this. Caples advises, "First and foremost, **try to get self-interest into every headline you write.** Make your headline suggest to readers that here is something they want. This rule is so fundamental that it would seem obvious. Yet the rule is violated every day by scores of writers." Caples's headlines promise great personal benefits at low cost:

- *You can laugh at money worries if you follow this simple plan*
- *The secret of how to be taller*
- *How you can improve your memory in one evening*

Caples says, "The most frequent reason for unsuccessful advertising is advertisers who are so full of their own accomplishments (the world's best seed!) That they forget to tell us why *we* should buy (the world's best lawn!)." He advises spelling out "the benefit of the benefit." Caples also recommends **keeping the "self" in "self-interest."** Instead of 'People will enjoy a sense of security when they use Goodyear Tires.' Caples suggests '*You* enjoy a sense of security when you use Goodyear Tires.' TV producer Jerry Weissman also says that the WIIFY—"what's in it for you"—should be central to every motivational speech.[25]

Heath and Heath expand upon the importance of appealing to self-interest, explaining that "'**Group interest**' is often a better predictor of political opinions than self-interest"—in other words, people tend to make political decisions based on the larger interests or values of the political groups they identify with. When people form opinions they seem to ask not "What's in it for me?" but, rather, "**What's in it for my group?**" Heath and Heath say, "Our group

[25] Heath and Heath, *Made to Stick*, 177-181.

affiliation may be based on race, class, religion, gender, region, political party, industry, or countless other dimensions of difference."[26]

The human tendency to affiliate with group interests impacts attention capture and sharing online. By 2015, the news platform BuzzFeed had become 'the gold standard…for attention capture on the web."[27] This success was achieved due to research by BuzzFeed CEO Jonah Peretti and others into "the necessity of stimulating '**pleasure in the social process of passing**' **something along** and of ensuring that the contagion 'represent[s] the simplest form of an idea.'"[28] In keeping with Heath and Heaths' findings about engaging individuals and groups through surprise and violated schemas, the urge to share online content was found to be activated by "**a spectrum of 'high-arousal' emotions**, like awe, outrage, and anxiety." Headlines like the following trigger such emotions:

- *When All Else Fails, Blaming the Patient Often Comes Next*
- *Rare Treatment is Reported to Cure AIDS Patient*

An individual who is surprised by these stories might be likely to share them with the social group they identify with—those who might also be surprised—such as patients who have been blamed by doctors, or those who are personally invested in AIDS research.[29]

Exhibit teams can put this into practice by:

- Writing and displaying introductory texts in a way that violates visitors' schemas, whether that means re-designing a familiar space in the museum to surprise longtime members or writing bold headings that contrast with visitors' beliefs.
- An institution that understands its visitors' motivations and identities can experiment with writing and designing directly for those audiences, weaving in elements of surprise and interest based on visitors' existing schemas.

[26] Ibid., 190.
[27] Tim Wu, *The Attention Merchants: The Epic Scramble to Get Inside Our Heads* (New York: Alfred A. Knopf, 2016), 321.
[28] Peretti, Jonah. "Notes on Contagious Media." *Structures of Participation in a Digital World,* ed. Joe Karaganis (New York: Social Science Research Council, 2007), 160.
[29] Wu, Tim. *The Attention Merchants*, 320.

2. Keeping People Engaged

Once an introductory text has captured a visitor's attention, the next step is to keep the reader engaged long enough to recognize key concepts and anticipate key experiences. Chip and Dan Heath say that "[communicators'] messages are usually complex enough that we won't succeed if we can't *keep* people's attention.[30] The study of engagement has been a significant focus of museum theorists, psychologists, educators, advertisers, and producers of various media including novels. The literature review below outlines some of these theorists' models for stages of engagement; the correlation between engagement and time spent with an exhibit element; and engaging by sustaining interest through the use of mystery, curiosity gaps, strategic sequencing, and concrete examples.

2a. MODELS OF ENGAGEMENT

Stephen Bitgood describes museum visitor attention as taking place along a three-stage continuum involving "**capture, focus, and engagement**." Bitgood argues for a "holistic view of visitor attention" rather than "focusing on a single state (engagement) as many viewpoints do." He claims that "managing attention requires addressing all three stages and recognizing that each stage is influenced by a different set of factors, different mechanisms or processes, and a different set of outcome measures or indicators." He goes on to describe this continuum's place within a four-part definition of visitor attention, with visitor attention being a group of psychological processes…

> **(1)** That involve a 3-stage continuum (capture, focus, and engagement);
> **(2)** In which each stage is sensitive to a unique combination of variables;
> **(3)** In which actions from these processes are motivated by the interaction of **person factors** (personal value, interest, past experiences; perceptual, cognitive, affective, decision-making processes) and **setting factors** (social influence, architectural and exhibit design);
> **(4)** That are measured by multiple indicators or dependent variables (approaching an object, stopping, viewing time, reading, talking with others about, thinking about, tests

[30] Heath and Heath, *Made to Stick*, 16.

> of learning and memory, rating scales, etc.) with different outcome responses (indicators) at each stage.[31]

Bitgood characterizes each stage within the 3-stage continuum by a different set of actions and indicators.

> Capture stage actions:
>
> - looking at something
> - approaching it
> - stopping
>
> Focus stage actions:
>
> - a narrowing of attention to a single exhibit element to the exclusion of others
>
> Engagement stage actions:
>
> - highly focused examination of the exhibit content
> - reading text
> - discussing thinking about implications of the material[32]

Chip and Dan Heath suggest a general process for capturing attention and then keeping an audience engaged. Step 2 correlates with Bitgood's "capture" stage, and step 3 is method of facilitating Bitgood's steps 2 and 3, or "focus and engagement."

> (1) Identify the central message you need to communicate—find the core;
> (2) Figure out what is counterintuitive about the message—i.e., What are the unexpected implications of your core message? Why isn't it already happening naturally?
> (3) Communicate your message in a way that breaks your audience's guessing machines along the critical, counterintuitive dimension. Then, once their guessing machines have failed, help them refine their machines.[33]

In her book "Wired for Story," Lisa Kron similarly illuminates the importance of establishing a combination of context and conflict or surprise. Kron names the "three basic things readers

[31] Ibid., 13-17.
[32] Stephen Bitgood, *Attention and Value*, 17.
[33] Heath and Heath, *Made to Stick*, 72.

hunt for as they read the first page [of a book]" after being initially hooked by the title, first sentence, and so on:

> (1) Whose story is it? To feel what the protagonist is feeling, we should **meet them in the first paragraph.**
> (2) What's happening here? Something must be **happening—beginning on the first page**—that the protagonist is affected by. Something that gives us a glimpse of the 'big picture.' As John Irving once said, "Whenever possible, tell the whole story of the novel in the first sentence."
> (3) What's at stake? Conflict is story's lifeblood. There needs to be conflict that is specific to the protagonist's quest. **Something must be at stake, beginning on the first page.**[34]

Kron cites the opening of Elizabeth George's *What Came Before He Shot Her* as an example of how steps 1-3 can be addressed in one sentence. The novel begins: "Joel Campbell, eleven years old at the time, began his descent into murder with a bus ride." Kron explains that "without that sentence, things would happen in the story, but we'd have no real idea what they were building toward." On the importance of setting up context, neuropsychiatrist Richard Restak says "within the brain, things are always evaluated within a specific context." Kron clarifies, "**It is context that bestows meaning, and it is meaning that your brain is wired to sniff out.**"[35]

2b. ENGAGEMENT AND TIME

In regard to how long a museum visitor may need to stay engaged in any situation, Beverly Serrell says "Time by itself is not important. It is an indicator. In general, visitors who engage in learning-related behaviors, such as reading [and] interacting with exhibits and each other...spend more time." It is also important to note that exhibit teams who have a sense of how long visitors are likely to spend in any given gallery or area can write and design accordingly. Serrell says, "Knowing the amount of time visitors are likely to spend can help exhibit planners design museum experiences that are **manageable for realistic visitor time**

[34] Lisa Kron, *Wired for Story*, 16.
[35] Ibid., 19.

budgets. Exhibit developers can strive for a better-than-average percentage of stops by making more of the elements appealing to a greater number of visitors."[36]

2c. ENGAGING BY SUSTAINING INTEREST

Heath and Heath say that while surprise gets people's attention, it is interest that keeps their attention. They say, "there are classes of sticky ideas that maintain our interest over time. Conspiracy theories keep people ravenously collecting new information. Gossip keeps us coming back to our friends for developments."[37] They also describe ways to keep people's interest through the use of mystery, by establishing what's known as the "curiosity gap," and through strategic sequencing of content. Several of the related case studies Heath and Heath compiled are described below.

Sustaining interest with mystery

Heath and Heath write that **teaching using mysteries** is one way to keep an audience's "guessing machines" working. They cite the work of psychologist Robert Cialdini, who "believes that a major benefit of teaching using mysteries is that 'the process of resolving mysteries is remarkably similar to the process of science.'" Heath and Heath explain that "by using mysteries, teachers don't just heighten students' interest in the day's material; they train them to think like scientists."[38]

Whereas a schema violation has a quick impact, Heath and Heath say that teaching through mystery has a "more extended and subtle" effect. As an example, they offer: "We are told that scientists do not know what Saturn's rings are made of, and we're asked to follow on a journey whose ending is unpredictable. That's second-level unexpectedness. In this way, we jump **from fleeting surprise to enduring interest**." In another example, Heath and Heath suggest how "A chemistry teacher might lead into the periodic table of elements by discussing Mendeleyev

[36] Beverly Serrell, *Paying Attention,* 7, 50.
[37] Heath and Heath, *Made to Stick*, 64-65.
[38] Ibid., 82.

and his long, passionate quest to organize the elements. In this way, the periodic table emerges from within the context of a sort of detective story."[39]

Sustaining interest through curiosity gaps

George Loewenstein, a behavioral economist at Carnegie Mellon, says that curiosity happens "when we feel a gap in our knowledge." Loewenstein argues that gaps cause pain. "When we want to know something but don't, it's like having an itch that we need to scratch. To take away the pain, we need to fill the knowledge gap. We sit patiently through bad movies, even though they may be painful to watch, because it's too painful not to know how they end." Heath and Heath clarify how curiosity gaps fall in to different aspects of media and culture: "Movies cause us to ask, *what will happen?* Mystery novels cause us to ask, *who did it?* Sports contests cause us to ask, *who will win?* Crossword puzzles cause us to ask, *what is a six-letter word for 'psychiatrist"?* They explain that communicators must **open gaps before closing them**—making the audience realize they need the facts—rather than immediately giving away the facts. According to Loewenstein, the trick to convincing an audience that they need to fill a gap is to "first highlight some specific knowledge that they're missing. We can pose a question or puzzle that confronts people with a gap in their knowledge. We can point out that someone else knows something they don't. We can present them with situations that have unknown resolutions, such as elections, sports events, or mysteries. We can **challenge them to predict an outcome** (which creates two knowledge gaps—*What will happen?* And *Was I right?*"[40]

News teasers often incorporate curiosity gaps with headlines such as "There's a new drug sweeping the teenage community--and it may be in your own medicine cabinet!" or "There's an invisible chemical in your home--and it may be killing you right now!" Heath and Heath say these are "**sensationalist examples of the gap theory**" that work because they "tease you with something that you don't know—in fact, something that you didn't care about at all, until you found out that you didn't know it." Instead of asking what information they need to convey,

[39] Ibid., 82, 92.
[40] Ibid., 84-85.

Heath and Heath say communicators should consider the questions they want their audience to ask.[41]

Heath and Heath note that "Some topics naturally highlight gaps in our knowledge." They cite **human-interest stories** as examples, because "we know what it's like to be human—but we don't know what it's like to have certain dramatic experiences. **How does it feel** to win an Olympic medal? How does it feel to win the Lotto?"[42]

[41] Heath and Heath, *Made to Stick*, 85, 88.
[42] Ibid., 90.

A Storyteller's Story

Mika Chance is a writer/producer at Cheddar, a financial online news source for Millennials. She always uses curiosity gaps to hook visitors. "We're competing against everything else that might be in your Youtube recommended list, so when you click in we want to create a gap between what you know about this subject and what I'm telling you there is to know—i.e., "*Lemons gave rise to the Sicilian mafia? Whaaat?*" Once you click, we provide a "road map" saying "this is a video about *x*, and we're going to talk about *xyz*. Then you ask, 'Is this what I wanted? Is it worth staying?' And the big thing for me as the writer is, am I living up to the promise I made in the headline? So the formula is: set the stage, drop the knowledge bomb, and then wrap it up and make it come down and contextualize it; put a bow on it.[43]

[43] Mika Chance, interviewed by the author, December 14, 2018.

A Storyteller's Story

Fran Stallings is a science writer/storyteller who believes in the power of scientists acting as the characters in stories about their research. "When a scientist tells an audience why they personally care about a topic, that is very effective in getting non-scientists to see what scientists do. If you have to give a 30-min talk to the Rotary club, you engage their interest on a human level by talking about YOU - why you care, what happens to the fish in the water you're researching, stuff like that. So the hook, in that case, is making a human connection by saying why an individual—the one the audience is listening to—is interested."[44]

[44] Fran Stallings, interviewed by the author, February 3, 2019.

In situations where the curiosity gap is very large—meaning, the audience knows or cares very little about a topic—communicators must "**fill in enough knowledge to make the abyss into a gap**." Heath and Heath give the example of a reporter covering a little-known football team. He engaged new audiences by setting the scene: before the game started, he filmed the building excitement. Portraying local fans' excitement and highlighting emotions and rivalries got first-time viewers invested. Heath and Heath say that many teachers use some version of this reporter's strategy to prime their students' interest when the students might know very little about a topic (in other words, the "gap" between what is and isn't known is very broad.) Teachers often call this strategy "**advanced organizers**." They know that engaging students in a new topic requires them to start by highlighting some things they already know. For example, Heath and Heath say "An earth-science teacher might ask her students to bring in pictures of an earthquake's devastation, as a way of leading up to a discussion of plate tectonics."[45]

Sustaining interest through strategic sequencing

Author Robert McKee believes that in a great script, every scene should be a **Turning Point**. He says, "Each Turning Point hooks curiosity. The audience wonders, *What will happen next?* and *How will it turn out?* The answer to this will not arrive until the climax of the last act, and so the audience, held by curiosity, stays put." Heath and Heath add that communicators can "**set context so people care what comes next**." They say "There is value in *sequencing* information—not dumping a stack of information on someone at once but dropping a clue, then another clue, then another. This method of communication **resembles flirting more than lecturing**."[46]

Narratologist Lisa Kron provides an outline for how novelists can think about sequencing by creating a series of causes and effects. She says that every scene must do the following:

- In some way be caused by the 'decision' made in the scene preceding
- Move the story forward via the characters' reaction to what is happening
- Make the scene that follows it inevitable

[45] Heath and Heath, *Made to Stick*, 45, 248, 92.
[46] Ibid., 83, 93.

- Provide insight into the characters that enables us to grasp the motive behind their actions

Kron also notes that a writer can gauge whether a scene is a logical part of the cause and effect chain by asking:

- Does this scene impart a crucial piece of info, without which some future scene won't make sense?
- Does it have a clear cause the reader can see (even if the 'real reason' it happened will be revealed later)?
- Does it provide insight into why the characters acted as they did?
- Does it raise the reader's expectation of specific, imminent action?[47]

Sustaining interest with concrete examples

Heath and Heath list concreteness as one of the key elements of a message that sticks. They say that "concrete language helps people, especially novices, understand new concepts." They describe something as concrete "if you can examine [it] with your senses…. A V8 engine is concrete. 'High performance' is abstract. Most of the time, concreteness boils down to specific people doing specific things."[48] Beverly Serrell lists concreteness as part of the "10 Commandments" of label-writing, saying that "labels should begin with concrete, visual references to the objects they interpret to bring them to life."[49] As an example, Serrell cites a label with the following text, "from a history museum, as a photo caption in an exhibition about logging:"[50]

[47] Lisa Kron, *Wired for Story*, 162.
[48] Ibid.
[49] Beverly Serrell, *Exhibit Labels,* 2.
[50] Heath and Heath, *Made to Stick*, 91, 104.

The logger needed clothes that were functional and provided freedom of movement. Pants were cut off just below the boot tops to keep the rain out and to prevent snagging. Men working in the woods often had to take off at top speed, and if a pant leg caught it could mean the difference between life and death.

Serrell explains that "readers can **imagine action** in their minds and memories, aided by the label's concrete references. You may not…witness the logger running for his life, but [stories like this] give visitors a 'minds-on' moment." She adds that writers should "start with visual, concrete information—what visitors can see…. **Work from the specific to the general**, not the other way around."[51]

Kron agrees that "the whole point of a story is to translate the general into a specific" so that if we encounter an analogous specific example in our own lives we'll be prepared for how to react. At the same time, Kron notes that "like everything else in a story, details and **specifics need a STORY REASON** to be there." She says this is particularly the case with sensory details. Kron notes that vivid details boost a story's credibility, but "they must be meaningful—that is, they need to symbolize and support the story's core idea."[52]

[51] Beverly Serrell, *Exhibit Labels,* 24, 36.
[52] Lisa Kron, *Wired for Story*, 103, 118, 162.

Kron provides **3 main reasons for any sensory detail** to be in a story:

(1) It's part of a **cause-and-effect** trajectory that relates to the plot—Lucy drinks a milkshake; she passes out.
(2) It gives us **insight** into the character—Lucy [drinks the milkshake because she's] an unapologetic hedonist headed for trouble.
(3) It's a **metaphor**—Lucy's [milkshake] flavor choice represents how she sees the world.

Kron adds that "**the reader must be AWARE of the story reason for each detail's presence**.[53]

Exhibit teams can put this into practice by:

- Considering how to provide the right amount of context, conflict, and/or surprise from the beginning of an exhibit narrative.
- Writing and designing with a holistic view of the many "person factors" and "setting factors" (described by Bitgood, above) at play when visitors enter the exhibit.
- Developing a clear understanding of visitor motivations and the amount of time visitors are likely to spend in an introductory area.
- Engaging visitors in scientific content by establishing a quest to solve a mystery, and by employing human-interest stories like astronauts' or deep-sea divers'.
- Combining objects, images, and/or other media with introductory text to create concrete sensory detail that gives poignancy to the exhibit narrative, brings characters to life, and illustrates the Big Idea.

[53] Ibid., 120.

3. Design that Attracts and Engages

The design and display of introductory text play a critical role in visitors' engagement with the text. Museum theorist Sharon MacDonald says "design is…an integral part of the visitor experience, with potentially more far-reaching implications for structuring the very nature of that experience rather than simply providing a more or less attractive medium for presenting content."[54] While there are more variables in designing and displaying exhibit text for specific sites than this study can account for, the following is a basic overview of best practices in some of the easiest-to-apply aspects of text design. This includes a review of what makes text **scannable** and easy to take in, drawing from the field of information architecture and specific models of label-writing; **combining text with objects and images**; and **designing for easy orientation**.

3a. SCANNABILITY

Best practices in the field of information architecture can inform exhibit teams' design of introductory texts. Research in this field is relevant to this study because of its emphasis on designing for quick scanning of text. Information architects also often build methods of **measuring effectiveness** of their design into their online content. As Carol Bossert asks in her essay "Labels Unleashed: Breaking the Tyranny of Information," "what if we borrowed the conversion rate metric from web developers to measure the effectiveness of a label?"[55]

The Information Architecture Institute defines information architecture as "the practice of deciding how to arrange the parts of something to be understandable."[56] "Scannability" is one area of study within this field. Though the term is most commonly applied to online texts, the goals of designing for quick online reading are similar to the goals for designing quickly digestible introductory texts. According to Devan Goldstein, a strategy and user experience

[54] Macdonald, S. "Interconnecting: Museum Visiting and Exhibition Design", (2013): 149-162.
[55] Bossert, Carol. "Labels Unleashed: Breaking the Tyrrany of Information." *Exhibition*. (2016): 19.
[56] The Information Architecture Institute, https://www.iainstitute.org/what-is-ia (accessed April 15, 2019).

consultant, "making a page scannable is about helping people who are not reading entire sentences to accomplish two goals:

- Decide whether the page has the content they were looking for—or, if it doesn't, whether the page is of interest to them anyway.
- Understand what information is on the page.

Goldstein writes that a more scannable page has more value to users: they are proven to be more likely to stay on the page, and they're "more deeply involved with its content."[57]

According to Chao Liu, Ryen White, and Susan Dumais of Microsoft Research, users typically decide whether to stay on a page within ten seconds, and "Often, when people arrive on a page, they immediately begin scanning to decide whether the page has value to them."

Key elements of scannable text:

- White space. Goldstein says that leaving plenty of space around headings, paragraphs, quotes and lists helps readers' eyes skip down the page.
- Bulleted and numbered lists. Again, use white space after each item.
- Subheadings. Goldstein advises descriptiveness over cleverness, so that scanners can "decide and understand."
- Emphasis. "Use bold and italics sparingly to emphasize key points outside of headings."
- Blockquotes and pull-quotes.
- Short paragraphs. One-sentence paragraphs can be useful rhetorical devices, as they get more emphasis. Short paragraphs also help visitors move through the text more quickly.[58]

Benefits of scannable text in online settings:

- Better understanding of a site's structure
- More favorable subjective ratings of a site's credibility, content quality, ease of use, and likability, plus better self-reported affect

[57] Goldstein, Devan. "Scannability: Principal and Practice." *UX Matters*. https://www.uxmatters.com/mt/archives/2015/06/scannability-principle-and-practice.php (accessed April 15, 2019).
[58] Ibid.

- Reduced bounce rates
- Higher likelihoods of return visits[59]

The Ekarv method

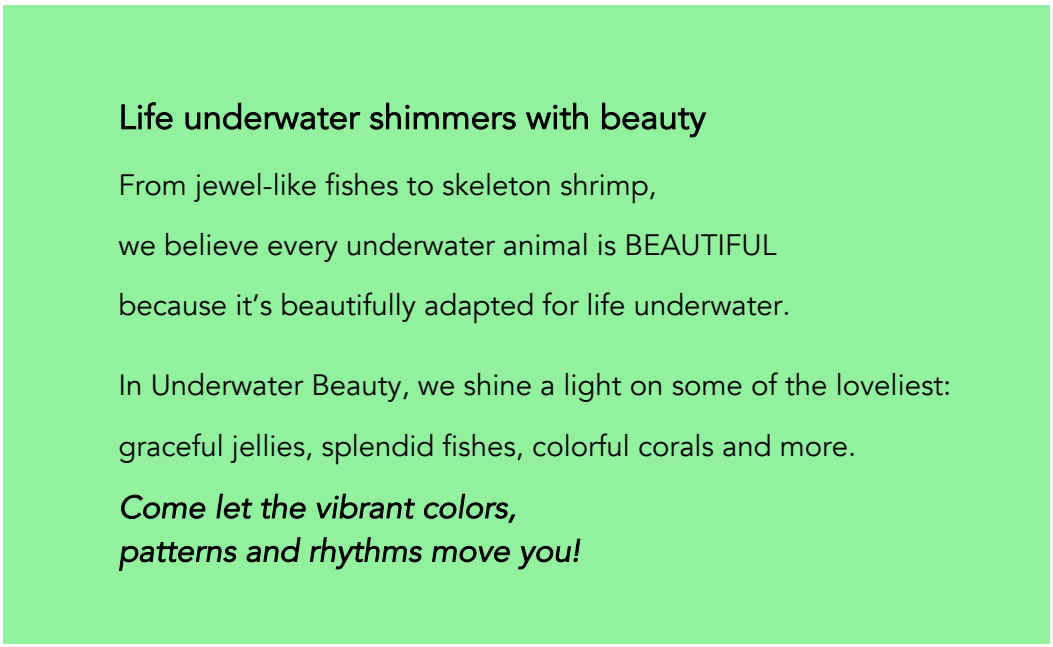
Developed by Swedish writer Margareta Ekarv, this method is a set of guidelines for writing attractive, scannable exhibit labels. Visitor evaluation at the Swansea Museum's Egyptology exhibit indicated that 75% of visitors read some of the labels written with this method, and almost all visitors referred to the labels while looking at objects.[60] Readers reported enjoying the labels' informal, rhythmic quality. They didn't find their simplicity patronizing, and the design of the labels made the text easy to read for older visitors.[61]

Ekarv Guidelines

- One idea expressed per line
- Line breaks placed at natural pauses in a sentence
- No more than 3 lines per sentence
- Simple sentence structures, no complex clauses
- Use active forms of the verb where possible
- Conversational rhythms, easily spoken out loud
- Maximum 52 characters per line (including spaces)
- Maximum 8 lines per paragraph
- Maximum 15 lines for labels, 22 lines for panels (including spaces)[62]

When applied to exhibit texts, scannability is likely to have some of the same benefits as scannable text in online settings, with "reduced bounce rates" being translated to "longer time spent reading and looking."

[59] Ibid.
[60] https://www.swfed.org.uk/wp-content/uploads/2013/02/The_Ekarv_Method.pdf
[61] Ibid.
[62] Ibid.



Judy Rand's introductory text for "Underwater Beauty"
at the John G. Shedd Aquarium employs the Ekarv method.

