Rethinking Authority and Visitor Agency
(without breaking your museum)
New York Hall of Science

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About This Facilitation Guide

This guide is based on a three-day conference held at the New York Hall of Science in May, 2019, with support from the National Science Foundation. Although many NYSCI staff were involved in creating and delivering this experience, this guide is written from the perspective of our two facilitators, Dana Schloss and Priya Mohabir. We begin with brief reflections from each of them about their own experiences exploring these important, and sometimes challenging, aspirations for making our science centers more inclusive and meaningful spaces for all learners.

Dana's Note

I grew up in a Jewish family where conversations, questions and curiosity were the basis of our relationships with each other and our understanding of the world. Our family dinners were long, drawn out debates, sometimes about movies or books, but also about big questions — why do systems work the way they do, why are power structures the way that they are? Nightly conversations were settled through debate, or often by consulting the *World Book* encyclopedia, David Macaulay and Neil Ardley's great *The Way Things Work*, or *Leonard Maltin's Movie and Video Guide* (depending on the topic).

As a young adult, I found my way into museums working as a carpenter. I was thrilled to build things related to learning, rather than theater sets or additions to houses. But I was also young and queer, and I didn't look like most all-male exhibit teams' idea of a carpenter. I am tiny, excitable and curious, and they thought I fit the mold of a floor staffer, and not the carpenter they were looking for. So I started working in museums as floor staff, and I did construction in theater, TV and houses on the side as gigs came up.

When I was trained to be a facilitator I was always drawn to inquiry and constructivism, ways of thinking about learning that described the kinds of experiences I had had in those debates and discussions with my family as I grew up. I assumed everyone else was enthusiastic about these ideas too. It took years and many, many interactions with frustrated parents as I prompted them with a cheerful, "I don't know, how do you think it works?" to realize that not everyone was interested in figuring things out on a busy museum floor.

At the time, this genuinely shocked me. Some visitors just wanted to know the answer, and that made me uncomfortable. Some people — a lot of people — wanted to know "what am I supposed to learn here" before they'd play, or read a label, or explore an exhibit. I hated that. My brain would scream, "The exhibit is trying to show you! Just look!" I didn't want to tell them the answer. It felt wrong, like I was doing them a disservice. "This is informal learning!" I would think — "you can explore to your heart's content!" Why would I take that experience away from our visitors by telling them what they were supposed to learn? I thought I was being good at my job. But I also knew there were a significant number of visitors who really didn't like it when I would skirt around their questions, trying to convince them to find out for themselves. This was all too clear when, after I asked them a question in response to their question, they just walked away.

After hundreds, maybe thousands of these interactions with visitors, I started to internalize some things. (It takes time, and a lot of evidence, to change your mind about something you assume is fundamental.)

Unless it is really clear what they will be experimenting with, visitors usually don't want to figure it out themselves. It's actually off-putting to ask visitors to figure it out themselves.

I am a person who will just try something. And I shake failure off easily (at least the informal learning kind of failure). If someone doesn't like an idea I have, I do not take it personally, I just come up with another idea.

But now I know that this isn't how most people are. And just because we here at NYSCI decided to value risk, failure and figuring it out doesn't mean that it's okay to expect people to leap into those experiences on their own. There is an arrogance in expecting that, for example, you'll want to share your idea with me, because I told you about mine. It is arrogant to assume that a visitor will "just play" with an inexplicable piece of furniture that is supposed to teach them a science concept that they didn't ask to learn. Just like in real life, it's arrogant to ask visitors to take the risk of sharing their opinion or an idea, before they see that behavior modelled — by floor staff, or within an exhibit itself. Who converses like that? No one. But most of our museums do.

Asking "what am I supposed to do here" is a very logical and reasonable place for a visitor to start a line of inquiry. So now, I just answer the question. I answer it in every way I can imagine someone asking it. Through pilot testing and prototyping, we can ask how people need to be reassured they are doing the right thing. Through design, materials, instructions, and facilitation, we answer them.