3b. COMBINING TEXT WITH OBJECTS, IMAGES, AND OTHER SENSORY ELEMENTS

Suggestions from museum theorists

There are many known and researched benefits of integrating exhibit text with objects and images. Stephen Bitgood says "the relationship between the label and the object it describes is important for two reasons: 1) **attention capture** (labels close to the objects are more likely to be noticed) and 2) the **value of engaged reading** (reading requires less effort if the label is close to the object it describes.[63] Beverly Serrell also indicates the value of integrating text and images. She says that exhibit labels can be combined with "nonverbal communication through graphics (e.g., illustrations, icons, photographs) [to] **reach people who do not want to rely on words.**" Serrell adds that "for readers, graphics can serve to reinforce and add new dimensions to verbal and **concrete experiences**." In addition, "changes in mood through lighting, color, texture and sound can vary the nature of sensory experiences in nonverbal ways." Serrell

[63] Stephen Bitgood, *Attention and Value*, 132.

describes how the Detroit Institute of the Arts did tracking studies showing that in situations where particularly attractive objects were displayed, the recommendation was for *more* text. "The evaluator's recommendation was to experiment with expanded forms of object labels at works of art that attract the most attention." Serrell's suggestion is to "make most…labels shorter, except occasionally where there is evidence that many people…are paying attention to an object—those things that are attracting the most eyeballs ready and eager to read. But still, keep those paragraphs short, like tweets."[64]

Multi-media theory from the field of Narratology

Museum professionals frequently refer to exhibitions and exhibit text as a form of storytelling. This is evident in the responses to the three-question interviews this researcher conducted at the beginning of this study. For example, in answer to the question "what are the main goals/visitor outcomes you have in mind when writing introductory labels for exhibitions?" responses included "In terms of…intro text we use language directly from the big idea, …make it part of a story." And, "…visitors should understand what the story of the exhibit is all about." With this in mind, it is worth examining how the field of narratology* investigates the **roles of various media** in contributing to an overall story. Narratologist Marie-Laure Ryan states, "yes, language is the privileged medium of summaries because it can articulate the logical structure of a story. But this does not mean that media based on sensory channels cannot make unique contributions to the formation of narrative meaning. There are, quite simply, **meanings that are better expressed visually or musically than verbally**." Further, Ryan describes cognitive research suggesting that "the mental representation of a story involves various types of images…, as an informational pattern stored in the mind…. Certain aspects of narrative could be stored as words (for instance, the memorable replies of characters) or as visual images (the setting or the appearance of characters)." This research leads Ryan to consider **our cognitive understanding of narratives to be a 'multimedia' construct**.[65]

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[64] Beverly Serrell, *Exhibit Labels,* 81, 104.
[65] Ryan, Marie-Laure, ed. *Narrative Across Media: The Languages of Storytelling*. (University of Nebraska Press, 2004), 12.

Ryan goes on to articulate how various forms of media, such as oral and written, can complement and draw from one another. Oral narrative is likely to include "high concentrations of **detail or imagery**; use of the **active voice** instead of the passive voice; parallel (that is, **list-like**) constructions rather than embedding or hypotaxis; and use of **direct quotation** of [characters.]" Ryan refers to these features as "involvement-oriented," meaning that oral narrative is based on interpersonal involvement between speaker/writer and audience…whereas strategies with literacy grow out of focus on content."[66] She says that written narrative can adopt more of these involvement-oriented features to employ the qualities of oral narrative.

[66] Ibid., 54.

A Storyteller's Story

Fran Stallings is a live storyteller who's done a lot of research on the psychology of audience response to oral narration. "You can tell if the audience is with you or not. Years ago I wrote a literature research article, often cited by scholars. It's about a particular form of audience response called the Story Listening Trance. A psychology friend came and observed an audience while I told a story. She agreed that they are in a light stage of conscious-alteredness. Even an audience unfamiliar with face-to-face storytelling like that. Yesterday I told an Oto nation story. At the beginning, it says '*When this territory was nothing but dirt and grass and sky*'—and I say it that slowly, and gesture: 'dirt' (slowly), and 'sky' (and gesture overhead)—and man, you can see it. It happens right there. It's not even a cutesy 'once upon a time'—it's mythology."[67]

[67] Fran Stallings, interviewed by the author, February 3, 2019.

Museum theorist Carol Bossert suggests that exhibit teams take inspiration from other forms of storytelling when thinking about combining text and image. She says "graphic novels that artfully combine words and pictures can offer insights into ways that labels might become better graphic narrators."[68] Ryan describes how graphic novels integrate text and image in a way that reduces the need for text ("**economy of visual narration**") and establishes a clear sense of sequencing. She says that the segmented panels common in graphic novels "[use] the eye of the spectator moving from panel to panel to keep narrative time running. The reader constructs a storyline by assuming that similar shapes on different frames represent common referents; by interpreting spatial relations as temporal sequence (subsequent moments in adjacent frames); and by inferring causal relations between the states depicted in the frames." She goes on to say that the moments depicted in these frames "**should be easily connectable and narratively significant: they must represent a change of state that affects the goals of the characters**." This method of conveying a change of state compliments that suggested by Lisa Kron, in the context of introducing a novel, in the above literature review (2a.) Ryan notes that the use of multiple visual frames "allows the representation of more complex stories and projects a clearer narrative intent than single frame pictures." She adds that the **repetition of a subject** is important in visual narrative, as this is "the primary means for us to know that we are looking at narrative at all."[69]

[68] Bossert, Carol. "Labels Unleashed: Breaking the Tyrrany of Information." *Exhibition*. (2016): 19.
[69] Marie-Laure Ryan, ed. *Narrative Across Media,* 179, 141-42, 196.

Exhibit teams can put this into practice by:

- Incorporating objects or images that visitors are known to find particularly attractive or surprising, with introductory text. This will be more effective if the attractiveness, strangeness, etc. of the media or object is evaluated with visitors.
- Leveraging the strengths of oral narration by incorporating video of people telling stories to introduce an exhibit or adapting "involvement-oriented" qualities described above into introductory text to facilitate conversation.
- Taking inspiration from graphic novels when integrating text and image in introductory texts; establishing surprise and conflict (as described in section 2a) through strategic framing, pacing, and repetition of images in correlation with text—potentially throughout the threshold.

4. Label Writing (and writing labels about science)

There is a wealth of literature and research in writing labels for museum exhibitions. Current best practices include knowing the audience and writing accordingly; using the labels to tell engaging stories; using appropriate word count; and arranging information effectively. Because this study includes prototyping introductory text at the Saint Louis Science Center, this section of the literature review incorporates best practices in writing labels about science.

4a. WRITING FOR YOUR AUDIENCE

In her book *Museum Labels*: *An Interpretive Approach,* Beverly Serrell says label writers must keep in mind "the visitors' emotions, their yearning for continuity, love of a good story, and natural spirituality."[70] In her book *Writing Science in Plain English*, Anne Greene says the most important first step to writing science is to envision your audience. Her advice is to "help them by making your writing as clear as possible …; err on the conservative side …; write for the

[70] Beverly Serrell, *Exhibit Labels,* 54.

reader who may be least informed."[71] Serrell and Greene agree that writers must consider visitors' reading levels when writing for maximum accessibility. Serrell says, "There is no single right level, but a good guideline is not to write below a sixth-grade level or above an eighth-grade level." She suggests two methods for assessing labels' success in reaching the right audience: one is to "core" edit or omit words above a fifth- or sixth-grade level to see if the text still makes sense. The other is to conduct a front-end evaluation of a sample audience's response to text.[72]

Serrell explains that the key to maximizing labels' accessibility is to consistently "support the big idea" and to "use a non-exclusionary vocabulary."[73] Similarly, Greene advises writers to make their messages clear, impactful, and inclusive through several means of simplification. She explains that short words should be used in place of long ones (for example, *implement* can be substituted by *put*; *adhere* by *stick*.) She says to "rethink technical terms," meaning "the in-house language of any group of people who share a particular expertise or interest." Such terms should be used "only when you are sure that all your readers will understand them." If there's a doubt about what the audience knows, she advises label writers to "be conservative and define your technical terms or leave them out."[74] Science writer Nancy Baron also recommends simplification. She says to "trim as much jargon as you can." For example, *benthic* can be replaced by "bottom-dwelling, which we call benthic," or just "bottom-dwelling."[75] Like Greene, Baron says it is ok to sometimes use the more complicated term as long as it is defined. (In contrast, Robin Faitoute of the National Aquarium said during an interview for this study that her team tries to avoid technical scientific terms altogether whenever possible: for example, at the time of the interview, there was an ongoing debate

[71] Anne E. Greene, *Writing Science In Plain English*, 4.
[72] Beverly Serrell, *Exhibit Labels,* 92-93.
[73] Ibid, 44.
[74] Anne E. Greene, *Writing Science In Plain English*, 44, 36.
[75] Nancy Baron, *Escape from the Ivory Tower: A Guide to Making Your Science Matter* (Island Press, 2010), 26.
* The content experts asked if the team preferred the word "a**hole."

between the Aquarium's developers and content experts about whether to use the word "cloaca."*)

4b. TELLING STORIES IN LABELS

Greene emphasizes the power of storytelling when writing about science. She says people instinctively recognize stories that feature characters and their actions, and storytelling makes complex scientific ideas seem simpler and more exciting.[76] Serrell also describes the importance of telling engaging stories. She says "good storytelling carries the listener along with the sound of the words and the images they create, and lets the listener **participate by anticipating where the story is going**. Good interpretive labels strike a good balance between what the reader might anticipate is coming next and what does."[77]

Serrell and Greene both draw on Joseph M. Williams' principles of writing from his book *Style: Ten Lessons in Clarity and Grace,* in which he explains how to structure sentences to tell a compelling story. Williams' principle has two parts:

- In the subjects of your sentences, name your cast of characters.
- In the verbs of your sentences, name the crucial actions in which you involve those characters.[78]

Greene, Serrell and Baron expand upon the first of these principles. Serrell says that to make labels relevant to visitors, writers should **place people (rather than objects) as the subjects of text when possible**.[79] Baron recommends that scientists who write about their own work include personal details and make themselves the prominent character / subject of their stories, because readers tend to be interested in other peoples' passions and emotions.[80] Greene takes a more expansive view, **defining "character" as "a tangible, concrete noun,"** including trees,

[76] Anne E. Greene, *Writing Science In Plain English*, 12.
[77] Beverly Serrell, *Exhibit Labels,* 24.
[78] Williams, Joseph M. *Style: Lessons in Clarity and Grace*, 11th ed. (University of Chicago Press, 2014), 35.
[79] Beverly Serrell, *Exhibit Labels,* 25.
[80] Nancy Baron, *Escape from the Ivory Tower: A Guide to Making Your Science Matter* (Island Press, 2010), 28.

cells, minerals, etc. Greene says science writing often uses abstract nouns (such as *understanding* or *development*) instead of verbs (*understand*; *develop*.)[81] As she explains, readers have difficulty visualizing a subject if it is expressed by an abstract noun rather than a concrete one.

Williams' second principle states that the sentence's action should be described with a strong verb.[82] Greene adds, "strong verbs enliven a reader's interest by making vigorous connections between the characters in a sentence and the things they act upon." She stresses the importance of placing subjects and verbs close together. After readers identify the subject as the story's character, they immediately look for the verb that describes what the character is doing. If there are too many words between subject and verb, the reader is likely to forget what the subject was and to ignore the words in between.[83]

[81] Anne E. Greene, *Writing Science In Plain English*, 13.
[82] Joseph M. Williams, *Style: Lessons in Clarity and Grace*, 11th ed. (University of Chicago Press, 2014), 35.
[83] Anne E. Greene, *Writing Science In Plain English*, 16.

A Storyteller's Story

Helen Kearns is a documentary film editor who often hooks in viewers with a funny or intimate moment featuring the main character.

"Character and humor are the two biggest ways to hook the audience. I always want to find a moment, or an anecdote, or a short story that's going to endear the audience to the character ASAP; to get them into the world of the character. A lot of times that is through humor, because you want to have that crack where viewers can relax, smile, and be open. That's not always the direction you want to go, like if it's a serious film—but I think finding something that feels intimate is a number one hook."[84]

[84] Helen Kearns, interviewed by the author, January 18, 2019.

4c. HOW MANY WORDS?

Serrell suggests one to seven words for main titles, 20-300 words for group labels, and 20-150 words for artifact text. She emphasizes: "stick to the point or ideas that support the big idea best." Serrell notes that visitors tend to scan text panels of 200 words or more to look for essential information. She recommends writers vary the length of captions depending on the intrinsic value of the object described, keeping them short enough for visitors to be able to **read the whole label in 10 seconds or less**: around a 50-word maximum.[85] Greene also advises using minimal text when writing about science for general audiences, limiting paragraphs to 150-200 words, and varying in word count from one to the next. She also says scientific ideas should be expressed "with no surplus words, omitting what our readers can easily infer." Writers can reduce word count by using concrete nouns instead of abstract ones, simple words instead of strings of nouns, and placing subjects and verbs close together. Greene says science writing often uses phrases where one word would suffice: for example, *were responsible for* as opposed to *caused*. She also suggests saving words by changing negatives to affirmatives: for example, *did not allow* can become *prevented*.[86]

[85] Beverly Serrell, *Exhibit Labels,* 43, 36.
[86] Anne E. Greene, *Writing Science In Plain English*, 67, 40, 48.

4c The introductory text for *Giants of Land and Sea* at the California Academy of Sciences is 48 words and takes around 15 seconds to read out loud.

Climb high and dive deep to discover what connects the giants of Northern California's coast. Powerful forces sculpt our landscape, towering redwoods drink from the fog, and mighty whales travel through bountiful coastal waters. Together, we can celebrate and sustain this extraordinary place.

4d. ARRANGEMENT OF INFORMATION

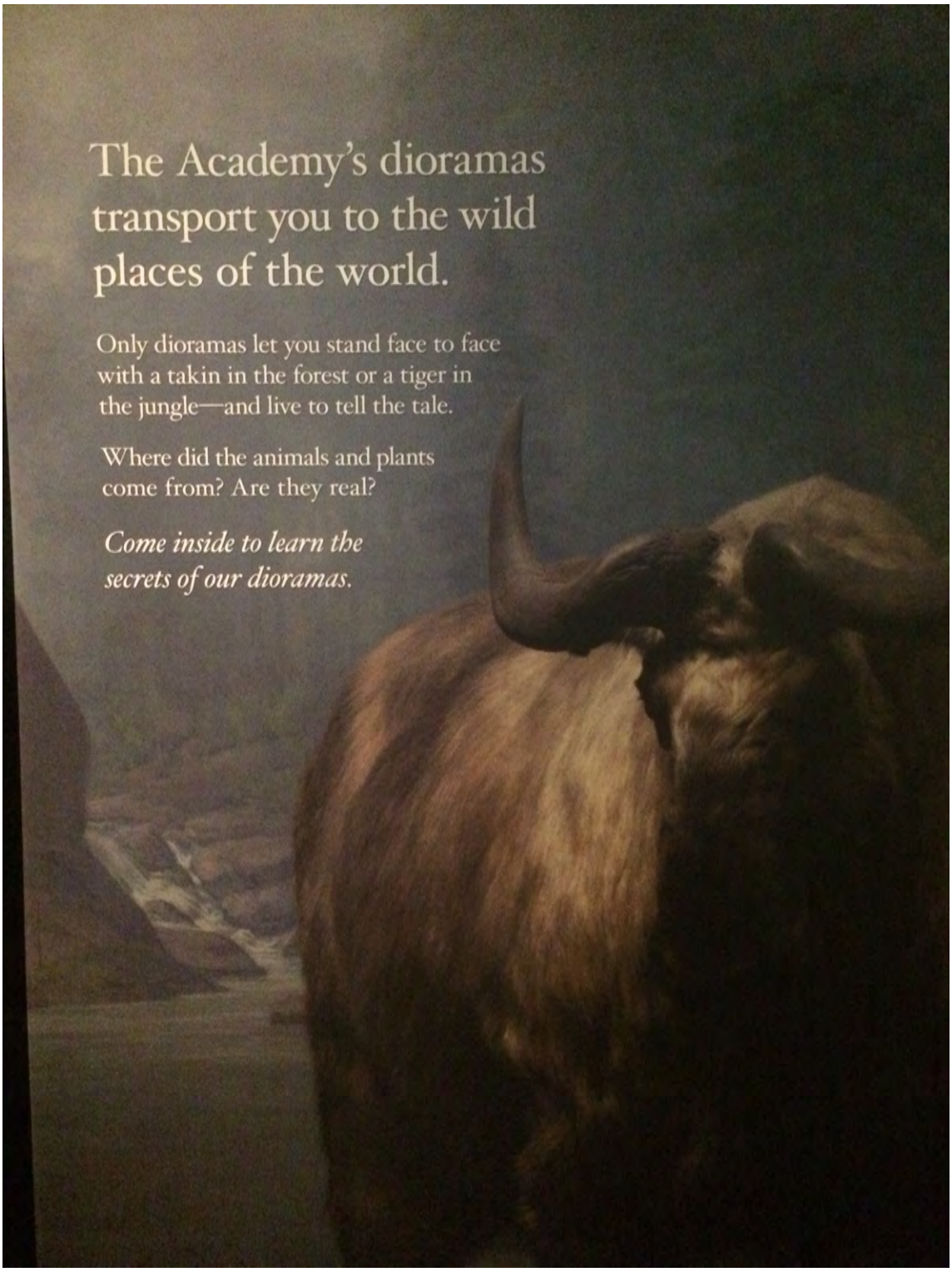
Placing specific kinds of information strategically within a body of text facilitates effective communication. Greene says "if you place the right information at the beginnings and ends of your sentences, you will meet your readers' expectations, and your paragraphs will form cohesive units." **Old information** (meaning the subjects readers have become familiar with) **should go at the beginnings of sentences.** Greene says "this allows [readers] to concentrate on what you tell them *about* those subjects." **New information**—what readers are learning about the subjects—**should come at the ends of sentences**. Greene says "readers pay particular attention to information at the ends of sentences, so save them for what you want your reader

to remember." For example, a paragraph about quantum mechanics places the subject of quantum mechanics at the beginning of each sentence, with new information about that subject (its successes, uses, puzzles) coming second. Greene provides a caveat. She says, "if your character is likely to be unfamiliar to your readers, you should devote one or two sentences to describe it—remembering to introduce your character where readers are most likely to notice it—at the ends of descriptive sentences." She adds, "***Never*** **surprise readers by introducing a new character at the beginning of a sentence. First alert them to the new character at the end of the previous sentence.**"[87]

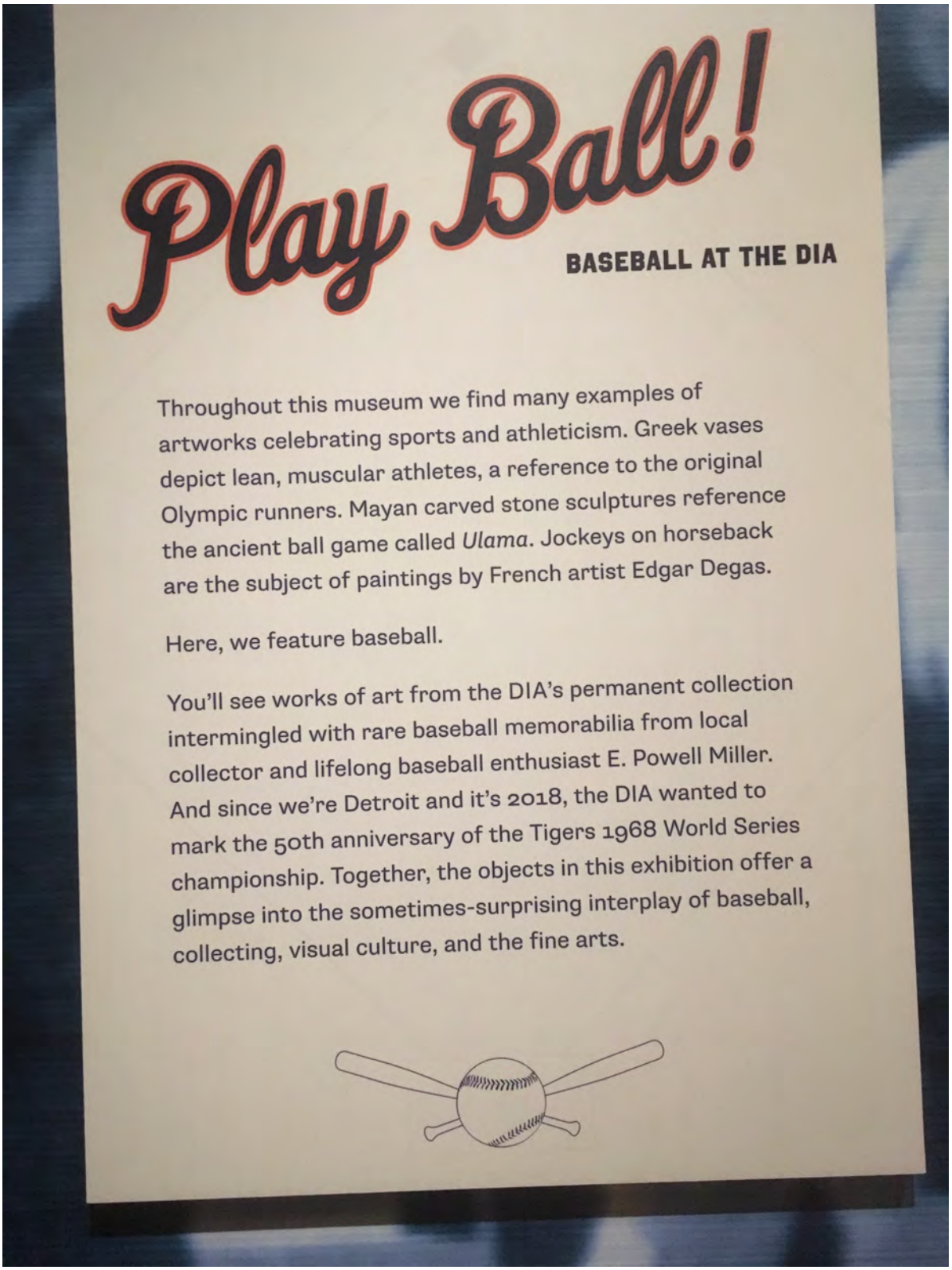
Exhibit teams can put this into practice by:

- Testing out text on visitors to see if they can read and get the Big Idea in ten seconds.
- Writing as if speaking directly to the visitor(s); using language like "we" and "you" to create a sense of unity between the institution's and the audience's identity.
- Science-based teams can consider who or what the "characters" of their subject matter are: corn plants or farmers, etc.

[87] Anne E. Greene, *Writing Science In Plain English*, 52-54.



4d.1 The introductory text for Secrets of the Diorama at the Academy of Natural Sciences in Philadelphia speaks to "you" and welcomes you in to explore.



4d.2 The Detroit Institute of Arts uses "we" to connect the institution to the visitors, and "you" to let visitors know what's in it for them.

4d.3 "Dear Listener," an exhibit by a Native American artist at the Heard Museum in Phoenix, features a fairly standard curatorial introduction as well as introductory text by the artist. The artist speaks in first person, and directs his message to "you": '*I offer you an opportunity to listen and reflect…*'

5. Storytelling and Narrative

Novelist Robert Swartwood writes: "For me, a story should do four basic things: obviously it should tell a story; it should be entertaining; it should be thought-provoking; and, if done well enough, it should invoke an emotional response. Now, if those four basic principles can be applied to a story of twenty-five hundred words, why can't they be applied to an even shorter story?" Carol Bossert refers to this passage in her essay "Labels Unleashed: Breaking the Tyranny of Information" as a model for label writers. Bossert's comparisons between exhibit labels and other forms of storytelling is somewhat rare in museum literature. The literature review below offers additional insight for ways in which exhibitions teams can pull inspiration and strategies for storytelling (and particularly for starting a story, via introductory text) from the field of narratology at large. (5a) contains a selection of straightforward outlines of classic story components; an articulation of what "theme" and "plot" are in the context of novels and other media; and a description of the purpose of "cause and effect." (5b) focuses on how narratives facilitate learning and engagement.

5a. WHAT *IS* A STORY EXACTLY? – AN OVERVIEW FOR EXHIBIT TEAMS

Elements of story

In her book *Wired for Story*, Lisa Kron says a story is "how what happens affects someone who is trying to achieve what turns out to be a difficult goal, and how he or she changes as a result." She breaks story down further as follows:

- "What happens" is the **plot.**
- "Someone" is the **protagonist.**
- The "goal" is what's known as the **story question.**
- And "how he or she changes" is **what the story itself is actually about.**[88]

Narratologist Laure-Marie Ryan also lists the components of a story, in which she includes characters with goals, and elements similar to Kron's "what happens" and "how he or she changes." Ryan says a story must do the following:

[88] Lisa Kron, *Wired for Story*, 33, 11.

- initiate the [reader] into **a world**
- create **characters** and give them distinct identities
- give **goals** to the characters
- suggest **causal relations** between events and states
- monitor the **flow of time** and perform jumps across the chronological sequence
- express or inspire **value judgments**, and so on.[89]

Kron also describes the concept of "focus," or the synthesis of three elements that work in unison to create a story: the protagonist's issue, the theme, and the plot.

- The protagonist's issue stems from the story question **[their goal]**.
- The story is ABOUT what she has to overcome internally to achieve her goal **[their issue]**.
- The **theme** is what [the] story says about human nature.
- The **plot** is the events that force the protagonist to deal with her issue as she pursues her goal.[90]

More on theme and plot

Kron explains that "the first of these two elements, the protagonist's issue and the theme, are the lens through which we determine what the events (the plot) will be." She goes on to articulate that a **theme lets us know what the story tells us about what it means to be human**, and how (according to the story) "humans react to circumstances beyond their control." Knowing the theme "creates a gauge against which your characters react to everything." In an impersonal universe, they find there's no one they can really relate to; in a loving universe, with a little gumption, she'll find true love. Themes might read as "people are good eggs after all" or "people are best avoided if possible." The theme reveals the point the story is making.[91]

[89] Marie-Laure Ryan, ed. *Narrative Across Media,* 196.
[90] Lisa Kron, *Wired for Story*, 29.
[91] Ibid., 29-30.

A Storyteller's Story

Pete Griffin believes that with environmental communication, the theme is always about humans achieving success. "A lot of the folks we run into aren't there to specifically learn. They want to be entertained, and that's something I've really come to understand from [environmental storytelling] on cruise ships. So, we need to tell stories about successes: bringing the bald eagle back from the brink of extinction. In the 70s and 80s, there was the hole in the ozone layer, because of chlorofluorocarbons, but we banned those and the holes have shrunk. There are things we can do that have an effect, and we can't just talk about gloom and doom. If people hear success stories, they'll feel like there's a point in pitching in."[92]

[92] Pete Griffin, interviewed by the author, January 14, 2019.

Kron says that **a story is about how the plot *affects* the protagonist.** Plot facilitates the story by forcing the protagonist to deal with the issue that's an obstacle to their overarching goal. "The way the world treats him, and how he reacts, reveals the theme. What the protagonist is forced to learn as he navigates the plot is what the story is about." An example of theme might be "integrity is worth far more than wealth," while an example of plot is "a character wrestles with things until he learns this lesson." Kron says "**theme is where the universal lies.** The universal is a feeling, emotion, or truth that resonates with us all…[and] only when embodied in the ***very specific*** does a universal become accessible."[93]

Cause and Effect

Kron says that a story "follows a cause-and-effect trajectory from start to finish." In creating this trajectory, the storyteller can instill **conflict and surprise** by indicating that something would happen as a result of an event, and then making something different happen instead. Kron says "since the brain analyzes everything in terms of cause and effect, when a story doesn't follow a clear cause and effect trajectory, the brain doesn't know what to make of it—which can trigger a sensation of physical distress. Keeping your story on track boils down to: IF, THEN, THEREFORE…. **Action, reaction and decision drives a story forward**"—in other words, everything affects this cause-and-effect trajectory. What may be of interest to exhibit teams is that, as Kron says, this does not mean a story has to be linear or chronological. She explains that "what must move forward from page one is the clear logic of the emotional arc—the story the reader is following." Furthermore, cause and effect impact both the protagonist's **internal struggle** and the **external events**, or the plot, so that both of those create a "**seamless narrative thread**." Cause and effect not only indicate why something happens as a result of something else; it also tells the reader why a character acts in a certain way and how that character's worldview impacts their actions. The cause and effect trajectory helps readers track how the protagonist's actions are motivated by his inner issue and how they either deter or help him in reaching his goal.[94]

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[93] Lisa Kron, *Wired for Story*, 33.
[94] Ibid., 47, 156.

Kron says the goal with developing cause and effect is to "be sure each individual scene effectively uses its specific 'action, reaction, decision' to evoke maximum tension and to up the odds." She says that with each new scene it helps to ask "'what does my protagonist want to have happen during this scene?'" and to ask 'what is at stake here? What will it cost her to get what she wants?'" Before moving to the next scene, the writer can ask if the protagonist has changed.[95]

5b. LEARNING AND ENGAGEMENT THROUGH NARRATIVES

Recent research shows that we have evolved to pay attention to stories because we learn valuable lessons from them. Narratologist Marie-Laure Ryan says "narrative…constitutes a logic in its own right, **providing human beings with one of their primary resources for comprehending experience and organizing interaction**."[96] Lisa Kron's book "Wired For Story" covers this phenomenon in detail. She says "our brain is hardwired to respond to story; the pleasure we derive from a tale well told is nature's way of seducing us into paying attention to it." Kron explains how stories help us navigate difficult situations and even empathize with protagonists whose experiences might be different than ours. But in order for us to really become engaged, stories must have a specific structure. Kron explains that what "hooks" us is "the **firing of our dopamine neurons, signaling that intriguing information is on its way.**" For this reason, Kron says "There has to be a ball already in play…. Not only must something be happening, but also there must be a consequence we can anticipate." Kron goes on to explain how this set-up **facilitates learning and even empathy**: "we have hard-wired expectations for every story that it will plunk someone with a clear goal into an increasingly difficult situation they then have to navigate. When a story meets our brain's criteria, we relax and slip into the protagonist's skin, eager to experience what his or her struggle feels like, without having to leave the comfort of home."[97]

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[95] Ibid.
[96] Marie-Laure Ryan, ed. *Narrative Across Media,* 50.
[97] Lisa Kron, *Wired for Story*, 2, 12.

Researchers recently conducted MRI scans to determine the extent to which stories can stimulate empathy and emotions in readers. Kron says the study revealed that "the areas of the brain that lit up when [subjects] read about an activity were identical to those that light up when they actually experience it." Kron explains that that's because we mentally simulate "each new situation encountered in a narrative" and integrate actions and sensations from the text with personal knowledge and experiences. "When we read a story we slip into the protagonist's skin, feeling what she feels, experiencing what she experiences. What we feel is based, 100 percent, on her goal which then defines how she evaluates everything the other characters do." Kron elaborates on how important it is for readers to understand the protagonist's goal, explaining that if the reader isn't aware of a goal "the action doesn't add up; there's nothing to follow, which makes it impossible to anticipate what will happen next. **It is anticipation that creates the intoxicating sense of momentum that hooks a reader.**"[98]

Anne E. Greene agrees, and expands on this finding to explain how science communicators can harness the power of story. Greene says "our brains are wired to recognize stories with a particular structure, one that features characters and their actions, and information presented this way becomes compelling and memorable. **Scientists can use these same elements of stories—characters and actions—to write about the real world with the same desirable results**…. We can hang complex ideas on the scaffolding of good, simple stories and make our science as exciting to our audience as it is to us."[99] Robert McKee describes how stories and curiosity combine to keep us engaged. He says "*Curiosity* is the intellectual need to answer questions and close open patterns. *Story* plays to this universal desire by doing the opposite, posing questions and opening situations."[100]

Kron says that "the instant a reader opens your book, his cognitive unconscious is hunting for a way to make life a little easier, see things a little clearer, understand people a bit better." She

[98] Lisa Kron, *Wired for Story*, 67-70.
[99] Anne E. Greene, *Writing Science In Plain English*, 12.
[100] Lisa Kron, *Wired for Story*, 15.

says to ask what it is you want readers to walk away thinking about, what point your story makes, and how you want to change the way the reader sees the world.[101]

Exhibit teams can put this into practice by:

- Considering how a trajectory of cause and effect, with elements of surprise and conflict, plus other elements of classic story structure like characters.
with goals and a plot, all help to create an engaging narrative that facilitates learning and empathy.
- Using humor and personal questions to incite empathy at the beginning of exhibits.

[101] Ibid, 31.

A Storyteller's Story

Motoko Dworkin is a Japanese-American storyteller who regales live audiences with cultural and personal tales. She uses a 4-part story structure to create empathetic connections with her audience. "You always have to look at your story from the audience's point of view. According to that you have four possible responses: 1) *haha*. Almost always I start with some kind of humor: this relaxes the audience. 2) *aha*. An intellectual discovery; intellectual connection. 3) *ahhhh* moment: meaning there should be an emotional connection. I might be telling about my son going through a hard time, so the goal is to get them to connect with me on an emotional level. 4) *Amen*. As in, so be it; the world is the way it should be. The goal here is to accept the world as it is and recognize the lesson it contains for me and my audience. Ideally, any story should have these four elements." **Motoko also uses humor and rhetorical questions to help certain audiences empathize with her ethnic identity.** "Sometimes I look very exotic to my audience. They're curious; they have to know I'm a safe and interesting human being. And I'm from Osaka—a city known for its humor. And I have to meet audience where they are—sometimes that's by posing a rhetorical question. Like, "have you ever done something you knew you weren't supposed to do?" You have to be on the stage as you are. You have to play the card that's dealt to you."[102]

[102] Motoko Dworkin, interviewed by the author, February 17, 2019.

To conclude this literature review, significant research exists in "getting attention" through various media; "keeping people engaged" in museums and elsewhere; designing for attraction and engagement online and in museums; writing labels for museum exhibitions and for informal science engagement; and in storytelling through a variety of media. All of these fields offer valuable insight for exhibit teams as they work toward understanding their visitors' interests and expectations and addressing those through attractive, engaging, clear introductory texts. Storytelling and narrative is perhaps the area of literature that underlies all of the categories synthesized in this study. As described in this chapter, stories capture attention when they contain core elements of characters, goals, conflict, cause and effect, themes, and strategic pacing. To understand how exhibit teams consider their audience and employ these elements of story as they plan engaging introductions, this researcher surveyed museum professionals from a variety of institutions. The following chapter describes that process and the findings.

Chapter 3: Methodology

GOAL AND RESEARCH QUESTIONS

The goal of this research was to understand successful approaches to, and challenges in, creating and displaying introductory texts in exhibitions, and to use that data to prototype design solutions at the Saint Louis Science Center.

My research questions were:

1. What practices have been found to be successful for writing and displaying introductory texts?
2. How can introductory text be integrated into the overall design of an exhibit threshold in a way that increases attraction, engagement, and orientation?
3. What implications does the field of narratology have for writing and displaying introductory text?

METHODOLOGY APPROACH

This research took a qualitative case study approach, using interviews.

Sample 1

Exhibit developers interviewed included the following 17 individuals:

- **Laura Allen**, Exhibition and Editorial Consultant, NY, NY
- **Jessica Bicknell,** Head of Exhibitions, Penn Museum, Philadelphia, PA
- **Jane E. Boyd,** Exhibit Developer/Museum Consultant/Writer & Editor, Philadelphia, PA
- **Eileen Campbell,** Sr. Science Writer, Exploratorium; Owner of Farallon Media, San Francisco, CA
- **Sara Crawford**, Exhibit Developer, Natural History Museum of Los Angeles County, Los Angeles, CA
- **Robin Faitoute**, Manager of Exhibit Development, National Aquarium, Baltimore, MD
- **Randi Korn**, Owner of Randi Korn and Associates, Washington D.C.
- **Erin McLeary**, Museum Director, Science History Institute, Philadelphia, PA
- **Irina Mihalache**, Assistant Professor of Museum Studies at University of Toronto
- **Sasha Nemecek**, Associate Director of Exhibitions, American Museum of Natural History, NY, NY

- Christine Reich, Vice President of Exhibit Development and Conservation, Museum of Science, Boston
- Michael Rigsby, Interpretive Planner, Writer, & Developer, Athens, OH
- Tamara Schwarz, Director of Exhibit Development & Strategic Planning, California Academy of Sciences, San Francisco, CA
- Karen de Seve, Principal of Creative Content Studio, Philadelphia, PA
- Page Talbott, Principal of Talbott Exhibits and Planning, Philadelphia, PA
- Bonnie Wallace, Independent Museum Label Writer and Editor
- [Anonymous], Interpretive Planner & Content Developer at [Anonymous firm]

The above individuals were chosen based on a search for winners of the AAM Excellence in Label Writing awards between 2015 and 2018, and through the professional network associated with the University of the Arts. A breadth of geographic locations and size of institutions and companies are represented here. See Appendix C for an abridged record of these interviews.

Sample 2

Storytellers interviewed included the following six individuals:

- Mika Chance, Writer/Producer at Cheddar Inc.
- Motoko Dworkin, Teaching Artist & Professional Storyteller with a focus on folklore from Japan
- Diane Ferlatte, Professional Storyteller with a focus on African-American folklore from the American South
- Pete Griffin, National Storytelling Network Alaska Liaison and former park ranger/biologist
- Helen Kearns, Documentary Film Editor
- Fran Stallings, Professional Storyteller with an environmental focus

The above individuals were chosen based on a Google search for storytellers in Saint Louis, as this researcher was interested in expanding her professional network in the midwestern region after having moved there to work at the Saint Louis Science Center. All of the above with the exception of Helen Kearns and Mika Chance were listed as upcoming participants in the 2019 Saint Louis Storytelling Festival. Kearns and Chance are personal friends of this researcher and offered unique perspectives from a younger demographic and from the fields of filmmaking

and journalism. Relevant quotes from these interviews are woven through this study with the heading "A Storyteller's Story".

Sample 3

Visitor researchers/evaluators represented the following firm and institutions:

- Randi Korn and Associates (reported on a project with the National Museum of the American Indian, Washington, D.C.)
- Museum of Science, Boston
- Science Museum of Minnesota

The above individuals were not chosen but were random participants in an online survey this researcher posted on professional practice list-servs.

Data Collection: Semi-structured Interviews

This researcher developed interview questions for all of the above samples. Samples 1 and 2 were designed with flexibility to allow for expansion on certain topics as necessary, in order to collect qualitative data regarding each exhibit developer interviewee's current and past professional experiences with the theory and practice of creating introductory texts, and to gather storyteller interviewee's experiences with the theory and practice of storytelling. Sample 3 took the form of an online survey with a combination of open-ended and "yes/no" questions.

The flexible nature of the interviews allowed for in-depth conversation about unique challenges, success stories, and other issues that arose. Interviews for samples 1 and 2 were either conducted over the phone or in person and were recorded with the interviewees' permission. All of the exhibit developer interviews were transcribed; not all of the storyteller interviews were transcribed. The duration of interviews for samples 1 and 2 was between 30 minutes and an hour.

Analysis

Interviews for samples 1 and 2 were coded using inductive/emergent coding. Because there were only five participants for sample 3, relevant responses are incorporated to these findings as was helpful for this study.

Limitations

- This is an investigation of successful approaches to writing and displaying introductory text, with "success" being indicated by visitors engaging with *and reading* the text in order to better anticipate the major concepts and experiences within the exhibition. While it is possible that visitors can understand Big Ideas and other concepts without reading text—and this topic at times arose during interviews—that area of inquiry is beyond the scope of this study.
- During interviews, the challenge of compromising between exhibit teams and curators/content experts arose. While this common challenge is an important consideration in the writing and display of all kinds of exhibit text, addressing it is beyond the scope of this study. Ideally, as museums move toward prototyping labels with more regularity, and as best practices in museums become more widely known and accepted, this will become less of an issue.
- A shift in the field toward multi-lingual labels often arose during interviews. Incorporating multiple languages into introductory text greatly impacts design and visitor engagement, but understanding these impacts would require a separate study.
- One of the primary goals interviewees named for creating introductory texts was to provide visitors with a sense of orientation: an overview of what they're about to see and do. Similarly, Serrell says that "orientation aids which help visitors…prepare for the visit, such as instructions and floor plans on signs,…can increase efficiency of use, time spent, attention and recall."[103] While there is a lot of literature related to designing for wayfinding and orientation, this aspect of designing introductory text is extremely situation-specific and is beyond the scope of this study.

[103] Crane, Valerie, et al. *Informal Science Learning: What the Research Says about Television, Science, Museums, and Community-Based Projects*. (Dedham, MA: Research Communications Ltd., 1994), 71

Chapter 4: Results

Summary

The goal of this research was to understand successful approaches to, and challenges in, creating and displaying introductory texts in exhibitions, and to use that data to prototype text and design solutions at the Saint Louis Science Center.

Participating museum and storytelling professionals were asked questions related to the following research questions:

1. What practices have been found to be successful for writing and displaying introductory texts?
2. How can introductory text be integrated into the overall design of an exhibit threshold in a way that increases attraction, engagement, and orientation?
3. What implications does the field of narratology have for writing and displaying introductory text?

Synthesis of Exhibit Developer Interviews

Five themes emerged during the coding process:

1. Conduct front-end research
2. Engage visitors on a personal level
3. Write and design for "walk-by" engagement
4. Integrate text with objects and/or non-text media
5. Prototype and conduct formative evaluation

Following is an analysis of exhibit developer interviewees' experience and recommendations related to these themes. Incorporated into the end of this analysis are responses from the survey for Visitor Researchers/Evaluators (Sample 3). Due to the minimal number of responses for that survey and their direct relevance to theme 5, above, it was efficient to insert them in bullet-point form at the end of this synthesis.

1. CONDUCT FRONT-END RESEARCH

In response to the question "Do you prototype and/or conduct front-end and/or formative evaluation when creating introductory text? If so, what is your approach?", several respondents stated that because front-end evaluation informs the overall exhibition goals and concepts, and often reveals visitor expectations, the introduction can be based on those goals and address those expectations. Jane E. Boyd and Bonnie Wallace noted that the title itself can be informed by front-end research, which in turn shapes the visual treatment of the title and introduction.

Robin Faitoute described how The National Aquarium's exhibit development process often includes **free-association activities** in which visitors are asked to draw or write whatever comes to mind in relation to a word or image. In the early development stages of "Blue Wonders," an exhibit about the connection between water and all living things, Aquarium staff gave visitors a sheet of paper with an image of water at the center. Visitors connected the image with coral reefs, rainforests, etc. This led staff to ask visitors more explicitly, "What's your connection to water?" Visitors used magnetic poetry pieces to respond. The team decided to use that same question as the only introductory exhibition text. The question was accompanied by "immersive sound, light, sculpture and moving water." The team then drew upon the front-end research, **using visitors' own language to address that question in the threshold** and beyond. Similarly, the California Academy of Sciences in San Francisco uses **card-sorting activities** and interviews with visitors to understand "what kinds of language…visitors use in talking about…concepts, and what questions they have," etc. Tamara Schwarz, Director of Exhibit Development and Strategic Planning, says this helps the team as they "try to come to a place of agreement on how to **introduce the exhibit in a way that…[sparks] visitors' interest**…and effectively prefaces the exhibition content."

2. ENGAGE VISITORS ON A PERSONAL LEVEL

Respondents commonly cited a goal to spark personal connections with visitors through introductory text and design. Their methods of doing this can be broken down into two categories: asking visitors questions and using personal language.

2a. Ask questions

Judy Rand leads teams through goal-setting workshops to "help them set priorities" for the exhibition. These goals apply to each label. Rand notes that "different teams set different goals, but they nearly always include… 'Anticipate and answer visitors' questions.'" This is in keeping with literature on understanding what visitors anticipate will come next, and either meeting or breaking their expectations (see page 12). Exhibit developer Michael Lenahan recommends teams "find the meat of the story and present it to visitors. Make them feel involved through direct questions and provocative facts." In response to the interview question "What are the main goals/visitor outcomes you have in mind when writing introductory texts for exhibitions?", Jane E. Boyd says she will often "pose a question for visitors to think about as they move through the exhibition." Boyd mentioned increased use of questions in introductory texts as a potential positive change over the coming years. She said, "I like the introductory text to be more about…drawing visitors in than about making definitive statements." Boyd cited Elaine Gurian's talk "The Importance of And"[104] as a resource for understanding how museums "should embrace [indeterminacy] and invite visitors into that somewhat uncomfortable feeling."

[104] See Elaine Heumann Gurian, "The Importance of And," talk at MuseumNext Melbourne, February 16, 2017, https://www.museumnext.com/insight/the-importance-of-and/.

2a.1 An exhibit about sustainable fashion at the Victoria & Albert museum poses two introductory questions, orienting visitors to the concepts and sparking contemplation.

2a.2 An exhibit at the Natural History Museum of LA County focuses on scientific inquiry into dinosaurs. Each exhibit section is introduced by a huge question about dinos and sub-text on a supergraphic.

Similarly, the team at MOS Boston uses questions to facilitate what Vice President of Exhibit Development Christine Reich refers to as a "**productive struggle**." The visitor researchers on staff there have found that visitors' emotional engagement with an activity is impacted by the timing with which questions are posed. Reich says, "We can **strengthen emotional engagement** by giving visitors a scaffold and support as they're engaging in activities, as they're investigating a question, as they're engaging in the engineering design process." At the time of this study, the team was experimenting with asking questions to visitors to encourage a

closer look at "mystery skulls." They were investigating whether emotional engagement is stronger when visitors are asked to classify an animal skull using their intuition, vs. when they are offered prompts and questions before forming a hypothesis.

2b. Use personal language

For Beverly Serrell, the goal for introductory text is to "give visitors a quick idea of what the Big Idea of the exhibition is, in **visitor-friendly language.**" Barbara McGrath says that the goal is "to make the exhibition engaging and intriguing; even irresistible—to appeal to the emotions as much as the intellect." Robin Faitoute cites Judy Rand as having been instrumental in moving the field toward writing labels that have the **tone of a friend**; i.e. 'notice how these pines are lots of different sizes?' Faitoute says, "[your friend] would talk on a personal level, and that's how we should write our labels.' The National Aquarium has developed a brand voice that they characterize as "bold, hopeful, approachable, and personal." Faitoute says, "we help people find personal meaning…through words like 'we,' 'all,' 'you.' **We speak to *you*, the visitor**." This is similar to how advertisers appeal to self-interest in headlines (see page 17.) In her introductory texts, Bonnie Wallace also regularly writes as if she's speaking directly to the visitor. She says that the introductory text is about inviting people to come discover a Big Idea. "It's never just, 'Come in,'" she explains; "it's 'Come in to find out about this [topic] and explore these questions."

A Storyteller's Story

Motoko Dworkin tells stories and folktales to live audiences. She thinks of storytelling as a conversation, or "circulation" of energy with her audience. "So the longer I do this, the more I find out: success isn't that I got out there and looked good and sounded good, but the goal is to build a circulation of energy between me and my audience. I throw something and they have to throw it back. They'll give back to me, and I'll build on that. The circulation very much depends on mercy or grace of my audience. The most important thing is to read my audience, especially just before the show. I'm always looking at them, listening to them, trying to come to where they are."[105]

The exhibition team at the California Academy of Sciences used language that had the effect of a direct dialogue with visitors in their introduction for "Skulls." The main message for that

[105] Motoko Dworkin, interviewed by the author, February 17, 2019.

exhibit was "Every skull tells a story." The title was surrounded by 600 animal skulls, plus photographs of several key skulls that the team had identified as "heroes, so to speak." For each of those, the team wrote a short, playful blurb that read as if "**each skull was telling you a little story**." Schwarz described this text and associated design as having been a particularly successful introduction. While she notes that they didn't evaluate the temporary exhibition, they know it was "one of the most popular exhibits ever" and received "anecdotal comments about that intro being really fun."

2b.1 Introductory "stories" told in the voice of various skulls capture visitors' attention at the entrance of "Skulls" at the California Academy of Sciences.

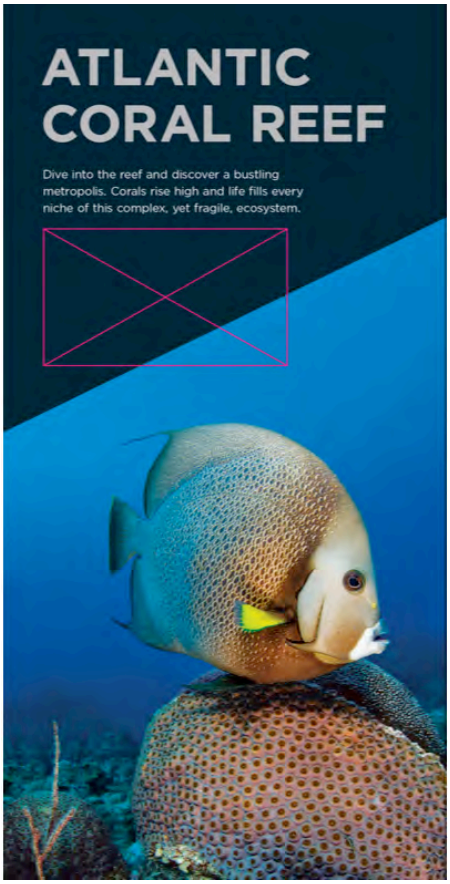
"Living West", an exhibition at History Colorado, also employed characters who **spoke directly to visitors** in an attempt to create a relatable entry experience. As visitors entered this

exhibition they encountered an A/V experience featuring three individuals who each told a story set in a different place and time. Each story introduced a major exhibit theme. These were reiterated through three large, static images and through additional captions on the screens. Documentation of this threshold reveals visitors stopping and pointing at the screens: a sign of successful planning and design. Literature in the field of narratology describes how oral narration engages audiences in a more "everyday", interactive way than written text (see p. 36).

2b.2 Three videos featuring characters from different eras of Colorado's history, combined with large images and minimal text, introduced the "Living West" exhibit at History Colorado.

3. WRITE AND DESIGN FOR WALK-BY ENGAGEMENT

Every respondent stated the criticality of keeping introductory text as brief as possible—suggested word counts ranged from 50 to 150—but several professionals described how their teams have taken this a step further by designing for what Robin Faitoute describes as a "drive-by" reading. Faitoute and her team write and design according to neurological research indicating that "**people are excited and more receptive to messaging at gallery entrances/thresholds**." She explains, "The Aquarium is a little different from other institutions. Our animals are such a huge attractor, making it difficult to hold visitors at the entrance. Text needs to be short enough for a 'drive-by' reading.'" Her team achieves this through 50-word copy blocks displayed on large pylons with a single attractive image or video. They reiterate and **expand upon the concepts introduced** in these pylons by creating several additional thresholds throughout the introduction, where they know visitors are most likely to still be paying attention. Serrell and others have studied visitor psychology at the entrance of a space (see page 11).



3.1 The National Aquarium in Baltimore combines 50-word text blocks with images and video on pylons that carry the introductory text and main messages through the gallery.

Stacey Mann's approach to the "walk-by" is informed by her work in information architecture. She says, "My work as an information architect in web design absolutely influences how I think about writing labels. I break up copy, I think of headers and sub-headers and the roles those take. Information design is everything. Big walls of text are boring." The field of information architecture has written ample literature on scannability (see page 31). Using an approach similar to that of the National Aquarium, Mann uses what she calls "**echoes**"—reinforcements of the Big Idea across multiple locations.

Additional respondents mention the effectiveness of the walk-by approach: Barbara McGrath tries to keep text short enough to be easily read "either on the move or while stopping for a very short period of time." Karen de Seve says, "To me, the most effective intro panels include a title and a single sentence that summarize the main idea of an exhibition…. I would like to

see more '**gateway**' types of integrated experiences rather than a flat label or panel. It should… **[weave] together an experience with interpretation**." At the time of this writing, independent contractor Michael Rigsby was working on a strategic plan for a natural history museum in Texas. He described his team's plans to create "a sort of [introductory] hallway with themed messages and video projections going along on the side." Rigsby adds, "That [strategy] has come up a couple times now, so that strikes me as something that might be **an approach for the future**. You're moving through the space, and not really stopping to read, but you're getting these messages through some sort of media on the way in." Eileen Campbell says, "Let's let people come in, and then they can stop**. Ideally they don't even have to stop and read—they can sort of take it in while they're walking by—and it draws you in, excites you, but doesn't slow you down.**" Another respondent describes the introduction to an exhibition about biomes. Short text clarifies what a biome is, followed by accordion panels with imagery of different habitats from around the world. The respondent believes this was successful because "you could walk by it and **at a glance**, even if you're not paying attention, you could get this idea that this is about all these different places."

3.2 "Becoming Los Angeles" at the Natural History Museum of LA County offers both a "walk-by" entry experience and options for deeper engagement. Titles of the exhibit sections are printed on banners, time-lapse photos show changes in the city over time, projected dates and text animate the floor (not shown), and more standard text is displayed just before the first gallery. Exhibit Developer Sarah Crawford says, "My goal in that space was to make it so you don't have to read intro text. I want visitors to visually understand."

3.3 Micropia, a museum of microscopic life in Amsterdam, leads visitors through the exhibit threshold with bursts of key messages in Dutch and English projected on the floor.