But that's just the one example. I was excited to participate in this conference because we, science center exhibit creators, design so many interactions as if they are universally understood. But they aren't, for many, many visitors. There are a million moments when museum experiences tacitly expect the visitor to "just understand" — to recognize opportunities for inquiry, to pursue learning through objects and observation, or to equate a floor plan to a story. We forget that learning in museums is a form of literacy, and some of us learned to parse it and some of us didn't. Because of this, it's exclusionary to assert that an experience is easy to understand, when it's so apparent, if we pay attention, that so many visitors don't know how to read our design language.

Through this conference we were able to analyze and explore these challenges. We sought to identify the casual assumptions that lead us, as museum designers and educators, to expect that our visitors will routinely accept our invitations to "just explore." We tried to look directly at the many moments when we hear their perfectly reasonable question, "what am I supposed to do here?" and brush past it like it wasn't asked at all. Too often, we still answer with "I don't know, what do you think?" We hope that this guide will help you and your colleagues to consider the questions your visitors are asking. Because most visitors need to know the answers to their own questions before they are comfortable exploring ours.

Priya's Note

When I was asked to help facilitate this conference, it was such a welcome opportunity! Facilitation is an aspect of my work that I deeply enjoy, but over the years I have had less and less time for it, as I stepped into positions that focused more on professional/ youth development, program design, and operations. This conference required us to create an environment that would allow the group to question our assumptions, build new understanding of the intersectionality of the world around us, and help us through a process of self reflection (or self realization). We needed to offer participants opportunities to be creative, thoughtful, and to take risks.

Together, Dana and I did this by bringing our different perspectives and experiences to the table as examples, drawing on our own experiences of being invited (or not invited) into museum spaces, but even more generally, the invitations we had received, throughout our lives, to question the world around us.

When I was a four year old girl, my family moved from Guyana, a country in South America where we lived in a rural village, to the sixth floor of an apartment building in the Bronx, New York. With two working parents, babysitters were a constant in our young lives. One of the most memorable was Maria, a Puerto Rican woman who would make us cafe con leche in tiny cups while we ate our snack at her kitchen table. When we moved into a house in Queens, I started walking home from school with my younger sister. We'd grab a snack and wait until my dad got home to help with homework. I was 8 and she was 5. As a parent now, I can't imagine having my kids do this, but at the time it seemed natural. I was older, my grandma and aunt lived down the block, my uncle upstairs, and it was just an hour until my dad got home.

When Mom got home, she'd get dinner ready, often serving us food as she cooked to allow time for night time routines and bed. As the oldest of three girls, growing up was filled with a lot of responsibilities, not because my parents said so, but because I felt the need to help. This was just one of the ways I could contribute to our little family. This is just a little snapshot of our lives at a point in time that would lay the foundation of our family roles as I grew up. We had an efficient little process to make sure that things kept going smoothly.

When I was a senior in high school I started looking for a job that would allow me to earn money to help cover some of my upcoming college expenses. At the time, a family member was working at NYSCI and connected me with the opportunity to become an Explainer. I had no idea what the role would involve, but I was pre-med in high school and taking lots of science classes, so I thought it would be a good fit. My parents like the idea too! Math and science were highly valued school subjects in my family. They were seen as a body of knowledge, based on facts that we learned from teachers at school. They held the knowledge, and I needed to learn it. There was never an invitation to question these facts - to do so would have been a sign of disrespect.

Similarly, I saw museums and science centers as places that held and shared knowledge, places of authority that helped to make you smarter.