4. INTEGRATE TEXT WITH OBJECTS AND/OR NON-TEXT MEDIA

While the "drive-by" approach described above is perhaps an ideal variation of an introductory experience, it may not be possible for every budget or gallery size. A similar effect can be achieved through holistic integration of text, objects, and/or images. Other forms of media such as video and sound design are becoming increasingly affordable as well. Almost every individual the researcher interviewed advocated for introductions that employ some combination of these things. Visitor researcher Randi Korn asserts, "The intro label **should be visual**. There needs to be either some 3D or visual graphic to help people see something that maybe they wouldn't have noticed before. People are **totally more likely to read if there's an object**." Robin Faitoute says "both image and text should work together to support the…Big Idea." Beverly Serrell agrees that teams should "use graphics to support the content", and Page Talbott notes that "it's really key to have whatever text you have be graphically interesting. Karen de Seve says "**the best way to get people involved is to put [the text] next to an image or object**."

4.1 "Broken Bodies, Suffering Spirits" at the Mütter Museum in Philadelphia features a human skull and other intriguing objects in front of the exhibit title and quotes, and alongside more in-depth text.

For institutions with living collections, the objects in question are described to be highly engaging in and of themselves. Two respondents who have worked with aquaria express how entry experiences that pair marine life with brief text and immersive design elements quickly engage visitors on an emotional and intellectual level. Michael Rigsby recalls an exhibition he worked on at the Monterey Bay Aquarium, where visitors entered a rotunda to encounter a brief message and a "huge school of sardines" swimming overhead. Rigsby says a review referred to this introduction as being like entering the Sistine Chapel.

Tamara Schwarz related a similar success story at the CAS aquarium, but in addition to exhibiting a living collection alongside introductory text, there were other forms of media. To introduce their coral reef gallery—featuring a large, curving wall with a window for the coral

tank—the team landed on a combination of "media projection and dimensional elements along with the exhibit intro text." The media projection showed time-lapse photography magnifying the corals at various scales. Visitors were surprised by the contrast of recognizable coral reefs and the strange, magnified imagery next to them. As Schwarz describes it,

> You're seeing individual coral polyps that are moving and sort of expanding and contracting…. It's really beautiful footage; it's also kind of weird-looking. They sort of look like these weird alien creatures and you don't really know what they are. So this is **a visual composition that's really dynamic and compelling and it's something where people do tend to kind of stop as they're approaching the gallery to take [it] in**…. I think they want to know what they're seeing. So they
> will sometimes pause as they get closer to read the introductory text…. The scale
> of what you're seeing in this video is so dramatically different from what you see when you're looking at coral in an aquarium tank that I think it causes people to kind of **stop and ponder**, and it's a great way to communicate that corals are animals and not like rocks or plants or whatever else people might imagine they are.

Journalists and other storytellers describe this kind of combination of understanding and being caught off-guard as the curiosity gap (see p. 22). Notably, the other exhibition Schwarz described as having a successful introduction—"Skulls"—also combined text, images and objects in a way that brought a sense of life to the subject matter, in this case by giving it a literal voice, through short stories written as if they're being told to visitors by the animal skulls. The team who designed "Living West" at History Colorado evoked a sense of living, breathing characters through their combination of text, imagery, and what one respondent referred to as a "media experience"—the A/V installation featuring three human characters described in the

"Use Personal Language" section, above. Literature on storytelling and label-writing frequently describes the importance of establishing clear characters with goals. (See p. 41.)

Among the institutions represented in this study, Museum of Science Boston (MOS) has done the most **visitor research related to multi-media interpretive strategies**. In evaluating methods of emotional engagement for visitors of all learning styles and abilities, the researchers have found that a multi-media approach to the introduction and beyond best serves the broadest visitor base. MOS's transition toward multi-media has even **shaped their development and design process into a much more integrated model**. Speaking about their past process, Reich explains, "That division of labor wasn't effective because graphic designers often had the best ideas for how to present the label in a way that minimized the amount of words…. Now, content developers figure out through team discussions what we want to say at particular areas, and then they hand over the text to graphic designers, and the graphic designers say 'I think I can eliminate this text by adding this image.' In some cases it's like eliminating whole sections—[for example] the 'what to do' labels are able to be done graphically. We also with this process eliminated entirely the text for what to do and added small videos *showing* you what to do, and we think that'll be great for multi-lingual interpretation, as well as helping visitors with various learning disabilities and sign language."

The MOS team better understood how multi-media interpretation impacts engagement and learning through formative evaluation for an exhibit called "The Science Behind Pixar." They tested several iterations of a multi-media introduction centered around a body of text. As Reich recounts it,

> We had text, and then we added a video, or images, or a tactile piece, because we were trying to get visitors to connect the activity they were doing with the way Pixar makes movies. …None of that worked, and even when we kept to small chunks of 50 words, only 8% of visitors read. **So we flipped it, starting with a giant image from Pixar, with call-outs on that image showing how computer science changed the look of that image that was familiar from a movie. We went from 8%**

to over 40%. So it wasn't…adding images or adding tactile elements or adding videos that made a difference, it was making text the support to images that made the difference. And that really kind of flipped things for me.

4.2 MOS Boston's traveling exhibit The Science Behind Pixar features large images of familiar characters, and incorporates small text blocks to help interpret "the science behind" what visitors are already likely to be interested in.

At the time of this writing, the MOS team was working on a permanent exhibition about technologies for arctic exploration. Reich said, "rather than entry labels, we're thinking about **entry visuals**." As visitors enter the arctic exploration exhibit, they'll walk through a long corridor "with a giant ice wall that will set the stage, and tactile artifacts that [represent] technologies frequently used in the Arctic; maybe even a model of a climber on the wall just to

provide that sense of what the exhibition is all about—so, we're **doing it more visually and not just with text**."

If an Instagram presence is a legitimate indication of successful engagement, American Museum of Natural History's multi-media introduction to the exhibit "Oceans" qualifies as such. As Sasha Nemecek describes it, "There are these waves lapping at your feet when you walk in. There's this lovely **media piece**, where it looks like the waves are rolling in. On the wall in front of you is a vista looking out across the ocean. In that media piece we put **seven lines of text…in this kind of pattern**, basically like captions…. It's way shorter than other intros [at AMNH]." She hopes the institution will experiment with more immersive approaches to introductions in coming years. "Going forward, we'd like to think our exhibits are **more and more immersive**, and if that immersive experience starts at the front door, that might change the introduction," she says. ANMH took an approach similar to the Ekarv Method of writing labels with distinct lines of text, described on p. 83.

4.3 Sasha Nemecek explains that the text below was incorporated into a "media presentation" (a projection of waves lapping at the floor) and appeared line by line. Instagram videos show children rolling in the waves in pure delight.

UNSEEN OCEANS

Viewed from a sandy shore,

The ocean is a familiar presence,

Hypnotic, soothing, forever in motion.

Yet a marvelous, alien world lies hidden just beneath.

Join us on a journey to explore that world,

From the sunlit surface to the inky depths,

to experience an ocean you never imagined.

Regarding the feasibility of multi-media introductory experiences, Page Talbott notes, "many museums…these days will practically bypass intro text altogether and do a surrogate thing like a video or another experience…I think it's successful but very expensive." Laura Allen adds that "**for 'permanent' galleries, digital tools make less sense** as they are less likely to be maintained over the lifetime of the hall, and so are often avoided." In comparison, Christine Reich is hopeful that "as small screens become cheaper, as video production and audio become

cheaper, [the field] will move toward multi-modal ways of interpretation." She says, "Not only are our labels not widely read; there are **many groups for whom text is just inaccessible**: for someone who is blind, or born deaf, or for whom English is a second language; for early learners, for visitors with intellectual disabilities." When posed the question "In what ways do you foresee introductory texts for exhibitions changing over the next few years?", two additional respondents mentioned the probability of increased multi-media introductions, and one wondered, "**Will there even be written labels?** Or will audio and video be the methodology?"

5. PROTOTYPE / CONDUCT FORMATIVE EVALUATION

When posed the question "Do you prototype and/or conduct front-end and/or formative evaluation when creating intro text? If so, what is your approach?", respondents commonly noted that while it is very valuable to prototype it's not always possible, particularly for contract positions. Likewise, in response to the question "Expound on your greatest success in writing and displaying intro texts that attract, engage, and orient many different kinds of visitors. How do you know the introductory text worked for these visitors?" many respondents expressed that they had a difficult time answering this, because **formal evaluation has rarely if ever been part of the process** of crafting introductory text. Karen de Seve says "The only way to know [if text has been successful] is to test and evaluate it. Often [one] doesn't get to."

Many interviewees did discuss situations in which their team—or individuals from other departments in their museums—have conducted less formal prototypes with visitors on the floor. One respondent notes that when possible, it is beneficial to "mock up intro text really quickly and take it out; show it to people." They add, "Any information like that really informs the process. The question of who the audience is really informs the whole thing, and particularly the intro text." Respondents cited several benefits of this kind of "**quick and dirty**" mock-up, including: gaining a better understanding of visitors' questions and misconceptions; determining the best location for the text; determining effectiveness for specific audiences; and deciding on combinations of text and non-text media. Three respondents also mentioned

prototyping being a successful means of getting team buy-in to best practices; namely, reducing word count.

In regards to **understanding common questions** through prototyping, Laura Allen gives this example: "The hall I'm working freelance on has historic dioramas of state mammals in it. Some of the animals have been extirpated from the state, however, and visitor testing showed that they were immediately visually confusing [e.g. a bison in Pennsylvania]. So my label draft will include this aspect." About determining the best location, Beverly Serrell says "the actual installation location should be user-tested for the best spot."

Christine Reich stressed the importance of "being **explicit about who that intro text is for** and not for…. Will teachers know how this exhibition connects to the curriculum? Because it's often through the intro text that they figure that out. Or, do older adults realize that intro text orients them properly to what's in the exhibition so they know where they want to go?" (Related to this second example, Reich cited research indicating that **older adults are more likely than other visitors to seek out introductions** as a means of orientation.) In reference to the benefit of prototyping and evaluation in general, one respondent says "I can sit there and write something pithy and poetic and fabulous, but I'm not my own audience. It's for someone else."

Reich also described the impact of formative prototyping on the decision to combine text and non-text media in certain ways. In testing signage for their "Science Behind Pixar" exhibition they determined that "**making the text the support to images**" led to more visitor engagement than the other way around.

Finally, the most frequently agreed-upon benefit of prototyping introductory text is its influence on **curatorial buy-in**. Three respondents made similar remarks about this, i.e. "We've been able to convince curators through prototyping that less is more, simpler is better" and, "Testing things out on visitors tends to be the best way to get curators to change their mind. To watch people's eyes glaze over or hear them say they don't care, that works." Another

respondent told an anecdote about a curator who was also doing the writing. He took the draft onto the floor himself, and was surprised at the lack of interested readers. He cut his text from 200 to around 120 words. Jessica Bicknell noted that in doing summative evaluations it becomes clear when someone has read the introductory text, because their response will be similar to the text.

Visitor Researchers' Approaches to evaluating label effectiveness

Respondents to the Visitor Researcher/Evaluator interview named a variety of methodologies they have used for evaluating effectiveness of labels during formative evaluation. A summary of their methodologies follows:

- **Methodologies:** In-depth interviews with adult walk-in visitors, who were shown drafts of text and mock-ups of exhibition materials made by a professional design studio.
    - **Exhibit:** "Americans": a permanent exhibition at the National Museum of the American Indian in Washington, D.C.
    - **Evaluation goals:** to understand how the tone of exhibit materials resonated with visitors (i.e., seeking to make visitors curious and open-minded versus feeling talked down to.)
    - **How labels were changed as a result:** All labels tested (and many that were not) were edited to strike the right tone with visitors and best communicate the thesis of the exhibition.

- **Methodologies:** A combination of observation, interview, survey, and a card-sort activity.
    - **Exhibit:** "Tech Studio" at MOS Boston.
    - **Evaluation goals:** Learn: To what extent do visitors create solutions using engineering skills of iteration, creative thinking, and problem decomposition? To what extent do visitors recognize that they used these three skills, that engineers and computer scientists use them, and that they can be used to solve a wide variety of problems? To what extent do visitors recognize and experience the creativity that is part of the work of engineering and computer science?
    - **How labels were changed as a result:** Text-heavy labels were changed to text-free video "labels" that show film clips of the exhibits in use. Language in text labels was significantly shortened.

- **Methodologies:** Stand-alone prototyping of exhibits and their labels.
    - **Exhibit:** The Science Behind Pixar at MOS Boston.
    - **Evaluation goals:** Learn: Are visitors noticing that the labels are affiliated with the exhibit? Are visitors reading the labels? How much time are visitors spending reading labels? Are visitors understanding the instructions or content from the labels?
    - **How labels were changed as a result:** The label strategy changed a lot: paragraphs of text were changed to highly visual labels with call-outs of text with exhibit content. Instruction labels included large step-by-step numbers and pictures to diagram the instructions.

- **Methodologies:** Collecting post-it responses on large comment boards, having visitors circle parts of black and white images on artwork they were curious about or didn't understand. Also, interviewing visitors about how they were understanding objects and artwork in the exhibition, and A/B testing with specific object labels to understand which worked well and why.
    - **Exhibit:** We Move And We Stay, Science Museum of Minnesota.
    - **Evaluation goals:** Make sure the labels honor both Western science and native ways of knowing, in addition to providing contextual information about some of the more potentially controversial artwork in the exhibition. Understand if prompts could lead to better engagement.
    - **How labels were changed as a result:** The evaluation supported the team in continuing to wrestle with how they wanted to present the items. The way the painting was presented was changed. The evidence from prompt boards indicated how visitors were connecting to the exhibition, some things they still wanted to see, and how they were understanding some key aspects of the exhibition. One example of our evaluation data supporting changes made in the exhibition is related to the prompt boards. The team wanted to know if visitors (who were predominantly non-native) understood after seeing the exhibit that Native Americans are part of an active culture today—not something from the past. To find out more about this, the team created a prompt board that asked visitors to suggest names for the new exhibition after seeing it. **Many post-its from the early prototype version of the exhibition said things like "ancient peoples" or "in the past," etc. As the team made changes, this language placing Native Americans in the past became less prevalent.**

Chapter 5: Application

Prototyping introductory signage at the Saint Louis Science Center

This researcher applied her findings toward revisions of introductory signage for an exhibition about soils, called "All-American Soils", at the Saint Louis Science Center. The in-house exhibit team wanted to revise the graphic hierarchy and messaging of the exhibit to create stronger visual and conceptual connections between an interactive about soil cores and soil layers, and an adjacent display featuring vitrines of different soils from the 50 states and territories. Several existing conditions of the gallery had been identified as problematic:

- Inconsistencies in visuals and messaging
    - Soil was represented very realistically in the vitrines, and very simplistically (cartoonish) in the soil core interactives.
    - While the Big Idea and learning objectives described below focused on agriculture, the existing interpretation around soil was much more general.
- Interactives needed physical and interpretive revisions
    - The soil cores were loud, clunky, and hard to pull out and examine.
    - The word count on the associated labels was somewhat long and at a reading level higher than most visitors observed using the interactives (families with kids aged 2-7). Again, the label text interpreted the various soils but did not make explicit connections to agriculture.
- No clear title or text delineating this space as a special, soil-themed area

The team had received a grant for making revisions, and with several new people on staff focusing on soil science and content development (including this researcher), it was in the institution's scope to prototype and adjust accordingly.

A sense of the space

5.1 "All-American Soils" consists of a row of cases full of soils from every state. It is installed at the back of an agriculture-themed exhibit building called GROW. Next to these cases are two giant maps of Missouri and Illinois. (Pictured here is the Missouri map, at right.) They feature interactive soil cores that kids can pull up and examine.

5.2 Interactive maps and existing signage about soil layers (far left.) In this photo the reader rail on the sign has been covered by a print with revised text and graphics. Also pictured here is one of three entrances to this space. Another is directly across from this, and the third is on the wall opposite this curved wooden wall.

5.3 A few state soils on back wall of GROW.

Big Idea (for overall GROW building) and Objectives

- Big Idea:
    - All of us play a role in the stewardship of food supply, today and in the future.
- Primary Objective:
    - Demonstrate soil varieties
    - Demonstrate that different soils are used to grow different crops
- Secondary Objectives:
    - Soils have different colors
        - Causes: Minerals, Organic Matter, Wet/Dry, etc.
    - Soils have horizons (layers)
    - Soils differ regionally
- Additional Objectives:

- Soils have parents and formed in different ways
- Over 500 different soils in Missouri; over 500 in Illinois

The goals for this researcher's participation in the project included:

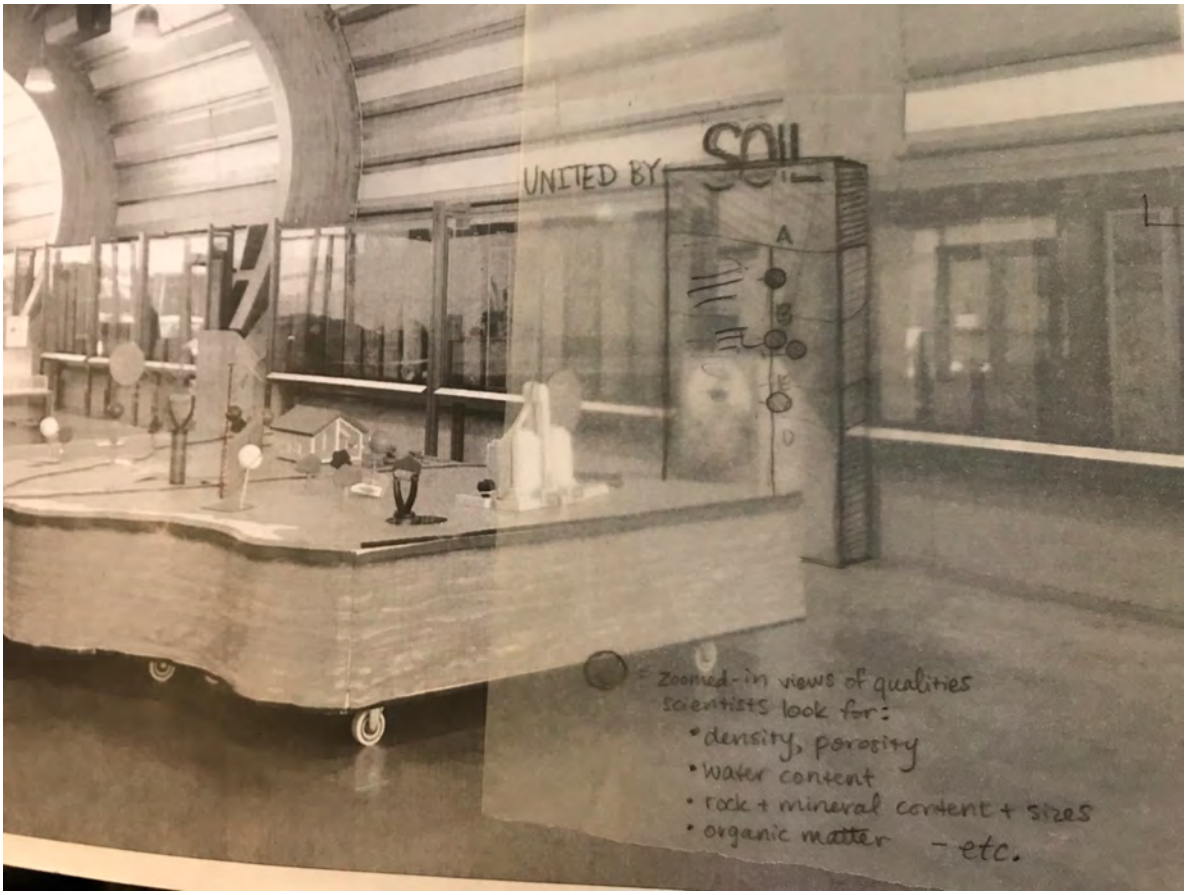
- Prototype an altered, augmented version of existing exhibit introductory signage — titled "Option A"—to evaluate whether the changed configuration engages visitors and orients them toward key concepts for both the state soil cases and the soil core interactives.
- Prototype drafts of a new signage system signage — "Option B"— to compare visitor responses between this configuration and the above, and (again) to evaluate whether the configuration engages visitors and provides conceptual orientation.
- Make recommendations for text and design for this exhibit.

Process (See appendix F for a more detailed overview of this process)

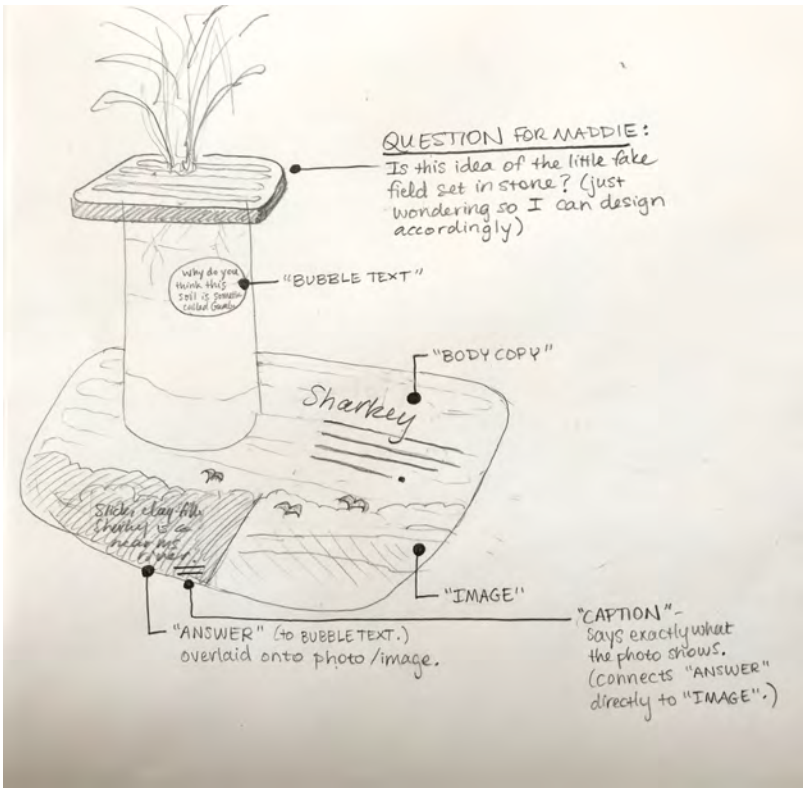
This researcher took the following steps to work with the team to write and display introductory signage for the soils exhibit:

- Read existing exhibit development documents, including an interpretive plan written by an outside firm several years prior.
- Met with the team several times to understand perceived issues and desired changes. The team's priorities were to more clearly interpret the significance of soils' layers in various areas of the exhibit; to highlight that certain soils are conducive to growing specific local crops; to clarify the purpose of a soil core through text and design; and to streamline the look and feel of the experiences in the exhibit.
- Worked with an educator and a soil scientist to devise a graphic system to accompany the soil core interactives. Worked backwards from the system to consider how introductory signage would introduce that comparatively content-heavy area.
- Condensed existing text throughout the exhibit into two options for a new system of introductory signage. Both options included a large exhibit title, a large introductory graphic panel, and new text and graphics added to the state soil cases.
- Shared these suggestions with the team by e-mailing a pdf of sketches and graphic drafts; requested feedback. Adjusted accordingly.
- Printed and pinned up full-sized black and white drafts of signage to test size and readability. Adjusted accordingly.
- Worked with fabricators to install each of the two systems consecutively; one on a Friday and one on a Sunday.

- **Worked with visitor researcher Sara Davis** to create an evaluation instrument (see Appendix G) to assess how successful each option was in engaging visitors and in orienting them to the relevant concepts and experiences of the soil core interactives and state soil cases.



5.4 Sketch for working out and communicating ideas for new signage (and a new proposed exhibit title—"United By Soil"—but it was later determined that the originally planned title needed to stay.)



5.5 Sketch for communicating proposed graphic system for soil core interactives. The system changed slightly after further conversations (the question and answer were flipped, with the answer revealed as visitors raise up the core). However the basis of the "question and answer" concept was devised by team leaders and was non-negotiable.

5.6 The team wanted to prototype new versions of this soil core interactive along with the new introductory signage options. The interactive allows visitors to move a lever to see the core emerge, layer by layer.

THE PROTOTYPING SESSIONS

"Option A" was prototyped on Friday, March 29, 2019 from 10:00am-2:00pm. Option A consisted of a graphic system with the following components, all of which this researcher designed and had approved by the team and printed:

- The title "ALL-AMERICAN SOILS" and subtext "*Find your home Earth*" (both non-negotiable) printed on an in-house large-format printer, mounted on foam-core, and installed on top of the row of soil cases at the back of GROW.
- A revised version of an existing sign
- Text interpreting a key layer of the Missouri state soil case. The text was vinyl-cut and installed on a piece of plexi-glass that was affixed to the glass case. The purpose was to provide a concrete example of one soil's layer structure, and to test out the idea of installing additional text on other cases later on so that visitors can compare the layers in various soil types.

Prototyping 'Option A'

5.7 The existing reader rail was covered with a new graphic (and a placeholder image representing an artifact case for a real soil core), a mock-up of a floor treatment added for visual interest and to break up messaging, and illustrations added to the soil layers to connect the text to visuals of what scientists look for in a core.

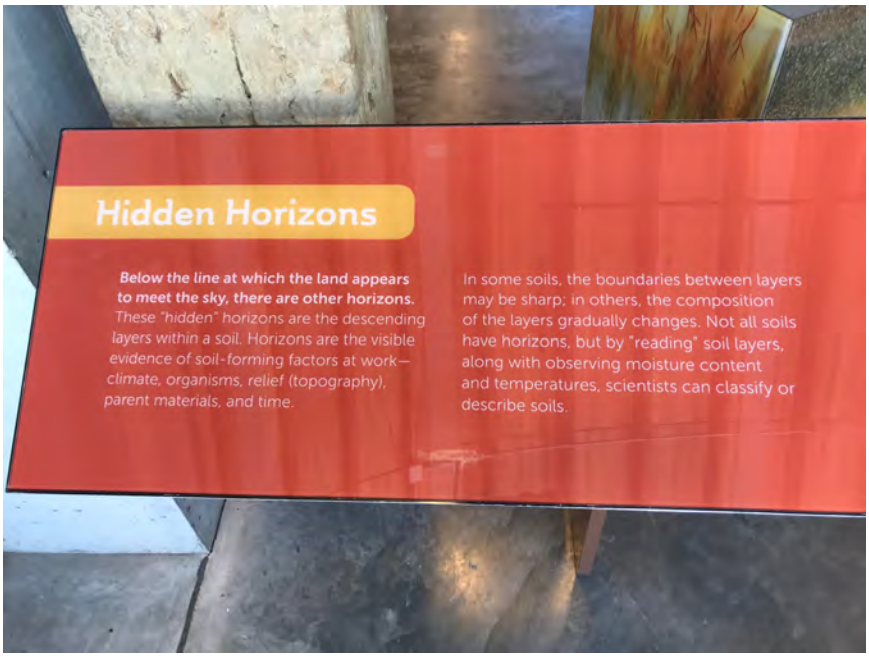
Prototyping 'Option A' (continued)

Title and new interpretation on soil vitrines

5.8 Prototypes of title. This helped the team consider future font choice and sizing.

Prototyping 'Option A' (continued)
details of revisions to existing signage

5.9 This researcher made draft illustrations showing what scientists look for in each layer when planning crop management. The concept of the illustrations is described in revised text on the reader rail, and the existing description of each layer (on the yellow and red sign to right of soil column) was left the same for broader context of the layers.