After working at NYSCI as an Explainer for a few years, I had learned how to invite people to bring their own experiences into their learning. But my training still emphasized the importance of that nugget of information, the facts that you wanted to leave visitors with. I was still part of a system that was focused on delivering information to visitors. While facilitating this conference, I remembered an experience I had early on as an Explainer that highlighted my focus on sharing factual information. I had noticed that the signage of an exhibit didn't match what I was learning in school — it was actually wrong. But I didn't feel comfortable pointing it out. Was it even my place to correct the museum? Who was I to question the experts that created that exhibit? It was my role, I believed, to engage visitors with the exhibits, not to contribute to their content. I shied away from that exhibit for years, rather than confront the idea that I could challenge the information written on a little piece of plexiglass. It has taken years of working in informal science education to understand that truly good learning moments are the ones when you know you are contributing to something larger than yourself.

The opportunity to co-facilitate this conference has helped me to recognize the value of my voice, experiences, and perspectives. I know that I don't always have to have an answer. Creating opportunities to challenge our ideas is a part of our own learning as museum professionals, and helps us to push the boundaries of how we go about inviting others into the amazing experiences museums and science centers can offer.

As you go through this guide, I hope you will take a step back and think about your own first steps into a museum. Did you feel welcomed? Did it feel like a place that was meant for you? In your professional role, creating experiences, exhibits, programs, or workshops, what are the assumptions you make about your audiences? These assumptions are not coming from a negative or judgmental place, but from your own experiences of the world. To create experiences that are truly inclusive we need to step out of considering the kinds of things we might enjoy, or how we would tackle a challenge, and think about whether and how those strategies might actually be a barrier for others.

This guide transitions the in-person conference that we did with colleagues from multiple sites, into a workshop that can be done in a single institution with a smaller group of participants. Throughout this guide you will find little notes from Dana and me, offering our insights about how and why we approached the facilitation of these activities in the way that we did. There were many moments of reflection, points where we agreed, points where we trusted the expertise of one another, and points where we turned to the participants to help guide our next steps. It took moments of vulnerability, not just personally, but as an institution, to invite others into a process where they could safely reflect, challenge one another, and try new ideas. We invite you to make your own adjustments, trust your colleagues, and use this guide to help you create an opportunity to grow.

Introduction

How can we begin to chart a course toward a future for science museums in which we maintain our status as sources of trusted information, while also fulfilling our potential as sites of genuine participation and social interaction? In 2019, with funding from the National Science Foundation, the New York Hall of Science hosted a three day conference to discuss new and equitable approaches to exhibit design. With leading exhibit designers, educators, researchers, and community engagement specialists, we began to rethink the exhibit design process, toward a goal of helping our museums become more inclusive and equitable for all visitors, and to increase opportunities for visitors to express their agency as scientific learners and doers. We discussed what equity, inclusivity, and agency look like for visitors to our institutions;

practiced redesigning exhibits with these ideas in mind; and reflected on how our own experiences and identities influence our work in museums.

Through this process, we came to an important realization — we need to keep talking. We need to keep having context-specific conversations about how our individual institutions can better serve our visitors' diverse needs; how to make their perspectives central to their experiences with museum exhibits; and how to foster institutional cultures that value those experiences. To help others have those conversations, we created this guide.
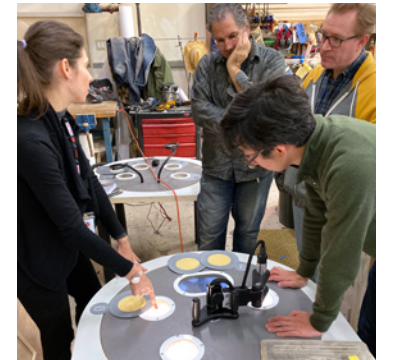
Who is this guide for?

The primary audiences for this guide are exhibit and program staff in science museums who are interested in assessing the inclusivity, support for visitor agency, and equitable access to learning that their exhibits provide to their visitors. Staff from all departments of a given institution are encouraged to participate in these conversations.

What is it meant to do?

This guide is a tool to help facilitate reflective conversations in your institution. These conversations are a step toward fostering an institutional culture that values equity, inclusivity, and agency in museum exhibits and programs. This guide will help your team to set common language, assess existing museum experiences, and take steps towards creating more inclusive practices for designing new exhibits and programs.