5.10 The existing reader rail text describes the diversity of horizons (layers) in different soils; the biological processes in each layer; and how scientists can observe layers to classify soils. The goal of Option A was to reduce word count and make the text more directly relate to what scientists look for in soil layers for purposes of crop management specifically.

"Option B" was prototyped on Sunday, March 31, 2019 from 10:00am-2:00pm. Option B consisted of a graphic system with the following components, all of which this researcher designed and had approved by the team and printed:

- The title "ALL-AMERICAN SOILS" and subtext "*Find your home earth*" printed and installed as described for "Option A". The word "SOILS" flowed visually from the words atop the soil case, into the large introductory sign, and was designed to give an impression of being "planted" at the top of the sign.
- An entirely new (proposed) graphic. The gray area of the graphic would ultimately be made of concrete and would be installed atop an existing concrete structure (not visible here; it is behind this sign.) The negative space allows for a potted plant or an educational cart to be placed in front of the sign. Educators work regularly in this space and interpret the exhibits in a variety of ways.
- Text interpreting a key layer of the Missouri state soil case. The text was vinyl-cut and installed on a piece of plexi-glass that was affixed to the glass case. The purpose was to provide a concrete example of one soil's layer structure, and to test out the idea of installing additional text on other cases later on so that visitors can compare the layers in various soil types.

Prototyping 'Option B'

Title and introductory sign

5.11 Title, introductory sign with floor treatment, and proposed artifact (an actual soil core) represented by smaller white rectangular print on right side of sign.

5.12 The word "SOILS" was designed to flow visually from the words "ALL-AMERICAN", and to appear as if "planted" at the top of the graphic.

5.13 Here you can see the concrete structure behind the prototype.
A final version could recess the sign further back, situating it atop the existing structure and integrating it more seamlessly into the architecture.

How "Option A" and "Option B" applied thesis findings

- The text attempts to **engage visitors on a personal level** through words like "us" and "we," i.e. "Soil cores tell us which crops can grow where." The content about what scientists look for in soil layers is **posed in the form of questions** in order to prompt inquiry in visitors.
- Even if visitors are **quickly walking by**, the visuals and headings quickly convey that soil layers are important to look at to know which crops can grow where. Between the exhibit title, the text on the large sign, and additional text on the soil cases, key messages are consistent with each other but are broken up throughout the physical space so as not to overwhelm.
- Both designs incorporate **visuals** (illustrations of magnified views of soil layers) and a proposal for an **object** (an actual soil core) in keeping with the known importance of combining text with objects and visuals.
- A floor treatment features "big-picture" messaging about the diversity and importance of soil. The **unusual placement of text** is intended to surprise visitors, in keeping with this study's findings about surprise as an attractor.
- The design and materials used for the **prototyping** session were intended to be just "finished-looking" enough to be attractive, but also unfinished enough to help visitors (and staff) understand that this was just a test. This worked to some extent.

Prototyping Methodology

SLSC Visitor Researcher Sara Davis worked with this researcher to design a survey instrument. The purpose was to evaluate the effectiveness of Option A and Option B in engaging visitors and in setting them up to better understand the concepts of the state soil cases and the soil core interactives. Questions were open-ended in order to allow for complete flexibility in visitor responses, and the instrument was designed for 10-minute surveying sessions. The researchers approached groups of visitors that included adults as they entered the most commonly-used entrance of GROW, and Davis surveyed the visitors while this researcher took notes.

Still standing near the entrance, across the room from the soil-related area, visitors were asked to give their overall impression of what stood out about that area. Then they were instructed to take as much or as little time as they wanted to look at the section of the area containing the introductory signage. The visitors were told that the researchers would stand by and would

pick back up with the survey questions when the visitors were ready. Next, Davis asked the visitors some more specific questions: about what was standing out; about "big messages" that the designers might be trying to convey; and about the perceived meaning of the large letters demarcating the soil layers.

Finally, visitors were brought over to the soil core interactives and asked to interact with the prototype and look at the associated label. Here, visitors were asked what the designers were trying to convey, and they were asked to draw comparisons between messages in this area versus messages in the introductory area. After a few more specific questions about what visitors were learning about soil and plants, they were asked if they had any advice for the designers. Then they were thanked and given a small gift (a clip for chip bags, which is what happened to be available.)

Limitations

- It was determined that attraction rate would not be evaluated, in part due to the already time-consuming process of surveying each visitor group, and in part because the designs were not finished-looking enough to gather realistic data about the attractiveness of the graphics.
- With more time, more design details could have been refined, such as the alignment of the title for "Option B" and alternative uses of color to attract visitors.
- Several aspects of the text and design throughout this area were decided upon by other team members (such as the decision to label the interactive soil cores with very specific sub-layers: A1, A2, etc., while elsewhere in the exhibit the soil layers were not labeled with such detail).
- The sample size for both "Option A" and "Option B" testing was only six due to time constraints, but there was enough consistency in visitor responses that six seemed sufficient.
- The very open floor plan and the fact that there are multiple entrances to GROW made the soil-themed exhibit area a unique challenge to introduce or to distinguish from the rest of the space, particularly without an existing wayfinding or graphic system already in place.

Findings for "Option A" vs. "Option B"

After greeting visitors, they were ***asked to spend some time looking at the section of the soil-themed area containing the relevant signage***. The researchers took notes on what the visitors did and said during these few minutes. In the case of both Option A and Option B, visitor groups tended to be more attracted to the cases of soil than the signage itself, and as they looked at the cases they made comments about the variety of soils ("it's about what soils look like in different states" and the colors (parents asked kids what colors certain states' soils were; many visitors commented on the bright red Alabama soil).

When the researchers asked about Option A, ***"What was your initial impression of this area? What popped out at you?"***, two groups mentioned **layers** (one in response to the introductory sign; one in response to the Vermont soil case); three mentioned **variety** ("I connect it to people and all the different states they're from", "States—that's cool, it's different with each state; it's like 'what's it like in your state'…") and one mentioned the fact that **different soils are conducive to growing different things**. In response to the same question during Option B testing, two groups mentioned **layers**: "I like the layers; the different minerals in different sections", "soils start one color and change as they go down". Five groups of visitors mentioned **variety** ("how different each one is", "there's a lotta different dirt", "19,000 kinds…whaat?"). And two mentioned the fact that **different soils are conducive to growing different things**: "All soils are different and can grow different things", "it's about what grows the best crops".

It is worth pointing out that during testing of Option B, the researchers began to direct visitors more specifically to the sign because otherwise they tended to focus more on the wall of soil cases.

The researchers moved on to questions about Big Ideas, asking: "***If I said this area was trying to communicate a big message about soil, what would you say that message is?***". During Option A testing, five groups said it was all about **variety**, suggesting "big messages" like "Soil

is very different depending on where you are", "There's a wide variety of soils", and "The differences in different areas". Two of these groups also mentioned **layers**: "Sometimes the top part is darker, or dryer at the bottom like Alaska…", "It gets more interesting as you go down deeper; more texture", and one group said the message was about **different soils being conducive to growing different plants**: "Yeah, we're farmers, so it's all 'in this area you grow this kind of stuff'—so soil makes a difference". During Option B testing, three groups mentioned **variety**: "It's all part of one big group, but then it's diverse…as diverse as people, right?", "I didn't know there was such a difference in all the soils", "There's a large variety". Two groups said the "big message" was about **different soils being conducive to growing different plants**: "It's about figuring out the best crops to use", "insight into what grows in what areas, what it takes to support growth in different layers". Two visitors weren't sure what to say for Option B, whereas for Option A everyone had an answer.

Next, the researchers asked about expectations after seeing this content: "***If this was the start of a larger exhibition about soil, what would you expect to do, see, or learn?***". For Option A, four of the six groups wanted to know more about **how soils are good for growing and doing different kinds of things**. One said, "You could have panels on different sides—one goes more into gardening, one to agriculture, and the differences in the soil show what you can do in different parts of the country." Another (who happened to be a soil scientist) suggested first learning about layers in general and then applying that knowledge to a section about the layers in specific regions, i.e. "the layers in plains states soils have a lot of *x, y, z*…". Other interests included learning more about soil organisms, an interactive featuring the layers, and tying the content to history. During Option B testing, again, four groups wanted to learn more about **how soils are good for growing and doing different kinds of things**. They wanted to "see what grows better in what soil" and "see the change from one state to the next", and to "learn what different soils have to offer—what's underneath, what plants grow where". Three visitors wanted to **feel** actual dirt.

When asked what the large letters on the introductory sign were about during Option A testing, three groups knew that they were meant to delineate the layers, and three groups didn't really know. During Option B testing, four didn't really know and two knew it had to do with layers.

The researchers then guided the visitors over to the soil core interactives and took notes on what the visitors were inclined to do before asking, "What do you think the designers hoped to get across with this exhibit?" During Option A testing, three of the groups said the point was to make the concepts **interactive**. Two implied that it was about **describing a specific kind of soil**, noticing the text on the soil core about Sharkey soil being slick like gumbo stew. Another said the point was to show the **layers** and explain that **different crops grow well in different kinds of soils**. During Option B testing, two groups said the designers wanted to make the concepts **interactive** and mentioned liking the tactile aspect of it. Three groups said the designers wanted to emphasize the importance of **layers**: "If you dig far enough, there are still different layers, textures, and different things in it". Another said it was about "**why farmers plug their soil**, for rice in general" and a final mentioned **variety**, saying it was about "all the different types and layers of dirt".

The visitors were then prompted to ***make connections between this interactive and the introductory area with the soil cases and large signage***. For Option A three groups reiterated concepts about **variety** and **different soils being conducive for growing different things**: "this is one specific location after getting all the different locations [with the soil cases]. Different crops grow in different soils better than others", "Which soil is best for which crops—real dark soil more-so than clay", "the core is about plants and what they need from soil—this one's about really WET soil; that wouldn't happen in Utah". Three groups said that the **labeling of the layers was inconsistent** between the two areas: "This core has A1 and A2, and it doesn't have that over there. And this one has no E layer—so an explanation about that would be good." For Option B, two groups mentioned similarities in messaging about **different soils being conducive for growing different things**: "How they use different soil to harvest different crops",

"how things are grown most effectively and efficiently". Two groups described the interactive area as being **a more local-themed, specific example** of the soil-related content conveyed in the introductory area. A girl around 11 years old said, "It's taking what you saw over there and seeing it 'come to life' here, so to speak." Another visitor said, "that wall gives a more in-depth overview; this is short and sweet. I prefer the Cliffs Notes version." One group noticed that the **labeling of the layers was inconsistent**.

Finally, visitors were asked if they had ***any suggestions for the designers***. For Option A Every suggestion was different, ranging from a desire to have **more soil organisms** on the interactive, to **fixing the inconsistent label layering** described above, to wanting more content on **what plants get out of the soil**. During Option B testing, two groups suggested adding more about **what soils are conducive for growing different plants**, another wanted more **touchables**, and another wanted to **fix the inconsistent layer labeling**.

Conclusions and recommendations for final production

Overwhelmingly, visitors were drawn to the wall featuring cases of soils from every state when they first entered GROW. They were struck by the variety and colors, and regularly made connections between the diversity of soils and the diversity of people and regions. Somewhat less regularly, before moving any further or before necessarily looking at the signage, visitors mentioned noticing layers of soil and described them in terms of "gradients" and "changes from top to bottom". After exploring the introductory area in the case of both Option A and Option B, visitor expectations and interests revolved heavily around wanting to learn more about what grows best in which areas. They recognized this as an existing theme slightly more often during testing of Option B, especially when the researchers prompted visitors to look more specifically at the large signage and not just at the area in general.

Because visitors are already so intrigued by the wall of soil cases, and because they tended to bypass the large signage unless prompted to look at it, a solution for providing additional interpretation about connections between soils and crop management could be to add text

and graphics to some of the soil cases, as had been planned by the group before this prototyping session. **This solution would be in keeping with findings in this study that attraction and engagement is often more successful when appealing visual elements are the primary attractor with written interpretation acting as a supplement.** In addition to adding text to the cases to highlight specific layers in various state soils as was already planned, small colored graphics of plants could be used to show which plants grow well due to the called-out attributes of that soil. One caveat is that text and graphics may cause some degree of "visual pollution," interfering with the visual appeal of the existing display. This might be ameliorated to some extent with frosted/translucent vinyl rather than stark white.

However this idea of **adding interpretive text to describe individual layers of individual soil types would leave out a comprehensive overview of soil layers in general**, meaning that visitors would not necessarily gain a holistic, general understanding of biological and chemical processes throughout soils' layers, and how those processes impact life and growth above ground. This idea would also leave out interpretation about soil *cores* specifically—about what they are and how farmers use them for crop management. If these are still considered to be important messages, further design iterations could be tested using the existing graphic component of "Option A" (the existing model of soil layers with signage attached) as a basis for conveying these messages. This would save time and money (rather than starting from scratch with a new graphic). The team agrees that repurposing the existing graphic would be the most efficient way to move forward.

It is possible that the large signage prototyped in both "Option A" and "Option B" did not stand out enough from the surroundings, i.e. did not violate visitors' schemas or serve as enough of an element of surprise as described in this study, to capture their attention. Further design development could test more visually striking options, experimenting further with unusual type treatment linking the exhibit title physically to the signage, incorporating touchable or other sensory elements into the sign since many visitors expressed interest in this, or coordinating with GROW educators to consider how interchangeable components could be

added to the sign to connect with lesson plans (like a "Missouri Soil of the Month" addition, or a magnified swatch of real soil, or a live cam of soil organisms outside, or a "sniffable" component, or a piece expanding on how minerals impact soil coloration since many visitors were interested in this, or a photo and soil core related to the work of a local farmer since this study has found human interest stories to be a way to engage audiences with science).

Many survey respondents mentioned inconsistencies between the labeling of soil layers throughout the exhibit. This would be a relatively simple thing to resolve before final production of the soil core interactives. Visitors did not understand the meaning of each soil layer's demarcating letter. Further testing could be done to assess how brief definitions or descriptions of the full scientific words these letters stand for help clarify that concept.

Based on findings of this study and on observations of the amount of text visitors in this exhibit tend to read, this researcher recommends further development of text and graphics to replace the text-heavy reader rail covered up for prototyping in "Option A". Variations of text and color schemes could be printed out and evaluated with a small sample size of visitors to determine the strongest configuration for conveying what scientists look for in a soil's layers. This work would fall under this researcher's position at SLSC.

The illustrations of magnified views of soil layers also require further refinement in terms of scientific accuracy and visual appeal (this researcher created draft illustrations for the sake of efficiency). Visitors were instantly attracted to the illuminated text bubble on the soil core interactives because it stood out visually. Similarly, the illustrations on the introductory signage could be illuminated when visitors push corresponding buttons on the reader rail. This solution would be in keeping with many survey respondents' interest in interactives and it would reinforce the concept of hidden interactions underground, revealed through investigation.

The soil column component of the existing sign could be made more visually attractive and more realistic with a refined paint job, which this researcher would be able to accommodate.

Another layer of visual interest could be added with further development of the floor treatment concept already tested. More colorful text and shorter messaging on the floor might increase the attraction rate to this element (though several visitors were observed reading and intentionally standing on the floor treatment.)

Chapter 6: Conclusions and Further Research

This study addresses the issue of low engagement with introductory text at many institutions. Through a synthesis of five areas of literature, an analysis of best practices in the museum field, anecdotal case studies from storytellers in other fields, and an analysis of findings from an introductory signage prototyping session at the Saint Louis Science Center, this study shows how exhibition teams can prototype, write and display introductory texts that attract, engage, and orient more of their visitors. Exhibit teams can refer to the best practices outlined in this study and to the research/literature consolidated in Chapter 2—including the psychology of attention, methods and psychology of engagement, design strategies for attention-capture and engagement, label-writing, and storytelling—to develop a collaborative process, strategies, and guidelines for creating introductory texts at their institution.

Exhibit teams may also glean insight from the description of an introductory signage prototyping session that applied the findings in this study to an exhibit at the Saint Louis Science Center (Chapter 5). This researcher worked with a team to write and design text and visuals to introduce an exhibit about soils and agriculture. Visitor engagement and conceptual orientation in response to two introductory options were measured through loose analysis of responses to an open-ended survey. Findings indicated that visitors were initially attracted to the visuals surrounding the introductory signage (a wall of cases full of various soils); that visitors expressed interest in learning more about what soils are good for growing various crops as they engaged with both the introduction and surrounding exhibit elements, and that the signage and surrounding exhibit elements helped visitors easily gain a basic sense of the intended key concepts related to soil science.

Following are key takeaways from this study:

- Introductory text should be fast, easy, and appealing to read. Leading experts in the field recommend a 50-100 word count (or less).

- Breaking up introductory text throughout the entire exhibit threshold makes it easier to take in, offers opportunities for reinforcement of themes, and allows visitors to enter the space at their own pace.
- Text that is displayed in unusual ways surprises visitors, piques their curiosity, delights and amuses them, and draws them in for more.
- Text that is written in unusual ways—from the voice of an unexpected character, or in the form of a poem for example—will likewise surprise and intrigue more visitors.
- Incorporating an object, image, or other form of sensory input into the text is a well-tested, easy win.
- A collaborative effort between writers, editors, designers, lighting designers, fabricators, and potentially even visitors will yield the most unique and fully-considered results.
- Prototyping is key for this critical anomaly of an exhibit element.

Further Research:

An entire thesis could be written on any of the following topics:

- The Curiosity Gap
  - How can exhibit teams find out what their visitors do and don't expect, and then create and bridge the "curiosity gap" effectively?
- Asking questions in labels
  - How can exhibit teams find out what questions visitors are already asking, and then pose them effectively?
- Getting the Big Idea from the beginning of an exhibit without reading
  - Is it possible? How to write and design to make it work?
- Visitor psychology in exhibit thresholds
  - What are common expectations, needs, and emotions at exhibit thresholds, and how can they be addressed through exhibit design?
- Emerging technologies
  - How can new technologies like virtual reality be leveraged to attract and engage visitors at exhibit thresholds? What are options for making these affordable?

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Appendices: see attachment for A-H

Appendix I: GLOSSARY

Advance Organizer: A term from educational theory. In classroom settings this tool helps teachers present information so that students will better understand and remember it. It can introduce the lesson topic and illustrate the relationship between what students are about to learn and the information they have already learned.

Attraction Power: The extent to which an exhibit element attracts visitors for any amount of time.

Big Idea: A sentence that provides an unambiguous focus for the exhibit team throughout the exhibit development process by clearly stating in one noncompound sentence the scope and purpose of an exhibition.

Conceptual Orientation: A system of exhibit elements that help visitors become aware of concepts to be explored in an exhibition.

Exhibit Threshold: The physical and conceptual entrance area of an exhibition.

Front-end evaluation: A process designed to understand what visitors want to learn or experience in an exhibition, done at the beginning of a project.

Introductory Text: Text and associated visual elements that introduce an entire exhibition.

Media: Any tool used to store and deliver information or data.

Narrative: a way of presenting or understanding a situation or series of events that reflects and promotes a particular point of view or set of values

Narratology: the branch of knowledge or literary criticism that deals with the structure and function of narrative and its themes, conventions, and symbols.

Prototype: a first, typical or preliminary model of something from which other forms are developed or copied. (A noun and a verb)

Schema: a cognitive framework or concept that helps organize and interpret information.

Story: A series of events and actions undertaken by a character who faces some kind of challenge or obstacle.

Sticky Idea: An idea that is simple, unexpected, concrete, credible, emotional, and employs stories.

Appendix A: Initial E-mail Interviews

Interviews with Exhibit Developers, conducted via e-mail for initial thesis inquiry during Summer 2018

Name	1) What are the main goals/visitor outcomes you have in mind when writing introductory labels for exhibitions?	2) What are the biggest challenges you face when writing introductory labels for exhibitions?	3) In what ways do you foresee introductory labels for exhibitions changing over the next few years? (This can include both the act of creating them and the way they're used.)
Jane E. Boyd	The ideal introductory label should accomplish many things: 1) Stop the visitor in their tracks and entice them to read it (design is important here as well). 2) Invite the visitor to come inside and experience the exhibition. 3) State the big idea of the exhibtiion clearly and succinctly. (The title of the exhibition is part of this; if the title doesn't support the big idea, it should be changed.) 4) Signpost the major topics or sections of the exhibit, so visitors know what they'll be encountering. 5) And perhaps pose a question for visitors to think about as they move through the exhibition. Overall, the intro label should be an invitation, a conversation, and perhaps even a provocation. And it should do this in as few words as possible — quite a challenge!	1) Trying to accomplish all of the above at once. 2) Resisting the urge (often from subject matter experts) to cram in as much content as possible. Simpler is better. 3) Making the intro label accessible, inviting, and appealing to all audiences.	1) I would like all institutions — especially art museums — to move away from the "paragraphs on the wall" model of introductory labels. No one wants to do "homework" before they can get to the good stuff. 2) I would hope that designers and developers (and subject matter experts, and educators, and frontline staff) would work together to reevaluate the effectiveness of their current entryway/introductory experiences (not just the labels). Collaborating to figure out the best strategies, and putting visitors first, will yield the best outcomes. 3) Related to the previous item: I would want everyone involved in creating an exhibit to really pay attention to the threshhold/entry/intro experience, instead of leaving it until the end or having it be an afterthought. I think people are sometimes reluctant to "give away" too much at the beginning of an exhibition, especially when time and budgets are tight, but a great entry experience doesn't have to cost a lot of money. And I think the entry experience should be enticing and entertaining AND content-rich and thought-provoking at the same time — just like the entire exhibition should be.
Judy Rand	Every label upholds the overall goals for the exhibition (I do a goal-setting workshop with the team to help them set priorities, to find their 'top 10 goals' or '6 major goals.') Different teams set different goals, but they nearly always include 'Make every label simple, clear, direct...' and 'Anticipate and answer visitors' questions.' Note: I can speak to intro panels for just about every kind of exhibition...aquariums, zoos, nature centers, history museums, natural history museums...but NOT art museums. Art museums are different in the way they share (or don't share) written interpretation throughout the exhibition...visitors know that and behave a bit differently. (Someone said art museum visitors are more likely to stop and read some if not most of the big long intro panel at the beginning...because they know they're not going to get much (or any!) written interpretation after that! I create/develop a label 'taxonomy' (hierarchy) that lists/outlines/describes each type of label in the system, from 'intro panel' down to caption. I describe the function (purpose), format, relative importance and degree of desired access for the audience. Sometimes I use a one-sheet to describe the 'purpose' (what a good Intro Panel needs to do for the audience; what it needs to do for you, the exhibit planners)...plus bullet points that describe key features. I attached two sheets to show you the 'Intro Panel' description in a grid, and another one-sheet from a recent project for the Shedd Aquarium, showing a 'one-sheet' and a typical example for an Intro Panel that's largely meant to convey the Big Idea and invite visitors in (with a little preview of what they will see and do). Let me know if it helps you to see examples of actual Intro Panels like this….I have written many, and edited even more, over the last 30 years!	We've always known that most visitors 'blitz by' the intro panels...Serrell's research shows that more visitors will be attracted to/read more of an intro panel if it's near 3d elements. The research clearly shows that visitors aren't stopping to read a 100-Word panel. I've been using the big, bold 'summary headline' approach (a full-sentence headline that conveys meaning, rather than a short two-to three-word title that looks clever but doesn't convey meaning since my Monterey Bay Aquarium days). Challenge 1 comes before the writing begins:has the team struggled through the hard work of articulating a clear, simple, direct, relevant and interesting Big Idea? (Did they come up with a good Big Idea? I believe the Intro Panel's job is to convey that idea…so if the team didn't articulate the Big Idea well, that's got to be done now, quickly, and well. (Another issue many writers face is convincing their reviewers to accept and approve an Intro Panel that is SHORT enough to catch the visitor's eye as they walk up, and hold their attention long enough for them to get the point. That's 50 words max (maybe 60, depending on the kind of museum and layout)…hard to get reviewers to sign off on that unless you've done a workshop and goals with them all to get them to buy into the 'Reach more readers' outcome! Next big challenge comes in working with the designer. The way the graphic designer designs the Intro Panel (and the way the exhibit designer places the Intro Panel) will make or break our chances of getting visitors to read the panels.	Sorry, ran out of time….

Laura Allen, freelance exhibit development/design, worked for AMNH	I want the visitor to understand where they are, what they are seeing overall, and the main takeaway(s) of the gallery. If necessary, I include a key piece of information to navigate or decipher the hall, such as a map. (Another example: the hall I'm working freelance on has historic dioramas of state mammals in it. Some of the animals have been extirpated from the state, however, and visitor testing showed that they were immediately visually confusing [e.g. a bison in Pennsylvania]. So my label draft will include this aspect.) It is important to keep in mind that the museum may have goals for the introductory label beyond these basic visitor expectations, for example referencing the gallery's donor, its historical context, or its relational context to the rest of the museum.	Brevity with elegance. Many intro labels could use an editor. A gallery shouldn't need too much explanation. For the museum, the biggest challenge is getting people to read the label. Good placement and design helps, but visitor behavior research shows there are inherent limitations on the percentage of readers one can expect.	I'm seeing more intro labels incorporating video or being creatively done through digital techniques that are evocative, especially for temporary shows. One example at The Design Museum (pic of this in the Dropbox), which is not actually an introductory label but instead is gallery signage, is effective. The gallery is called "Designer, Maker, User," and the sign colorfully transitions between these three words, speaking to the interconnectedness of the three components of the design system. For "permanent" galleries, digital tools make less sense as they are less likely to be maintained over the lifetime of the hall, and so are often avoided. Also, the job of an introductory label is pretty straightforward, and too many bells and whistles can distract from the message. In terms of use, one specific change I foresee is more introductory labels for cultural galleries conveying "warning" messages for indigenous visitors who may want to avoid certain objects or exhibit elements because of their spiritual potency. This reflects the growing acknowledgement and increasing presence of source communities in visitorship and in exhibition development. Also, I think some introductory labels are doing more work to explain the "who" and the "how" of the exhibition -- a more reflexive use that not only refers to what the exhibition is about but also how it was created or how the objects/specimens/etc came to be in the hall. However, those goals should not take away from a clear, concise, and motivating message for visitors as they enter the hall. The point is that there should not be too many points in an introductory label. Other labels can pick up secondary threads if need be.
Beverly Serrell	To give visitors a quick idea of what the Big Idea of the exhibition is, in visitor-friendly language, and what the exhibit developers hoped visitors will get out of it.	That data show that exhibit introduction labels in most places are largely skipped or ignored by visitors. Except blockbuster art museum exhibitions.	Well, I hope that exhibit developers will write a shorter label (max 100 words), in a typeface that is readable from a distance, and use graphics to support the content, and put it is a location that is in the line of sigh, and slightly overhead so multiple people can stand in front of it without blocking other readers. The actual installation location should be user-tested for the best spot.

Robin Faitoute, Manager of Exhibit Development, National Aquarium	The National Aquarium used to have more traditional introductory panels/labels—several paragraphs of text together with visuals presenting overarching gallery themes—at the beginning of every gallery. In the last few years, we've moved away from that approach. We now use large [approx 83"h x 43"w x 5"d] introductory pylons positioned at gallery thresholds to orient our visitors both physically and conceptually. This is partly based on neurological research indicating that people are excited and more receptive to messaging at gallery entrances/thresholds. I know you are asking about the text, but I think it's important to note that the intro label should both visually and verbally engage visitors—and both image and text should work together to support the exhibit main theme or "big idea." Location is important too. Are you familiar with the Big Idea concept? The team—led by the developer—identifies a big idea for every exhibition/gallery/exhibit as part of establishing the interpretative framework. This overarching idea guides the design of the whole experience and captures what we want visitors to take away from the overall experience. I usually pull from the big idea to write the intro pylon text. Introductions should provide context and help visitors find meaning in the experience to follow. Museum educators call it an "advanced organizer." For more info on developing a big idea, check out Beverly Serrell's Exhibit Labels. Also, see the attached goals and criteria for our gallery intro pylons. I also try to use inviting, colloquial language.	Keeping the message short and engaging. It's often difficult to distill key gallery messages down to a single sentence or two. Some of that work is done in the early stages of the project as part of outlining an interpretative framework that includes a big idea, but it's still a challenge to grab visitors' attention and communicate an overarching message in just seconds [hence our large pylons with a single attractive image and short text.]. The Aquarium is a little different from other institutions. Our animals are such a huge attractor, making it difficult to hold visitors at the entrance. Text needs to be short enough for a "drive by" reading. Also, there is still resistance from some curators to more visitor-friendly language—although this is gradually changing.	I think more developers are moving away from long, introductory panels at the beginning of a gallery or exhibition. I can't see the intent of providing context and conceptually preparing visitors for the gallery experience changing. Everything I know from educational theory tells me orientation is critical. However, I can see employing other tools and technologies such as video, audio, AR/VR and other types of immersion including unique use of space. We employed immersive sound, light, sculpture and moving water—and only the question, "What's your connection to water?"-- to introduce our multi-gallery Blue Wonders exhibition which focuses on how every living thing is connected to water. We also created several thresholds in the intro area [based on the neurological findings I mentioned earlier]. I think you might also see more reinforcement of big ideas/gallery themes strategically threaded through the gallery, so there are multiple opportunities for visitors to "pick up" organizing concepts that help them make sense of what they are seeing or experiencing at the very point in time in which they are seeing or experiencing it. If that makes sense….
Michael Cagno, Executive Director, Noyes Museum of Art	Our goals are simple. Keep the information clear and simple which while keep the viewer wanting more.	Label challenges in three areas: 1. Content: message and text components which are not to conceptual or ambiguous. Often times they become to abstract. 2. Structure: sometimes the labels become to dense which becomes difficult to maintain the viewer's attention 3. Location: making sure the the labels do not compete with other nearby exhibitions and have the proper lighting and height. At times, this could be a challenge depending on the context of the exhibition.	I think technology and AI will play a bigger role in these labels. Connecting viewers with multiple touch points will provide a more experiential and immersive opportunities. This will provide more engagement opportunities in telling the story.

Michael Lenahan, Interpretive Planner at The Design Minds, Inc.	Primarily, you want to reinforce the "big idea"—or core message—of the exhibition. Visitors should read introductory text and, on a high level, understand what the story of the exhibit is all about. Beyond that, you want the text to be engaging enough to spark a desire for further learning. State what the story is all about, but also prompt the visitor to explore the exhibit and uncover deeper truths.	The biggest challenge is tackling the scope of the exhibit's story. The writer must work carefully with the rest of the exhibit team to craft expectations for this panel. It should satisfy the goals listed above; it should not be a straightforward summary of an event or events. Develop an engaging introduction—visitors will learn more as they dive deeper into subsequent labels, imagery, artifact displays, etc.	I don't have the research in front of me to back me up, but I feel as though the number of "streakers" in museums—those visitors who breeze through an exhibit and only read a few panels, if any—is going up. Thanks to the proliferation of smartphones and social media, visitors are used to receiving information quickly and in easily digestible chunks. If you put up an introductory panel with 200 words and a timeline, you may risk alienating visitors looking for a quick hook. However, I choose to see this as an opportunity instead of an obstacle. Do not bury the lede. Find the meat of the story, and present it to visitors. Make them feel involved through direct questions and provocative facts.
Barbara McGrath	• To prepare the guest for what they are about to see and learn • To express the bid idea of the exhibition • To make the exhibition engaging and intriguing even irresistible— to appeal to the emotions as much as the intellect	• To keep it short enough that they can be easily read either on the move or while stopping for a very short period of time • To make the words engaging enough that guests won't just blow by them • To establish the voice and tone of the exhibition • Work to make the writing here effective for marketing the exhibition too. All communications for the exhibition ideally are linked by voice and tone.	• Will they even be written labels? Or will audio and video the methodology? • Possibly greater need to communicate with non-English speaking guests
Karen De Seve	The intro is really meant to spur visitors to start thinking about the main idea behind an exhibition. It can serve to visually cue a way of thinking. It can serve as a time portal. So the visitor outcome or goal would be to understand the basic gist of the exhibition. Nothing more. Nothing less.	Really, the biggest challenge is the idea of an intro panel in and of itself. Most people don't read them. Unless there is a timed ticket with a queue, folks walk on by. In theory, intro panels serve a purpose, but in practice, that purpose is almost always lost due to bad placement or too many words. To me, the most effective intro panels include a title and a single sentence that summarizes the main idea of an exhibition. Possibly an additional image or object with a caption. More than that, and visitors won't make much use of it.	I would like to see more "gateway" types of integrated experiences rather than a flat label or panel. Doesn't have to be digital, but should be experiential in a way that weaves together an experience with interpretation.

Appendix B: Exhibit Developer Interview Instrument

interview for exhibit developers

1. When you are preparing to write introductory text for exhibitions, what goals or visitor outcomes, if any, do you have in mind?
    a. Can you send me 1 or 2 examples of specific intro text goals from recent exhibits?

2. Can you describe the process your museum uses to write introductory text? For example, how many people are usually involved? What are their roles? Who has the final authority in the process? How do you establish and agree upon a narrative structure (if at all?) etc.

3. Can you describe the process your museum uses to display introductory text? Please include here a description of how you position the text within the exhibition entry space.

4. What are some of the greatest challenges you encounter during the process of preparing introductory text?

5. Does your team articulate a 'Big Idea' for each exhibition? If so, how do you translate the Big Idea for your visitors?

6. Expound on your greatest success in writing and displaying intro texts that attract, engage, and orient many different kinds of visitors. How do you know the introductory text worked for these visitors?

7. Do you prototype and/or conduct front-end and/or formative evaluation when creating intro text? If so, what is your approach?
    a. Would you be willing to share the results of any evaluation you've done?

8. In what ways, if at all, do you foresee introductory text for exhibitions changing over the next few years? (This can include both the act of creating them and the way visitors use them.)

Non-Disclosure Agreement

Your participation in this project is voluntary and you may withdraw and discontinue participation at any time without penalty. Participation involves being interviewed via telephone and/or Skype. The interview will last approximately 30 minutes. With your consent, the interview will be recorded using a combination of written notes and audio recording. You may decline to be audio recorded without penalty. There is a slight risk that the topics discussed may refer to stressful past or present situations in your professional life. If at any point you feel uncomfortable in any way, you have the right to decline to answer any question or to end the interview. If requested, I will not identify you by name in any reports using information obtained from this interview. However, the nature of the questions may make it possible to identify either you or your institution even if you are not directly named.

Appendix C: Exhibit Developer Interview Respondents & Takeaways

Laura Allen, Exhibition and Editorial Consultant, NY, NY

- **Goals for introductory text:**
  - I want the visitor to understand where they are, what they are seeing overall, and the main takeaway(s) of the gallery. If necessary, I include a key piece of information to navigate or decipher the hall, such as a map.
- **Challenges:**
  - For the museum, the biggest challenge is getting people to read the label.
- **Predicted changes:**
  - I'm seeing more intro labels incorporating video or being creatively done through digital techniques that are evocative, especially for temporary shows.
  - One specific change I foresee is more introductory labels for cultural galleries conveying "warning" messages for indigenous visitors who may want to avoid certain objects or exhibit elements because of their spiritual potency. This reflects the growing acknowledgement and increasing presence of source communities in visitorship and in exhibition development.
  - Also, I think some introductory labels are doing more work to explain the "who" and the "how" of the exhibition -- a more reflexive use that not only refers to what the exhibition is about but also how it was created or how the objects/specimens/etc came to be in the hall. However, those goals should not take away from a clear, concise, and motivating message for visitors as they enter the hall.

Jessica Bicknell, Head of Exhibitions, Penn Museum, Philadelphia, PA

- **Goals for introductory text:**
  - For us, the difference comes out in tone - so in the voice of intro, but also in the design. And how it functions, and how long the text is. If it's for kids, it's shorter and brighter, and if it's for adults—like our exhibit on the mound-builders, we might try to strike a poetic tone.
- **Process of displaying introductory text:**
  - We usually do a title, subtitle, and 30-50 words. We used 30 words for one of our more sensitive exhibitions, on state violence in Jamaica. Made it short on purpose, wanted it to be a big impact.
- **Challenges:**
  - We usually write tombstones first, and intro text last. so yeah, though intro text often encapsulates part of big idea in that it is written very early on, so finalizing it is one of the last things we do.
- **Success story:**
  - When I'm' doing summative evaluations, it becomes clear whether someone has read the intro text, because their response will say something similar to the text.
- **On prototyping:**
  - Yeah, we do from time to time prototype label text generally, and usually we'll print out a thing and go show it to people and ask their reaction, or show 2 versions, so that's more formative. But not always for intro text. Often when we need feedback on specific label or tone direction, or that kind of thing. It's usually early on that we show the labels we're testing. Like we just opened middle east galleries, and I didn't write the labels for that, but I prototyped ideas for labels and taped up pictures. I usually show it to whoever's around that day, and pick busy days - so that was a member's special event kind of thing, but I know the team here has posted things on Facebook, and also done title testing, so that's a part of the intro text.
- **Predicted changes:**
  - maybe we'll get to the place where everyone is customizing their own experience, I don't know.

Jane E. Boyd, Exhibit Developer/Museum Consultant/Writer & Editor, Philadelphia, PA

- **Process of writing/defining narrative structure:**
  - Narrative structure comes out of exhibit development process. In my experience, often the narratives written for grant applications or prospectuses or other writing that happens before the exhibit script gets written, often the ideas or themes or writing style developed for those pieces of writing gets folded into intro text and text as a whole because it's language that's been shown to be effective, so we build on that instead of trying to reinvent the wheel.
- **Process of display**
  - [As an independent contractor who often works with small institutions] I've not been able [to experiment with putting text next to other striking elements / to think of ways to involve visitor in a full-body experience where they choose a particular direction to go, or walk through a particular archway, to make it more experiential] - haven't been able to achieve that yet but would like to.
  - I think it'd be really great to put an object at the entry if you have an object-based exhibition and do some interesting interpretation around it and use that to lead the visitor in.
- **Success story:**
  - I don't want to claim a greatest success, but I'll use that example of "Broken Bodies" at the Mutter. Because it was longer-term, I did front-end and summative evaluation with the UArts class. We received 2 major federal grants for that exhibit and that really forces you to articulate the goals and purpose early on. So we ended up using language directly from the grant. The intro introduced 5 voices of exhibition. One for each section. How do we know it worked? Anecdotal observational evidence. I've spent a lot of time there. Very often I've seen visitors slow down, they really read, look, talk to each other, absorb exhibition as a whole, can't say I really watched everyone to see that they read the text, but people were really reading a lot. I don't think I saw anyone just breeze by it to look at something else. Summative evaluation showed that people got big idea and responded emotionally. We were concerned about the emotional thing because we wanted to tell very human stories involving the body and disease.
- **Predicted changes:**
  - I'd really like to see museums experimenting more, use fewer words, other modalities like visual / object theater / immersive experiences, see how few words they can get away with, re-think intro text as just one part of entry experience.
  - Would like museums and developers and designers to really put their heads together and think, how can we make this really be a microcosm of the whole exhibit for the visitor and really welcome them in? Not put them off at the very beginning, but make it very convivial and appealing and enjoyable. When you have limited time and resources, particularly in object-based exhibitions, you're focused on objects. In exhibitions with a lot of interactives, people aren't going to want to put an interactive at beginning because you're wasting your thunder. They think it should be at the heart of the exhibition. But if there's a way you could have a sort of miniature interactive experience or do something relatively low-cost but still effective…I mean just use the wall for something, get some content on there.
  - I like the intro text to be more about asking questions and drawing visitors in than about making definitive statements.

Eileen Campbell, Sr. Science Writer, Exploratorium; Owner of Farallon Media, San Francisco, CA

- **Process of writing (in this case, for outdoor public art exhibits)**
  - The text [in this outdoor context] answers a question: what the heck *is* this thing—and it's hard to figure out where to put the text. And working outdoors is an exercise in humility.
- **Process of display**
  - So recently we did a whole wayfinding thing. Signage includes the name of the gallery, what you might find there (plankton, a big tree, other icons…) —and that process was a whole big… editorial, graphics, exhibit designers, and marketing all involved. (Because they were interested in branding along with it.) Plus management. We have 2 temp. exhibitions: exhibit developers, writers, graphic designers [work on those]. Usually those are more art -ish than science-y.
  - We have a very strong visitor research team. Not always available for exhibits, but whenever possible, we grab them. They focus more on prototyping.
- **Challenges**
  - Introductory text is like a cross between interpretation and wayfinding graphics. It's always about, "here's something new! You're about to enter…x, y, z." Words and graphics are important. At Exploratorium, we don't do a lot of beautiful, arresting, compelling visuals. They're pretty mechanistic. It's often just words. And I can write great words, but there needs to be something more. I was looking at examples of stuff we've done here—usually way too wordy. Let's let people come in, and then they can stop. Ideally they don't even have to stop and read…they can sort of take it in while they're walking by—and it draws you in, excites you, but doesn't slow you down.
- **Success story**
  - One of our special exhibitions, kind of an art one, called "Strandbeests"—they're imagined creatures that have sails and walk independently on the beach. The intro wall was effective. But had too much text. Had a huge photo. Took you to the place of these creatures. You saw the creature in the museum, but you can sense the environment they're designed for.

Sara Crawford, Exhibit Developer, Natural History Museum of Los Angeles County, Los Angeles, CA

- **Process of writing, display, and Big Idea**
  - Kind of funny - generally the process I've ended up using is we design the whole exhibit and at end work on the intro and conclusion. It's kind of at the last second that we tackle those. In the beginning we work hard to come up with an entry experience, but we don't want to rely on text to convey the big idea because that's not necessarily something everyone will read; we can't rely on that to convey the message.
  - We have to rely on design and the overall experience. to convey the Big Idea. So we have the Big Idea, and we develop the exhibit, but we can't write the actual text til the end. Even up through design sometimes what you want to convey is changing.
  - Even though you have a Big Idea, when I'm writing, I don't want to list vague Big Idea messages to people—I want to use specific examples.
  - For most museums I've worked at there's a curator. who kind of does research and has a scientific background, and there's a developer. Whenever we're writing I'll interview them about what concept they're trying to communicate, and

then go back on my own and synthesize it through digestible bullet points that communicate to audience, and then go back to the curator, get bullets/outline approved, and then try writing text, then go back to curator, hear feedback, add changes, another re-write, back to them again.
    - Once that's approved, we'll bring it to the designers, they do layout and show it to the curator; at that point design is kind of in charge. Curator is not making edits at that point. Then it goes to production. Again, since we're writing this at the end, all those discussions about who the audience is, how this will sound, has been worked out. And that narrative structure has been driven by the audience and the exhibit developer is keeping an eye on that, and knows all the things the curator wants are there. Design doesn't have input on what we're writing, but if they're like "I hate this line break" we go back and forth.
- **More on process of display**
    - From the start of process, there's a research phase, and designers are doing research on what other museums have done when tackling similar topics, and finding inspiration from the world in general. Did exhibit for Field Museum on China. Early on, developers went to China (not me) and did research of architectural elements, talked to people, went to museums, and so from beginning when we were talking about content for the exhibition, we were also looking at visual examples and pulling from visitor language to use. So from beginning we had those concerns in mind as we wrote. They'd come up with some ideas, we'd do some writing and bring it back to them, that would inform design, so back and forth.
    - In terms of where the text is positioned, that depends on the floor plan and layout - think of where people are walking and look for a good sight line. Did one exhibit with a designer who was new. They had a background in theatrical design. Had a beautiful visual sense but not used to working with text. So he tried to integrate the text into design elements and visitors were missing it. So in some ways, having text integrated into space can be great, but if it's not clear it can be a challenge.
- **Challenges**
    - I guess they're the same challenges as preparing any exhibit text – you have so many concepts to communicate and not enough space. Sometimes I write 120 words, then cut it back to 40.
    - For intro text, it usually takes me a day to write a paragraph, sometimes longer. Any time I'm trying to communicate a really big concept in a small space, it's very time consuming.
    - Also I think sometimes when you start an exhibit. you probably don't know much about the topic. By the time you finish, you're a mini-expert. Putting your head back where you were when you first started is key. Trick I learned from former exhibit development boss: said before you start any research, write a list of questions about topic. So that's always a challenge. Also, because you're trying to write something incredibly introductory, it feels trite or too simplified, but again I think that's kind because you know more than you did when you started.
- **Predicted changes**
    - The other thing I was finding – visitors weren't even perceiving separate exhibitions; they didn't even know they were walking into a new exhibition. They don't see museums in the same way we do necessarily. So just assuming someone's going to read, it doesn't matter how big you put something on a wall, but if there's a change in lighting, or the ceiling changes, you're going to get someone's attention. So through the design you get someone to read.

Robin Faitoute, Manager of Exhibit Development, National Aquarium, Baltimore, MD

- **Process of writing**
  - As the lead, I work with others to establish an exhibit core team. We have an exhibit designer, developer, project manager, and there's someone in the role of writer. When the developer is separated out from the writer, they lead the conceptual development, the storyline; work with team to define main messages, goals, and objectives. The writer is usually the same person, but if not, the writer is articulating those things and writing the script.
- **Process of display**
  - We have an exhibit steering committee. At the end of each stage of the process (conceptual, etc.) we go to the steering committee and present it. To be honest, the CEO is a good writer and he pays attention to text, but everyone else pays attention to graphics.
  - Within the team, the designer and writer work together to develop hierarchy and that's an outcome of the 2 designers in 3D and 2D working with the team to identify the look and feel and design intent, and from that, the hierarchy starts to take a form, all in support of a timeline.
  - We have brand guidelines that are still in development that provide a framework for how things should look and feel. We have brand colors that are tweaked in different ways [between one gallery and another], a brand voice…and within that the tone can vary a little.
  - He help people find personal meaning through words like "we", "all", "join", "you"—we speak to YOU, the visitor. That's a way of expressing that we're not just an institution; we're people too, so that together with the familiar language shows we have emotions too.
- **Challenges**
  - We use 50 words max.
- **Prototyping**
  - In a few cases we've done testing [using magnetic lettering and asking people to write sentences about their connection to water] and used the exact language that we got back from testing visitors.
  - We do meaning mapping: give people a sheet with water at the center of it, and they write down what comes to mind. We also do sort cards: "put in order which of these conservation actions you'd actually consider doing." Sample size is usually around 200, or sometimes we cap it at 50 or so.
- **Predicted changes**
  - New technologies and all the opportunities for conveying the multi-modally, to engage different learning styles and attract people—more use of video, virtual reality, there's all kinds of ways you can layer that. In theory all your messaging should speak to that main message but maybe we need to be more concrete about it sometimes.

Randi Korn, Owner of Randi Korn and Associates, Washington D.C.

- **Goals**
  - Intro text is providing people with conceptual framework/underpinnings/ conceptual introduction to the exhibit. Should tell people the why behind their visit, why this idea is important, why this museum has this here, and give the lay of the land, and plant a few seeds about what visitors might experience as a result of having gone through. I think seed-planting is important. For very early studies we did, I can tell you what we notice: often that the intro label is

in the wrong place. It's not in the place visitors would go. When it is in the right place it's often poorly written. Doesn't plant the seeds, give the big WHY, and too long-winded. I think it's incredibly important because behaviorally people are expending the most energy at the beginning of their exhibit and the least energy at the end. I've collected enough data that I can tell you it's incredibly important to have a well-placed, well-written introduction label.

- **Process of display**
  - It's often an after-thought, because people were so ensconced in designing every detail of the exhibit. And it's often not paid enough attention to at all. Intro and conclusion text can function in the same exact way. Can be a good idea to combine those if design allows to happen.
  - I'm just surmising here that based on my conversations with museum staff, [people don't tend to think to] articulate the essence of their exhibition; they just kind of like dive right into the center of the pool and are mired in the details and don't step away to think about the thesis, the general thesis. I'm thinking more of exhibits that have a lot of interactives, maybe science museums, but I think there's great virtue in always stepping back, being clear about goals, thinking about what you want visitors to experience.
- **Success story**
  - I used to the interpretive program manager at the Chicago Botanical Garden. I wrote every interpretive label. I focused on what people can see: is it in bloom? Not in bloom? Is there a color to bring attention to? What's the most unusual thing about this flower? You have to think about what people experience and see in your presentation. But the whole WHY thing is important.
  - Intro labels should be visual—there needs to be some 3D or visual graphic to help people see something that maybe they wouldn't have noticed before. People are totally more likely to read if there's an object.
- **Prototyping**
  - We usually like to show people some text with some visuals. We usually work with a binder so we have the text printed out, llarger than you might see otherwise, with some visuals for context. We might present the context of the exhibit first: this is the layout, the space, the objects—and then we show them the intro text. So that's one scenario—you want to see if there's alignment with the intro text and what the exhibit contains. Or you show the text and say, "what do you think this exhibit is going to be about?"
  - On the museum's Facebook page, we'll post, "between 1:00 and 4:00 on Saturday we're collecting data, talking with visitors about a new exhibition" and they might sign up.
  - After each day of data collection we recommend revisions and then go back out and test again. We think it takes 3 reiterations to nail it; to get it reasonably understandable and clear.
- **Predicted changes**
  - I wonder if they'll become more changeable. I think they're still trying to figure out how to use technology. They're the most important part of an exhibit and they're attended to minimally. They're important because they set the stage, and again, people have the most energy at the beginning.

Erin McLeary, Museum Director, Science History Institute, Philadelphia, PA

- **Visitor Goals/Outcomes**
  - We have a very small gallery and that shapes a lot of the decisions we make. We assume intro text could be the only text people read at all. So the goals are usually—if this is the only thing people read—can they get the idea of what this exhibit is about.

- **Process of writing**
  - We've been using a 2-exhibit developer model with a team. There's a primary and a supporting exhibit developer and those roles switch from exhibit to exhibit. The primary writer writes what we call a project charter. This is kind of a first articulation of the exhibition concept. Usually there's a core of 2 to 5 people who are involved in fleshing out the overall script. Usually the primary developer does the primary draft of the script but they might get pre-writes from other people and then they edit it as a group. And we typically don't break out intro text as a separate thing. Roles on that team might include the registrar, the collections manager, anyone who's been recruited for content expertise, and final authority is divided between the primary developer and me.
- **Narrative structure**
  - For different projects we used different processes. We usually start with a project charter to articulate goals of the project. The first question is to articulate the big takeaway message of the exhibit. What the developer wrote there, for the PC, became the intro text. For another recent exhibit we went through a much more iterative process for the whole team, articulating goals for each section of the exhibit, and then worked backwards to develop an intro that got all of those messages across.
- **Process of display**
  - We have a really boring answer for this one: we always use the exact same space in the gallery. It's just a square gallery with no particular threshold moment or real ability to create one. Double doors dump you straight into the gallery. Since we can't really do a threshold experience we try to create some drama with the way it's displayed—maybe a really large-scale graphic, dimensional lettering, specific use of color that's there in that section and not in other places in the gallery. We always try to make it look different and special.
- **Challenges**
  - It's really coming up with a succinct, clear, inviting message.
- **Big Idea**
  - The project charter tool that we use does ask the development team to articulate the Big Idea or a takeaway message. We do not limit ourselves to one sentence. It can be up to three sentences. It's Serrellian-inspired but we're not sticking precisely to her guidelines. We define that for the PC early in the process, but sometimes during the development process we further define a clarifying concept or a question that we ask ourselves. That question which is often very short, is intended to rule content in or out of the exhibit. It's somewhat like a Big Idea, but again a little different than how Serrell explains it.