Why do we present it in this way?

We designed this guide to be responsive to different science center contexts, audiences, and constraints. Drawing from an educative curriculum model, this guide promotes flexibility and ongoing education for its facilitators, presenting an overall structure, tips for facilitation, and what we learned as we led this conversation ourselves.

[photo]

Gearing Up!

Creating the participant list.

Who's going to be in the room?

As you translate this experience to your institution consider bringing in participants from a range of departments. From each department, consider including three people who fill distinct roles:

- An anchor person who has experience thinking about inclusion, equity and/or agency in exhibits
- A disruptive person who will push people's thinking
- A novice who has not thought about this topic much before

Creating a shared virtual workspace.

Prior to the start of this workshop, set up a shared workspace to distribute and collect assignments, document the process of the group's work and share resources and materials. We used a shared Google folder for this purpose, but you can utilize whatever tools you have access to.

Identifying exhibits to focus on.

A central component of our conference was the exhibit redesign process. We used this process as an entry point to deeper conversations. Through the redesign process, participants tried out design strategies to make our museums more equitable and inclusive for all visitors, and to build opportunities for visitors to express their own agency. When we reflected on those redesigns, we were able to uncover some of the assumptions we make about how visitors learn. We leveraged the diversity of our exhibits at NYSCI to help us recognize how differences in design may impact how visitors feel included, recognized, or engaged. It gave the participants concrete examples to start from that laid the foundation for the more personal and reflective work we ended this experience with.

Identify what exhibits you may want to focus on as you take participants through this workshop. While it may be tempting to look at your museum as a whole, having a handful of specific exhibits to focus on will allow you to focus more on the process of the redesign, rather than the solutions and ideas the groups produce.

Pre-activities for participants.

To help participants get in the mindset of thinking about inclusivity, agency, and equity, our facilitators asked attendees to make a short video or zine about an exhibit, program or museum experience. Facilitators shared a google drive link with pre-populated examples, and invited participants to add their own contributions and view others. This prompt was shared with participants two weeks before we met in person.

Intentions:

Before we meet in person, we want to start getting in the mindset of talking about inclusivity, equity, and agency. During the conference, we will take close look at five exhibit areas, and discuss promising strategies to fulfill these three goals:

1. Make visitors' diverse and personal questions, concerns, and perspectives central to their experience of exhibits;
2. Engage visitors as contributors to the exhibit experience in ways that make their contributions visible and consequential;
3. Achieve these goals in ways that are responsive to the operational demands of busy science centers and their audiences.

To prepare us all for the discussions we'll be having next week, we'd like you to dig deep and think about an exhibit or experience that you have a close relationship with.

What we're asking:

Make a short video or zine about an exhibit, program or museum experience.
Did you experience it as a visitor?
An educator? Designer? How did you feel the first time you encountered it? Why do you think you felt that way?

Start by telling us a little bit about yourself and where you're coming from. Then, think about the inclusivity of the experience and address the following questions:

- How does it welcome people?
- How does it build agency?
- How is it inclusive, how is it exclusionary?
- If you were involved in making it: what was the process to get there?

In the "Pre-workshop Activities" folder, take a look at an example video and zine made by NYSCI staff.

Please feel free to start some conversations by commenting on your colleagues' submissions.

Setting up the space

Monitor for presentation: There is minimal presentation, but we used a video and a few slides to set norms and expectations and to share info through the conference. (Use it if you've got one, but don't sweat it if you don't.)

Provide maximum space between groups, at least 6' between tables.

Group Work Table

Pin Up Surface (Foam core or cork board)

Area to keep extra supplies:
Cardboard
Chart Paper
Hot Glue
Duct Tape
Cardboard Tubes
Miscellaneous Building Supplies

Food tables in an alcove (or adjacent room) so you can set food with minimal distraction.