Irina Mihalache, Assistant Professor of Museum Studies at University of Toronto

- **Process of writing**
  - In my experience, I've had a lot of freedom with writing, but I'm always cautious about that idea of freedom. I want other people to read over what I've written. I've worked on different types of projects, for example on projects that are much more about community collaboration. I did a project with workers in the settlement sector. Their stories were interpreted within an exhibition. In that case, every single storyteller that was part of the project also read the interpretive panels and gave feedback. In a community collaborative project, especially if the exhibit is about other people's stories, I definitely encourage feedback and I usually have to give away some of my authority.
  - When you're dealing with other people's stories, the power of the narrative can detract from the authenticity of people's stories themselves.

- **Process of display**
  - For the exhibit on the people in the settlement sector, we wanted to include context for the stories and a context for the [exhibit development] process, so we have text and a video. The video introduces the different storytellers from the top. It was useful to think about the video together with the text, and then I wouldn't have to speak on behalf of the storytellers. I took away that part and allowed them to speak more.
- **Challenges**
  - Trying to be dialogic in intro text is very important. Rather than being descriptive, it has to have some invitation for reflection, which is a challenge because you have to make a decision about what to emphasize and de-emphasize with the exhibition.
- **Predicted changes**
  - I do a lot of research on the Art Gallery of Ontario. They are pioneers in interpretive planning in Native American subject matter. They've figured out a good formula that works. Their sequence: relatively short intro panels, often with some sort of timeline, and something that speaks to other perspectives of the exhibition. They often have quotes. More of an intro "complex" than an intro panel, and they try to "train" the visitors against thinking there's only one voice on a topic. So I think changes might include ways to make it much more obvious from the get-go that their perspective is just one out of many.

Sasha Nemecek, Associate Director of Exhibitions, American Museum of Natural History, NY, NY

- **Goals/Visitor Outcomes**
  - Our team does not sit down and articulate, like, OK, here is a big idea and we're all in agreement and all working towards that…which is not to say that we don't have an understanding of the general idea. Because we don't always all write it down and agree, sometimes we can all have different ideas about the Big Idea. The Ocean show [we just finished] is kind of an example. Editorial wanted to convey "we're learning more about the ocean now than ever before." Others in the department thought the Big Idea was "you're going to take a journey from the top of the ocean to the bottom of the ocean." So when we got to writing the intro we sort of had to straddle that. And sometimes things shift a little, and we find that this or that might be emphasized more.
- **Narrative Structure**
  - We've been moving toward shows that could be done in any order lately, because we think a lot about how our shows travel.
  - Shows that are ON somebody like Einstein and Darwin have very strong narrative structures with a beginning, middle and end to their life.
  - The show we're about to open—T. Rex—does have a narrative structure to it, so we just have to hope that we don't shift it around. We wanted to tell this making of a super-predator. So we start with kind of small, early Tyrannosaurs, and then move into the question of "how did the T family start to get bigger?", "What made TR in particular so large?", and then "how/what are traits that evolved
    that made it such an effective predator?" So there's a structure there. The curator wanted to tell the story of the evolution of a mega-predator. The intro to the T-Rex show will show a model of a baby T-Rex and ask, "How did this little critter turn into a killing machine?"
- **Process of display**
  - Our graphics team works to develop a really amazing-looking title. You walk in

and T-Rex is in a big interesting type-face, it sets the tone; they're establishing a visual look that'll be carried throughout the show.
    - we have trouble getting visitors to read a random panel of text, but I feel like when you walk into a space for which you've paid, and you're at the beginning, you want to know what it's about and you think "oh this will help me understand what this is about." We see that through observations.
- **Challenges**
    - The curatorial review—sometimes they look and think of it more as a scientist and there's a bit of this intro copy that's like the back of a book jacket…they don't always get that it's about selling. Often we'll try to shortcut something—it's not inaccurate, but they would like to say it with more precision. Sometimes we say, "can we do this in a way that satisfies both of us?"
- **Goals**
    - Going forward, we'd like to think our exhibits are more and more immersive [like with Unseen Oceans intro], and if that immersive experience starts at the front door, that might change the introduction, because if you're surrounded by—like for an exhibit on color where things are shifting and changing before your eyes, you might not want to turn to look at a text panel.

Christine Reich, Vice President of Exhibit Development and Conservation, Museum of Science, Boston

- **Goals**
    - We tend to focus here a lot on teaching STEM habits of mind. So providing them with avenue for practicing those habits of mind, but also having those STEM habits modeled for them. For all of our new permanent exhibits we think about ways to engage visitors in strengthening their ability to investigate questions, create solutions, and imagine possible worlds. So as we're thinking about our labels, we're trying to think in terms of educational goals, getting them to engage in those practices, getting them to start the process of investigating a question or creating a solution using the engineering design process.
    - In "Science Behind Pixar", some of our labels and video interpretation provided examples of how the computer science engineers at Pixar actually go about creating solutions by using strategies like problem decomposition—so, we're showing other people's thought processes.
    - The other part that's critical for us is engagement. We're trying to think about the emotional engagement of our visitors, and the way we do that is thinking about doing it through activity. We can strengthen emotional engagement by giving visitors a scaffold and support as they're engaging in activities, as they're investigating a question, engagine in the engineering design process. Getting visitors to be in a place where they engage in a productive struggle is another aim.
- **Process of writing**
    - Content developers here are like educators. Once we started working with mixed media, the [old] division of labor [between content and design] wasn't effective because graphic designers often had the best idea for how to present the label in a way that minimized the amount of words. So now, it's a much more integrated process where the content developer really is ultimately the person, but through team discussions they figure out what we want to say at particular areas, and then they hand the text over to graphic designers, and the designers say "I think I can eliminate this text by adding this image."
    - Through this process we eliminated entirely the text for "what to do" and added

small videos showing you what to do, and we think that'll be great for multi-lingual interpretation, as well as helping visitors with various leanring disabilities. So it's a much more collaborative proess between content and design.
    - All of this is continually being tested with visitors. So research and evaluation is also in there, testing and giving feedback on that interpretation.
- **Process of display**
    - For our next two exhibits that we're working on rather than entry labels, we're thinking about entry visuals. One will probably have some words in entry; there's a long corridor visitors will walk through. It's about using tech to explore Arctic environments, and so we'll have a giant ice wall that will set the stage and tactile artifacts that are technologies frequently used in the Arctic, maybe even a model of a climber on the wall just to provide that sense of what the exhibition is all about. So doing it more visually and not just text.
- **Success story/prototyping**
    - When we're doing formative evaluation, kind of the best way to do it is go out on the floor and ask visitors - when you read the intro text, what do you expect to see in the exhibition? what do you think you'll learn about in the exhibit after reading it? How excited are you to want to continue being in this exhibition after reading this text?
    - The other part is being explicit about who is that intro text for and not for. So some of our exhibitions, particularly those without a linear narrative, which is common in science museums, we want people to learn through each interactive, and we're ok with them not reading then intro text, but then we look specifically at "which audience" and we evaluate the intro text in terms of that audience. So, will teachers know how this exhibition connects to the curriculum? Because it's often through the intro text that they figure that out. Or, do older adults realize that intro text orients them properly to what's in the exhibit so they know where they want to go?
- **Predicted changes**
    - Everyone knows, our visitors don't read text very often. And yet we keep kind of banging our heads and deciding that's the mode of interpretation that should be used because that's how it's always been done. As small screens become cheaper, as video production and audio becomes cheaper, I hope that we'll move toward multi-modal ways of interpretation. Not only are our labels not widely read, there are many groups for whom text is just inaccessible. Someone blind, born deaf, ESL, early learners, visitors w/intellectual disabilities… I'm hoping we'll move away from intro text toward some sort of intro orienting experience that does not to rely on text as the medium.
    - It is making text the support to images that makes the difference. Now, we're like what if we JUST have videos that kind of tell you what to do, show you what to do.

Michael Rigsby, Interpretive Planner, Writer, & Developer, Athens, OH

- **Process of display**
    - At Monterey, and I think they're more or less combined now there - design and developers - but back when I worked there, developers were in education and design was a different dept., but there, as a developer, I had a lot more say and control over that and I was like "how are we designing this, where are we putting the intro labels," and Judy [Rand] was always a strong advocate for, "they've gotta be prominent, gotta bonk visitors in face when they go in or they're gonna pass and miss them and they're important," so there was that dialogue back and forth.
    - A project I worked on independently - trying to remember instance where I had a say over that. designers put them where they put them. I…try to keep a voice in there about where we're going to have the introduction [and how overall display will work].

- **Challenges**
  - I typically write like Judy [Rand's] style - subheads, a full sentence, for each label. And if I can think of that one sentence, from there I can write the whole label. It helps, and the whole thing comes much more quickly once I have that.
- **Predicted changes**
  - A sort of hallway with themed messages and video projections going along on the side—that kind of thing has come up a couple times now so that strikes me as something that might be an approach for the future. You're moving thru the space and not really stopping to read but you're getting these messages through some sort of media on the way in.
  - I could see, more immersive things like that [hall of sardines swimming overhead], instead of walking in and being hit with a panel and then you see these other exhibits, it's like you've entered this other space and you get the flavor in a very brief moment.

Tamara Schwarz, Director of Exhibit Development & Strategic Planning, California Academy of Sciences, San Francisco, CA

- **Goals**
  - So our intro texts are generally part of an overall exhibition title and visual element of some sort, so they're - it's a little bit of a different approach than you sometimes see in an art mus where intro text might be just a panel of words. And so we think of the title and the introduction kind of as a unit, usually, and we want them to work together to kind of communicate to visitors what the exhibit is about, and set expectations in terms of the look and feel and the overall attitude for the exhibit. We want them to be something that is fairly attn grabbing and kind of invites visitors into the gallery, and we want to convey the exhibit's main message and set expectations for what the visitor is going to experience in that exhibit, all while being scientifically accurate and memorable and all of those things.
  - We try to come to a place of agreement on how to introduce the exhibit in a way that meets our objectives in terms of voice and tone, and sparking visitors' interest, and scientific accuracy, and effectively prefacing the exhibit content. So, there definitely are times where someone maybe objects to the way something is written in an early draft, and we may try a bunch of different versions to get to a place where something is satisfied.
- **Writing process**
  - We do establish a Big Idea for each exhibition, as early in the process as we can. That Big Idea might evolve a little as the project progresses, but we always want the intro text to convey that big idea at least to some extent. And so, often, the intro text is not the first thing that we write. (laughs.) It's often either something that's written fairly late in the process, or we might write it early in the process and then come back to it after a lot of the labels are written. Because sometimes, the way all the other material in the exhibit plays out changes how we think about the intro text a little.
  - We go through a lot of iterations. So for any 50 words that end up in the final exhibit, there may be 300 that came before that didn't make it.
- **Display process**
  - The pairing of introductory text and visuals is really important, and that's something that we work really closely with the graphic design team so that those elements reinforce and support each other. In terms of positioning the text within the entry space, depending on the gallery, that happens in different ways.

In our big really open galleries we often have multiple exhibit intros, so we try to position those at the points where we consider the different approaches that most visitors are going to use.

- We've had exhibits that have 2 or sometimes even 3 exhibit intro panels to capture those different approaches. In other places where we have a clearer, single point of entry, we try to put the introduction text either just inside or just outside that point of entry. And typically if it's just outside we might even repeat it inside. Because often if it's on the outside people just blow right by - they want to get to the exhibition.

- **Challenges**
  - It's always a challenge to try to set up a large exhibition in 40 to 50 words in an intriguing and inviting way. And we do adhere pretty strictly to that word count, because longer text—particularly in an intro panel—people don't tend to take the time to stop and read something longer. So we want it to be as short and intriguing as we can make it.
  - The other challenge is what I was saying earlier about galleries with many points of entry and free form visitor flow—you don't really know if people are going to notice the intro text as they pass by it and realize they've entered a new exhibit space or not. And so the intro text should kind of set up the entire exhibit, but it's also something that we know a lot of people may not read or certainly may not read first thing.
- **Big Idea**
  - Typically we try out a couple of options early in the exhibit development process, so that's part of the concept phase where once we've got a sense of what the major themes are going to be, we want to make sure that BI that we articulated that everybody on the team is really on board with it. So the content developers generally generate those BI's and bring to exhibit team for discussion and input, and the science advisors also give input on that. Several times during our exhibit process we present updates to our sr. leadership team, and sometimes at sr. leadership level we get some input on the BI - either someone thinks it should be something different or it doesn't capture the whole exhibit or something. So sometimes that idea might evolve a bit as we move through the exhibit process.
- **Success**
  - 2 examples that I'll highlight that I think are each successful in different ways. One of them is the intro text we did for the skulls exhibit which was a few years ago, and this exhibit was in the only gallery that actually has doors on it. So it has a very clear point of entry, which is one of the reasons I think it was successful. So there's a clear entrance and clear exit from this gallery. And the introduction was on this big wall right outside the gallery so you saw as approaching. Title was "skulls" and we displayed around 600 diff animal skulls of all diff kinds. For the introduction, we had photographs of several different skulls as kind of our heroes so to speak, and we wrote for each one of those skulls, a one or two sentence short blurb about that skull but they were written in a somewhat playful and conversational way that I think really worked well to kind of get people to notice what was unique about each one and to get a sense of the main message for that exhibit, which was "every skull tells a story", so it was almost like each skull was telling you a little story. We do know the skull exhibit was one of most popular exhibits ever, and we got some sort of anecdotal comments about that intro being really fun, and it was visually quite simple but also really eye-catching.
  - Another example is a quite different kind of exhibit intro, in our aquarium. It's the intro to our coral reef gallery. We have this big curving wall, and on the opposite side of the wall is the giant window for the big coral reef tank, which

itself is a stunning tank and people spend a lot of time there. So for this curving wall we decided to do a combo of media projection and dimensional elements along with the exhibit intro text. And for the media projection we were able to use some really phenomenal time-lapse photography that was done at high magnification of different corals, maybe 100-300x enlarged. So you're seeing individual coral polyps that are moving and sort of expanding and contracting and doing all of these things. It's really beautiful footage, it's also kind of weird-looking. They sort of look like these weird alien creatures that you don't really know what they are. So this is a visual composition that's really dynamic and compelling and it's something where people do tend to kind of stop as they're approaching the gallery to take in this whole composition, and I think they want to know what they're seeing. So they will sometimes pause as they get closer to read the introductory text there. And the scale of what you're seeing in this video, and there are also some printed macro-photos of coral on this wall, and the scale is so dramatically different from what you see when you're looking at coral in an aquarium tank that I think it causes people to kind of stop and ponder and it's a great way to communicate to people that corals are animals and not like rocks or plants or whatever else people might imagine they are.

- **Prototyping**
  - We do front-end evaluation, not for every exhibit, but for most of them, where we interview visitors and sometimes we'll do card sort activities and things like that to get a sense of how people respond to a potential exhibit theme and to the concepts we're considering, and what kinds of language our visitors use in talking about those concepts, and what questions they have, all that standard front-end stuff. So that's definitely helpful in kind of grounding us in the terminology we use in the exhibit and understanding if there are any misconceptions or words that kind of trip people up or mislead them in some way.
  - Card sorting: there are many variations on this, an example is we might have a set of anywhere from 10 to 20 cards that have words on them, or pictures, that represent different parts of the content that we think we can include in an exhibit, and we invite visitors to organize those cards in ways that make sense to them, i.e. 'organize these in order of your interest' or 'how do these cards fit together into different themes' or something like that. It's a way of kind of getting some insight into the mental map that an individual visitor might make into your content.
- **Predicted changes**
  - For us, it's the move to multi-lingual, and I hope that's something we'll see happening in more museums in the US, and that does affect the choices you make about how you present your intro text, and length and so forth.
  - I also think that there will be more opportunities to incorporate multi-media elements in some way, like the aquarium example. Certainly that's not unheard of now, but it's likely that will become more common over time as more museums are using multi-media in more creative ways.

Karen de Seve, Principal of Creative Content Studio, Philadelphia, PA

- **Goal**
  - The goal is to engage and excite visitors. The outcome is to launch them into the experience.
- **Writing process**
  - It's a project-by-project basis. It's really to keep the text as short as possible, and to try to have one final sign-off person.

- **Challenges**
  - Placement is often a challenge. Visuals area a challenge. The best way to get people involved is to put the text next to an image or an object—teams often don't think holistically. Getting people to keep it really short is a challenge. And I will always advocate for the visitor experience.

Page Talbott, Principal of Talbott Exhibits and Planning, Philadelphia, PA

- **Goals**
  - Intro text is usually last thing I write, because the whole exhibition needs to relate back to it, so if you have 5 themes in the exhibit, you want to make sure you touch on all of those in the introductory text. So the goal is to preview those main sections so that when people walk into the museum they essentially know what they're looking for.
  - If it's a biographical intro, then you want to give at least a sentence that provides context to who the person is and when they lived or something like that.
  - Generally speaking, I would say even the introductory text should be no more than 150 words. It can always be shorter…I truly believe that less is more and that people's attention span is remarkably short no matter what age.
  - It's really key to have whatever text you have be graphically interesting, and have the graphics be cohesive. You want people to recognize graphic style, so you want to be consistent in fonts.
  - It's really important no matter what the kind of institution, to have an authority established so that one person can so OK, it's good to go. And the person who's saying it's good to go, generally, is not the one who's doing the writing. It's important for the writer to be really familiar with the content, and it's really helpful to have a single voice, though often that's not what happens. Like in science museums, you'll have different departments with different expertise, so you need a good editor who can provide that single voice, and then hopefully someone with authority to say ok good.
  - I think it's really important to have a graphic vocabulary that is inviting and is repeated so you have your main intro text, and then your "A-level" text for the diff sections, and each of those relates to the other and may involve some color, may involve some grayed-out material that sets into context but isn't intended to be read, may be some kind of superstructure that has elements that are somewhat symbolic in the material that follows, so whatever your graphic identity is it ought to be carried out throughout all major components. No matter what the exhibit element is, we find that people are most comfortable in an exhibit experience where there are multiple repeating elements whether they're animations or methods of displaying objects or labels, because by keeping this repetition, you're taking away some of the stress of the visitor. Instead of having to figure out these different elements time and again, they get used to seeing them and they say ahh, I know what that means, and they know what to skip and what to pay attention to. So the intro can help set people up for that system.

Bonnie Wallace, Independent Museum Label Writer and Editor

- **Predicted changes**
  - I expect people to continue exploring various multi-media approaches, exploring changing technologies visitors use, always trying to meet them where they are.

[Anonymous], Interpretive Planner & Content Developer at [Anonymous firm]

- **Goals**
  - I've worked on several larger projects w/whole team, where we define voice and tone and organization and media so even before coming up with ideas for intro text we have a framework and I would say goals for intro text are completely dependent on overall framework. And I think that the goals for intro text would depend on the needs of the project as well as the physical space, so your def included intro text being about the content being about visitors to think about what kind of topics they're going to encounter, *what is this about as well as what is the experience* like--sort of *tools for using the exhibit*, so sort of more logistical type things, and I think those needs vary depending on what the project is and where it is, so the goals would be "to what degree is this initial experience acting as a pre-organizer or not", and sort of "what do we know about the people who are coming to see it." Hopefully we've done some early evaluation, what is people's level of familiarity when they're approaching this topic, do they need like a background to get to the place or can we sort of jump not it right away so some of those things would inform the goals for the intro text.
  - I think that the question of who is the audience really informs the whole thing, and particularly the intro text.
- **Process**
  - This changes project by project, because of the team structure and because of what the project is, but I think everyone can be involved. In my role as the writer I sort of see myself as bridge between the designer and the content expert, the subject matter expert, who's often called a curator, and that everyone gets a voice. So the process would be often that we come up with this framework and then we draft some stuff and everyone gets to have an opinion. Which is good. And if we're asking visitors their opinion that's great too. And we do more drafts and see how it fits into that framework, whether it is just text, or how that text is working with the imagery and the media components and stuff like that.
  - [describes] a combo of a media experience that foreshadowed both the content and the experience, and it was repeated again at the intro to each section, but at the overall gallery intro, you get both imagery and text and a media experience where people are talking about their own experience, so hopefully a relatable entry experience.
- **Challenges**
  - If we're talking about writing, it's absolutely about being as concise as possible and reflecting the big idea in a very few number of words.
- **Predicted changes**
  - When I started we were getting control from curators and making it less about curators' own passion about their research. And a lot of times they used to just put that out there for people, the obligatory "here's what you need to know about this topic," and over course of my career it became much more about sharing — if you want visitors to appreciate something the way you do, it needs to resonate with them and it became much more about the visitors' perspective, being advocates for audience in developing intro text and the whole experience, and the trend is now much more about not US sharing and trying to have a conversation, *it's asking people what the conversation should be about.* Much more about creating spaces where visitors themselves are part of the process and product. You see it in all kinds of exhibits, when you use quotes and things like that, but I think hopefully we will continue to invite people, I mean maybe it takes the form of questions. That sort of prompting, inviting, what does this

have to do with you, that even to the next level of having that be part of the process. I'm talking about working with community groups before we even come up with big ideas, to sort of start building relationships and asking questions and deciding things together.

Appendix D: Storyteller Interview Instrument

INTERVIEW FOR STORYTELLERS

1. Briefly describe your work and the role storytelling plays in your work.
2. How do you define storytelling?
3. How do you define success in terms of reaching your audience(s)?
4. What's your approach to making visuals and words/text relate to each other, if applicable?
5. In a few sentences, could you describe how you structure your overall narratives?
6. What are one or two approaches you've found to be successful in drawing your audience into your stories? In other words, how do you "hook" your audience?
7. Do you try out (or "prototype") different entry points or "hooks" to your stories? If so, could you describe how this works and who is typically involved?
8. What do you think museum exhibition development/design teams could learn from your work about attracting and engaging visitors at the beginning of an exhibit?

Appendix E: Label Script for Soil Signage Prototyping

Soil Signage Prototyping
Label Script
03.29.19

Title

All-American Soils
Find your home earth.

Floor treatment text

America thrives on 19,000 kinds of soil.
Each is unique, with its own history and hidden layers. Soils support the ground we build and walk on, and our food supply depends on them. A closer look at soil helps us plan for future growth.

Intro sign text
body copy

Soil has layers.
Called "horizons," they're the visible evidence of soil-forming factors at work—climate, organisms, topography, parent materials, and time.

Soil cores tell us which crops can grow where.
Scientists and farmers look at layers in "soil cores" to figure out where and how to plant certain crops. The cores help answer these questions:

Does this soil have enough organic material?
Plants thrive in soils filled with life and decay. Worms, fungi, bacteria, and thousands of other organisms might live in and around the O horizon.

Is it firm enough to support a crop's root system?
Roots need topsoil that's dense enough to keep them in place, but porous enough to soak up water and air.

Can enough air and water filter through?
Plants need soil that's around 50% air. Bigger particles like sand let more air and water in, while tiny clay particles stay packed together.

Does it have enough nutrients?

Nitrogen, potassium, and other essential nutrients break off of the soil's parent material, get packed between clay particles, and leak out of animal waste. Every layer can spread nutrients in different ways.

Intro sign text
sidebar copy

O

The organic layer of decomposing surface matter.

A

"Topsoil"
A mineral-rich layer with some organic matter.

E

A layer of loss, as water carries clay, iron, aluminum, and organic matter into lower levels.

B

A layer of gain, as minerals and organic matter wash in from higher layers or form in place through weathering.

C

"Parent Material"
A mineral layer mostly unaffected by the processes above.

Text for Missouri state soil case
(to be vinyl-cut and overlaid on case with dashed line outlining the E-horizon)

Menfro's E-horizon is a layer of loss, where clay, iron, and aluminum are washed downward to the bedrock.

E is for Eluvial, which basically means "loss."

Text for graphic surrounding soil core interactive

body copy:

Sharkey

Clay-packed Sharkey doesn't drain well—
which makes it perfect for growing rice.
Farmers flood this soil as a way to keep
weeds out of their rice fields.

Question:

Why do you think this soil is sometimes called "gumbo"?

Answer:

Sharkey is thick and slick like gumbo stew.
It's common all along the Mississippi river.

Photo caption:

Sharkey is flooded for rice crops all along the Mississippi.
After harvest, the grain-filled waters become a haven
for birds.

Appendix F:
Conceptual design for introductory signage prototyping session

Following are the pages of a document shared with the SLSC team for communicating what would be prototyped/evaluated.

Soil core interactives | Label system / Mock-up of design, for prototyping | Angela Mele 03.25.19

Hole to be cut in circle for soil core

Body copy describes how the soil is good for the plant, and/or management practices

Photo gives sense of reality and context; sometimes helps answer "Question"

Caption relates photo to other content

Question more or less directly relates to ways the soil is good for the plant, or management practices

Soil core interactives | Label system, cont. | Angela Mele 03.25.19

Photos
(give a sense of realism and context)

"Questions"

Why would farmers plant cover crops in fields with this soil?

Why do you think this soil is sometimes called "gumbo"?

Captions

Photo: Sharkey is flooded for rice crops all along the Mississippi. After harvest, the grain-filled waters become a haven for birds.

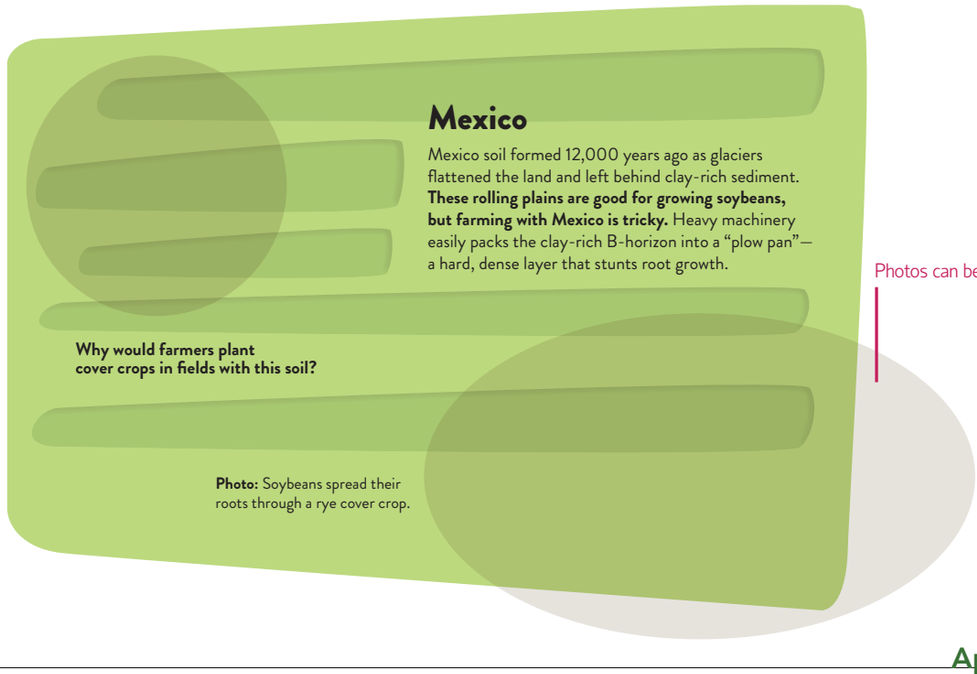
Photo: Soybeans spread their roots through a rye cover crop.

"Answers"

Sharkey is thick and slick like gumbo stew. It's common all along the Mississippi river.

Cover crop roots grow through Mexico's dense B-horizon, making channels for crop roots.

Soil core interactives | PDF of mock-up graphic | Angela Mele 03.25.19



Photos can be changed out

Soil core interactives | PDF of mock-up graphic | Angela Mele 03.25.19

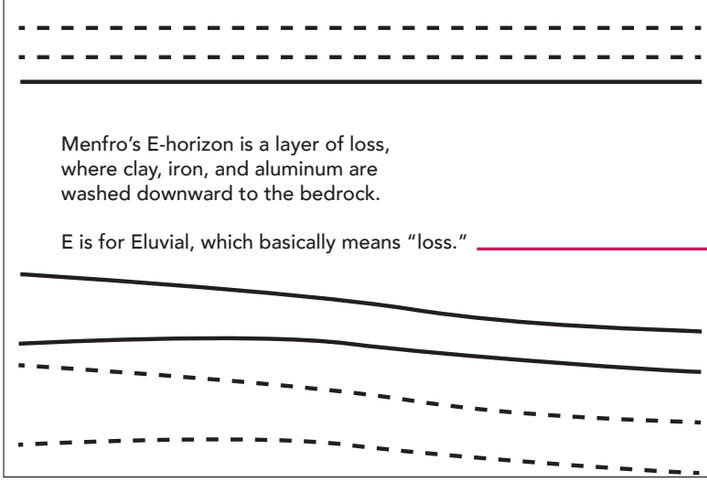
Sharkey

Clay-packed Sharkey doesn't drain well—which makes it perfect for growing rice. Farmers flood this soil as a way to keep weeds out of their rice fields. After harvest, they flood it again to provide resting areas for migratory waterfowl.

Why do you think this soil is sometimes called "gumbo"?

Photo: Sharkey is flooded for rice crops all along the Mississippi. After harvest, the grain-filled waters become a haven for birds.

Wall of Soil Cases | file to be vinyl-cut | Angela Mele 03.25.19

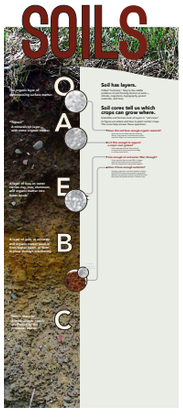


This text and lines will be cut out of white vinyl and stuck to the Menfro soil case. The text provides a concrete example of the "layers" concept established in the intro text and reinforced in the soil core interactive.

I gave some options for lines to use, to clarify for visitors where the "E-horizon" starts and stops.

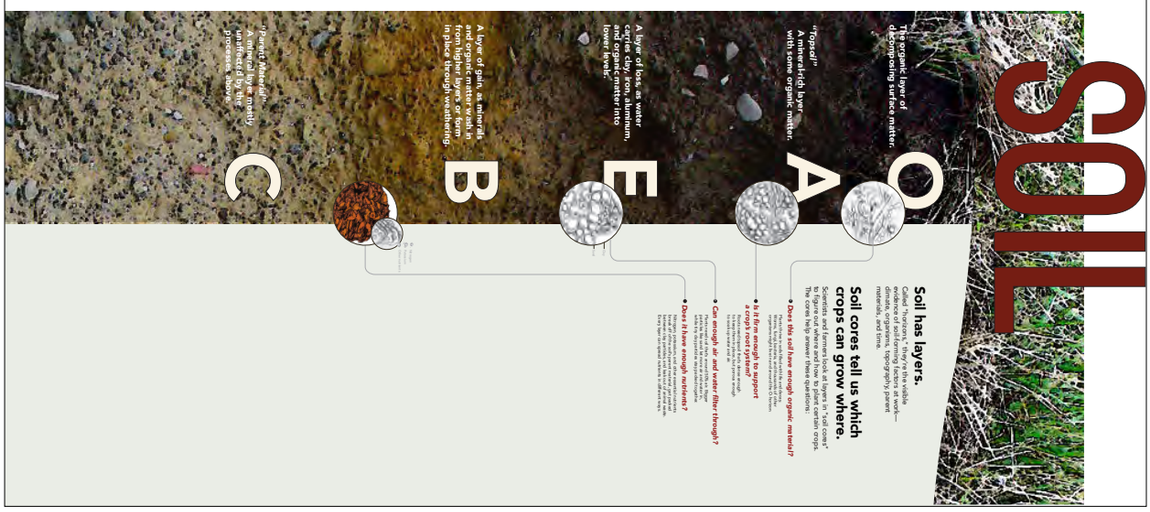
Wall of Soil Cases | title option | Angela Mele 03.25.19

ALL-AMERICAN SOILS *Find your home earth.*



"All-AMERICAN" could be dimensional, routed-out letters that sit atop the soil cases and lead into the word "SOILS". (note: this old sketch uses a different title)

Intro panel options | 7'x4' option | Angela Mele 03.25.19

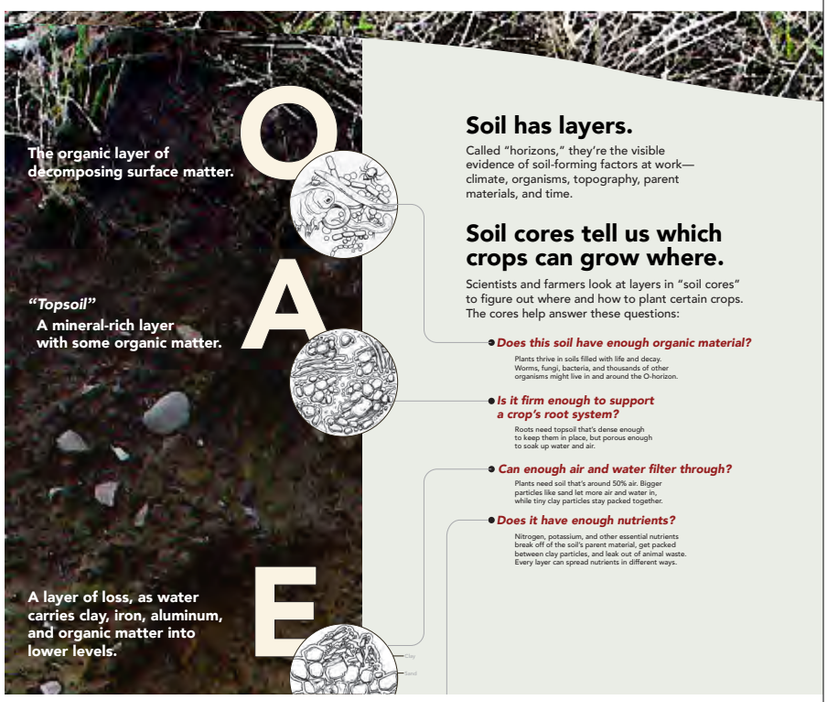


Intro panel options | 7'x4' option - detail | Angela Mele 03.25.19

The text and images describe soil layers and emphasize how we can look at specific aspects of the layers for crop management.

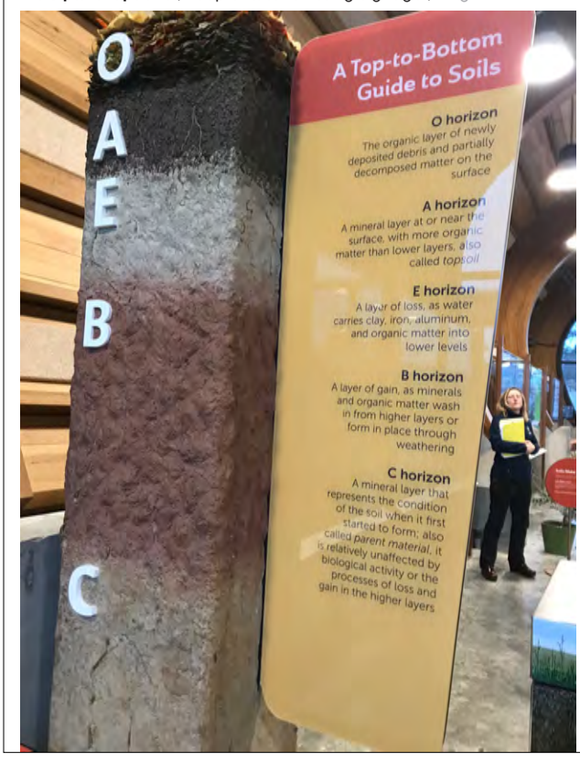
I will color in the illustrations after printing.

The tall gray shape could be made of concrete and could sit atop the existing concrete structure.

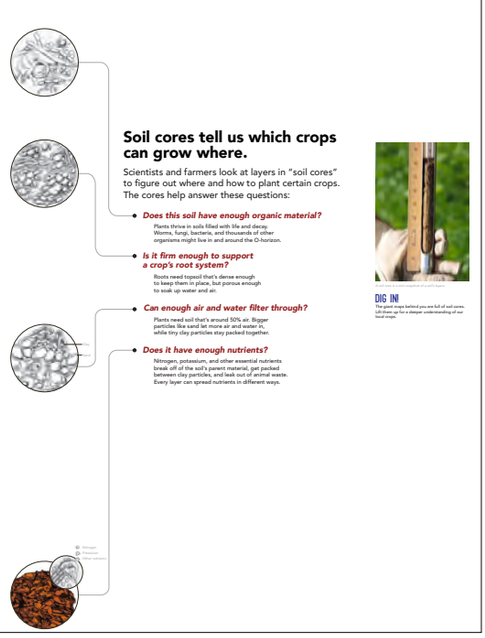


This will be cut out into the shape of a patch of soil and adhered to the floor.

Intro panel options | keep or alter existing signage | Angela Mele 03.25.19



Existing model/text could stay, with possibility of switching out text and graphics on reader rail to relate more to soil cores and soil cases. Some version of the below content could be added.



Appendix G: Evaluation instrument for prototyping

[Intercept after Pavilion entrance]

Hi, would you like to be an exhibit designer today and help us with one of our latest ideas?

If yes: *Great, follow me* - ***So had you been in the pavilion before?***

[Introduce team] *We are trying out a new way to arrange our soil exhibits in this space. I'd like you to pretend you are just coming up to "this" area as if we weren't here; spend as much or as little time going through it, and when you're done I'd like to ask just a few questions.*

Total time spent:

NOTES [Write down: Where are they looking, what are they doing or discussing or asking]:

What was your initial impression of "this" area? What popped out at you? [Prompts: *What about that caught your eye?*]

If I said this "area" was trying to communicate a big message about soil, what would you say that message is? [Prompt: *What piece of information (message) might you remember or take away from your reading?*]

If "this" was the start of a larger exhibition about soil (like an entrance way), what would you expect to do, see, learn about in that space? [Prompt: *What would you expect that larger exhibit to have in it?*]

Now let's look at something specific on "this." ***What would you say these letters are about?*** [Prompt: *What do you think the designers are trying to get across by having those there?*]

Thank you for helping with our research into how we design these types of spaces. [Give them a soil sticker] *If you have a few more moments we are also interested in your opinion on our newest prototypes over here and how well they connect to this area.*
[If no – *thank you again for your time*; give them the data sticker and explain if they wouldn't want to be approached for another one of the studies going on today to wear it; If yes…]

[*Thank you – just come on over here. So we are also redesigning these soil interactives,* ***had you played with them before?*** _____*ok, go ahead and please try it out and I'll ask you a couple questions about your experience afterwards.*]
NOTES [write down what they're saying/doing/questions they ask]**:**

Usage: Throttle intuitive: Y N
Touch core: Y N
Yank on core: Y N

What do you think the designers hoped to get across to visitors with this exhibit?
[Prompts: Was there something new you learned? What popped out at you the most?]

About soil? [Did you know that already or… where did you get (read) that from?]

About plants?

What connections (similarities) **or differences do you see between what you read and saw over there and this soil core?**

What ideas or suggestions do you want to share with the designers? What parts do you think might be confusing to other visitors?

Appendix H: Evaluation responses from prototyping session

Date/ start and end time	Info about group	Have you been in the Pavilion before?	Notes: what they're doing etc.	What was your initial impression of this area? What popped out at you?	If I said this area was trying to communicate a big message about soil, what would you say that message is?	If this was the start of a larger exhibition about soil, what would you expect to do, see learn?	What would you say these letters are about?	SOIL CORES: notes about what they're doing	What do you think the designers hoped to get across with this exhibit?	About soil?	About plants?	What connections / differences do you see between what over there and this soil core?	What ideas/suggestions do you want to share w/designers?
Fri. 3:40 - 3:52	Mom, 40s; Boy, 9; little girl; dad comes later	No	CONNECT TO FAMILY (FARMER). DIFF SOILS GOOD FOR DIFF THINGS: Daddy'd be able to tell you about this (what soil cores tell us about which crops). He's a farmer.	LAYERS: Parts of the ground (points at ill vitrine.) ("What pops out about the sign?") layers, leaf litter... oh so that's where you stand and then it goes down and down...	DIFF SOILS GOOD FOR DIFF THINGS: Boy shrugs; mom asks if they're all the same. Mom: "yeah, we're farmers. so it's all 'in this area you grow this kind of stuff, etc.' - so soil makes a difference."	Mom: well, I'd think it'd be something related to ground and all that.	THEYRE ABOUT LAYERS: Mom: well, I was trying to figure... Dad: diff layers. Dad: Mom: well, yeah. but what do letters mean? Get organic, but the rest? know topsoil.	Mom- so that's showing you what all under ground. (at A2 level) - "oh you've stepped in a lot of that thick stuff, by river bottom.". (Throttle intuitive - No. "How do I... is that all it goes?")	(didn't say much)	Kid - "changing colors" Dad: "not all the same; layers"	Diff crops grow in diff soils better than others.	LAYERS: DIFF SOILS GOOD FOR DIFF THINGS: Again, still got all different locations (on the wall) so this is one location and what it looks like. And the different layers.	SOIL ORGANISMS: Some worms and bugs at the top, and make the switch go up and down instead of side to side.
Didn't write down	Didn't write down	No	VARIETY: Explains to son, it's about what soils look like in diff. states. 2 ladies, pointing and talking and laughing w/2 kids around 8. "Idaho! potatoes! Virgin Islands? who lives there?" Should put samples of what produce grows here." kid touches model-sign. "State flag, how to pronounce"	WOULDN'T HAVE NOTICED; WANT MORE INTERACTION. Not much. Would've walked through. Staying with the earth tones and stuff. I get that, but for kids, need video game or something.	VARIETY: What does your dirt say about your state? / "diff types of soil". "the smell." "Which has more clay in the mix...like for puerto rico, thought there'd be more sand.	DIFF SOIL GOOD FOR DIFF THINGS, SOIL ORGANISMS: What you can find in the ground, bugs. what grows in what type of soil. Something interactive. Ground worms.	DON'T WANT TO READ: Don't know, would have to read. So do letters mean O for oxygen, etc? (They're not reading)	Kid pushing it up and down and making it move faster.	DESCRIBE THE SOIL, GET ATTENTION. I think point was just to grab their attn. Good description - thick, slick, gumbo stew.	It's how it's holding water.	About what type of crop can grow there. You need soupy soil.	DIFF SOIL GOOD FOR DIFF THINGS: Which soil is best for crops - real dark soil moreso than clay.	LIKE INTERACTIVE: Definitely like the interaction - need something to handle.
Fri. 2:45 - 2:56	Very briefly / couple yrs. ago		COLORS: Mention colors of soil. Stand there pretty quiet, a little distracted by video noise. (1.5 min.)	DIFFERENT SOILS ARE GOOD FOR DIFFERENT THINGS: What each kind of soil is best for. Lots of differences in texture.	VARIETY: Soil is very different depending on where you are. Even MO and IL next to each other, how diff. they are. (We're from MO.)	DIFF SOIL GOOD FOR DIFF THINGS: Panels all on diff sides of you - one goes more to gardening, one to ag - and diffs in soil show what you can do in diff parts of country - or activites, and what you can do in ea. area.	THEYRE ABOUT LAYERS; CAN TELL FROM COLORS TOO. Correspond to what's above. Try to pull up w/rice topper, then use lever. He also reads Mexico text. She stopped right at bubble then continued. Throttle not intuitive.	She tries to use the one in map. They were also going to try to pull up w/rice topper, then use lever. He also reads Mexico text. She stopped right at bubble then continued. Throttle not intuitive.	MAKE THE CONCEPT INTERACTIVE: Love the more 3D - has more texture than over there. And it's showing layers again, cool. Not as much color deviation as over there.	Words match how it looks; looks wet.	"about plants?"... (pause to read) - "well, flooding to keep weeds out is unusual.	INCONSISTENCY IN LAYER LABELING: This has "A1, A2", and it doesn't have that over there. And this one has no "E" layer - so maybe an explanation about that.	FIX:LAYER LABELING CONSISTENCY : Mostly the letter thing. Put that explanation with the core (not with the intro.)
Fri. 3:20 - 3:32	1 lady, microbiologist in 30s			LAYERS AND VARIETY: The variety. Diffs between vermont: colder on bottom (she knows that already); diff layers between.	VARIETY: There's a wide variety of soils.	INTERACTIVE W/LAYERS; DIFF SOIL GOOD FOR DIFF THINGS: Interactive where you're looking at diff layers. Introduce diffs of layers first, then go to actual soil cores and say "plants states have a lot of xyz" and group them by what grows there.	SOIL SCIENTIST DOESNT CARE MUCH BEYOND O: For someone who's never seen this, probably confusing, and I myself never thought too much about it beyond O.	Not too intuitive; tried to pull up.	EXPLAIN LAYERS. DIFF SOIL GOOD FOR DIFF THINGS: The thickness of different layers and what kind of Crop grows well with each.	How deep for crops-- not just top layer, but the importance of the rest too.	Right now, just rice.	INCONSISTENCY IN LAYER LABELING: This one really is just A, oh, and B--but where's O and E? So if you're teaching, this is how it's always done' it could be confusing.	No
Fri. 3:05 - 3:20	2 people	No; 1st time at SLSC.	Kid goes and looks at label and vitrine. Dad stays back. Kid looks at labels pretty diligently.	VARIETY: Red and black colors catch eye from entrance. "States. that's cool - different w/each state; 'what's it like in your state'..."	VARIETY AND LAYERS: Difference. and it gets more interesting as you go down deeper. More dots and stuff (texture.)	AGRICULTURE & HISTORY: A lot of agriculture and history stuff.	IT'S ABOUT LAYERS; To let you know diff. details about diff layers - dunny why it says OAEB but as you go down, guess that makes it easier to name.	(They raise it up and say 'yeah, really interesting; more hands-on.' Throttle intuitive.	MAKE THE CONCEPT INTERACTIVE. DESCRIBE THE SOIL: Trying to make it more fun--can see and touch, not just behind glass. Yeah, says sharkey's sticky like gumbo.	Soil's different colors; lighter on the bottom.	Just that it's rice.	INCONSISTENCY IN LAYER LABELING: See A&B, but no E like over there. And this measures it here; not over there.	No
Fri.	Young kids; mom 40s	No	VARIETY, COLOR: "Which is state we live in?" [Jill,] "that's our ground. Color? Hannah's state? [NY] Looks similar. Which is darkest?	VARIETY: Geography, where people/animals/people connect to people. Different states they're from. Names of states.	VARIETY AND LAYERS: Differences in different areas, sometimes top part is darker, or dryer at the bottom, like Alaska... richness...	DIFF SOILS GOOD FOR DIFF THINGS. I'd wanna know, what can I do with this soil? Like, where does it come from? Is it good for growing or is it not? Want to organize them--can I look by region, by density?	NOT SURE: Not sure. Probably a technical term whorizon--just looking at composition and assuming there's something I've heard 'horizon' before.	Kids point at bubble and peel (7yr old) That's about mud stuff. Mom: "goes up and down."	MAKE THE CONCEPT INTERACTIVE: Gives better sense of depth and IN THE ground.	I thought gumbo stew--has meaning for me. Analogies stick in my mind!	Importance of what they're tapping into.	DIFF SOIL GOOD FOR DIFF THINGS: Core - about plants and what they need from soil--and that's geography and different ecosystems--plus core about glass & soil. And can see & touch on glass. Would want to know how vitrines are organized.	MORE ON WHAT PLANTS GET FROM SOIL: Why are these spaces bigger than that? Would be cool to see what plants are PULLING from soil. We've been tapping maple. Glare on glass & hard on eyes. And can see & touch on glass. Would want to know how vitrines are organized.

Sun. 1:04 - 1:16	Couple in 20s	?	COLOR: Look at Vermont, touch, read, point at Menfro layers, touch & read. Point at "Find Your Home", wander past layer model to other soils wall. They like very red Alabama and rocks in Pennsylvania.	VARIETY: They're all different. Not the same - wherever you go, find new discoveries.	Not sure.	DIFF SOILS GOOD FOR DIFF THINGS, INTERACTIVE: To learn diff soils have to offer - what's underneath, what plants grow where. What place has to offer--each state v. diff, and even underneath, nothing's the same. To feel all of it. And IL next to MO, totally diff. and dark.	IT'S ABOUT LAYERS: Diff stages of soil the further it goes down.	They squat down. "gumbo stew; thick and slick"	dunno	dunno	I can see it's about plants but not getting msg I guess. The flood part stuck out, but connectio n to plants not really.	REAL' VS. DEAD/FAKE: The core looks wet, those over there look healthy	none
Sun. 12:42 - 12:55	Group of 5, parents in 20s-30s and several little kids, dwindles to lady in 30s	No	"Wind-blown sediment" (dad goes bt labels w/kid, kid reads) "political, geologic history..." (girl wants to go to map) (6-7girl tries to read: "categorize")	VARIETY: Says "Find your home earth" - what other earth is there? Color, textures - interested in MO label, and the fact that Puerto Rico is there - little one pokes PR - "how diff each one is."	VARIETY, DIFF SOILS GOOD FOR DIFF THINGS: Different types of soil. Didn't know there was such a diff. and insight into what grows in what areas. The sign: what it takes to support growth in diff. layers.	Setting you up to look at display here.	JUST LOOKED AT O: Didn't really think about it. Read about O; hard to follow organization.	(Sara asks lady in 30s to read) "answer would've connected to main text description" (throttle not intuitive; tries to pull plant)	DIFF SOIL GOOD FOR DIFF THINGS: Why farmers plug their soil, for rice in general	Not really new to me.	No, not much	DIFF SOILS GOOD FOR DIFF THINGS: It's all soil-related--how things are grown most effectively, efficiently. (diffs?) I think they go well together.	Satisfied.
Sun. 12:09 - 12:24	Mom, dad, 11-yr-old daughter	Once.	COLOR: They talk about Puerto Rico, "look at Idaho" and points, "volcanic eruption." Point at Alabama's red gradient.	VARIETY, DIFF SOILS GOOD FOR DIFF THINGS: All soils different - can grow different things. (closer to sign) - "soils start 1 color and change as they go down. Some of bigger states have diff soils from smaller ones.	VARIETY: All part of 1 big group - but then diverse. Mom: as diverse as people, right?	DIFF SOILS GOOD FOR DIFF THINGS: Diff plants growing in diff soils - live plants too.	IT'S ABOUT LAYERS: To show diff layers in soil. (didn't read while walking around) - catches eye? "each layer's differeing; looks kinda fake--so many diff types of soil in one.	Mom reads main text - "so when you go hunting with daddy and see rice fields for birds, that's this soil, that's in our backyard - that sticky wet mud." (kid) "yeah I go in old clothes and slide in mud." "So that's cool, that's exactly what they do to go hunt."	MAKE CONCEPT INTERACTIVE; ABOUT LAYERS: That you can go up, and if you dig far enough, still diff layers, textures, diff things in it. Lines help you see it better - it's more 3D, touchable, more real.	Mom: "you learned how they get birds to land in refuge. And why YOU can't have the refuge."	This certain plant's growing in this soil, but probably could be in a LOT of different soils--as long as the top is the same.	SPECIFIC VERSION OF BIGGER AREA: Kid - taking what you saw over there and seeing it come to life here. Mom: see just a little about Missouri over there, but then here it's all about the local stuff. (And the differences?) Kid: go hand in hand - taking what's there and putting it into a new perspective.	MORE ON DIFF SOILS GOOD FOR DIFF THINGS: Knowing what plants grow better and seeing real ones -- that would be cool. Question about organization of soil (but then they realize that wouldn't show diversity as much)
Sun. 2:17 -	3 ladies, in 50s, teen, 20s	No	COLOR: They all go to diff vitrines. They like red gradient in Louisiana and gradients in general	VARIETY: Colors (x2). Title: it's about all the soils you see in the US. (closer to sign) "like layers, diff minerals in diff sections. Getting from image and text, esp. now that we've already noticed the gradients.	DIFF SOILS GOOD FOR DIFF THINGS: Figuring out best crops to use.	INTERACTIVE, LAYERS, DIFF SOILS GOOD FOR DIFF THINGS: Play in the dirt, feel diff. layers. Seeing what grows better in what plants. (what questions would you have?) uniqueness, change from one state to next.	NOT SURE: They're not ABCD - wanna know what they stand for.	(as it raises) "I was trying to think, cause gumbo's a mixture. Figured core would say something." (Throttle not so intuitive)	DIFF SOIL GOOD FOR DIFF THINGS: To give idea of why soil in this area is for growing what.	Rice probably grows better in that soil.	(blank)	LAYERS; INCONSISTENCY IN LABELING: Same - layers. difference: layers labeled differently. These are alphabetical. A-B looks alphabetical. (One lady likes a pure gradient without lines; one likes the lines.)	FIX LAYER LABELING: Confused about core layer/numbers. Confusing that they're separated when it says they're all mixed together like a stew.