(Food buffet in another room is ideal because it lets participants clear their head from their ideas by leaving the room.)
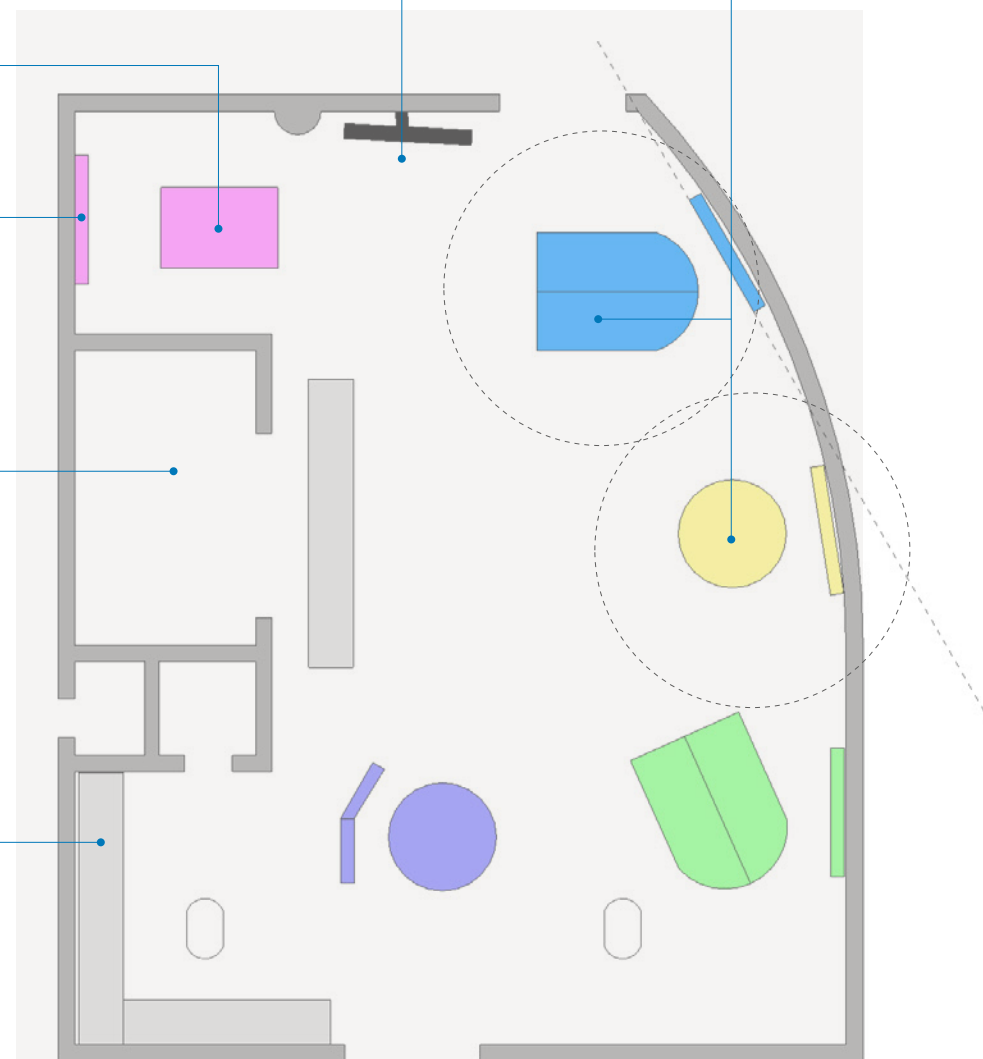
Supplies provided to each group:
A pile of large multi-colored Post-its
Pentel Sign Pens
Large Post-it Chart paper
Multi-colored markers
Reusable coffee mugs

Getting Down To It

This agenda was organized in three arcs. For the purpose of our conference, we executed the modules over two and half days. In the following pages we present a detailed agenda, and call outs that give context, suggestions, and tips for facilitation.

Module 1 — Question Your Assumptions
Duration: 4 – 5 hours

This module lays the foundation for the open and honest conversations we aim to have. Participants start to question some of their own assumptions around the design decisions they make to create engaging experiences in their museum spaces. Participants will:
· Create shared language and understanding around institutional values that are drivers for decision making.
· Get into the mindset of talking about inclusion, equity and agency, while creating an opportunity to expand on these terms.
· Acknowledge that risk-taking does not always feel safe to all, and pushing for it can be exclusionary and uncomfortable.
· Establish a sense of trust across participants as they share their own experiences.
· Develop a baseline experience that will allow participants to move on to deeper dives into the design process.

Module 2 — Reflection in Action
Duration: 6 – 9 hours

This module allows participants to go through the design process as they focus on building opportunities for inclusivity and shift agency to visitors. Through small group work, participants will:
· Examine the learning goals for the exhibits they are focusing on.
· Interview stakeholders to learn more about how exhibit spaces are used, establishing ways to value the voices of others as they redesign chosen exhibit areas.
· Develop re-designs of existing exhibits that increase opportunities for inclusivity, equity, and the expression of visitors' agency.

· Learn from peers, recognize the strengths of others on their team and challenge one another to reflect more deeply on the assumptions that drive their design decisions.
· Share their processes, decisions, and redesign with the larger group.

Module 3 — No, Really Question Your Assumptions
Duration: 4 – 5 hours

This module synthesizes the redesign process, highlighting the design practices that challenged our assumptions and created opportunities for different invitations and kinds of engagement around the exhibits. Participants will:
· Identify the design practices they employed in their redesign.
· Synthesize a list of design practices that recognized visitors' agency or shifted authority from the museum to the visitors.
· Dive into the why behind our design practices and expectations.
· Question their own assumptions of how others learn and find enjoyment.
· Reflect on the many ways we all might experience the costs or risks of making mistakes.

BIGGEST BARRIER (S)

ENVIRONMENT / SPACE QUALITIES

LIMITATIONS OF SUBJECT MATTER AS CURRENTLY USED / DEPLOYED

LINKING IDEA IS LOSS / NO BIG IDEA

DEVOLVED TO 'TOOLS' BUS REPETITIVE & WHICH ARE AUTHENTIC

Getting Ready to Facilitate

As you familiarize yourself with the arc and objectives of the workshop, you can begin to consider how you will approach facilitating this experience.

When preparing the meeting:

Asking the right questions — What assumptions are you making about the knowledge and experiences of the participants, of each other? How will you know if you are asking the right questions, both personally and as a team?

Agenda planning — What opportunities are you creating for participants to learn together, be actively engaged, reflect, and reset?

Communication with stakeholders — How do you start setting expectations about the kinds of work you will be doing together?

Organizing and project management — How are you distributing responsibilities and assigning roles across the planning team?

When facilitating the meeting:

Create an inclusive environment — What choices are you making to ensure that participants feel welcomed and included?

Group dynamics and group management — How are you putting groups together and creating opportunities for all participants to actively engage?

Empathy — How are you trying to understand the feelings and experiences of others? (Be aware that some participants have thought about DEAI in exhibits a lot and some participants have not thought about visitors through this lens before.)

Active listening — How are you listening and staying in the moment?

Synthesizing Information — What tools or processes are you using to pull out themes from feedback and conversations?

Manage timing — How will you stay on track, but give participants the time they need to build understanding and knowledge before moving forward?

Gauge the energy level of a room — What are cues you can look out for to gauge when to take a break or when to dig deeper?

Flexibility — How will you leave space for things to take a different direction?

Staying neutral — How do you allow participants to engage and set the direction of their discussions?

Recording outcomes — What tools are you using to record outcomes to share with participants?

Module 1
Question Your Assumptions

Welcome, workshop overview, and setting the stage

DURATION: 1 hour

OBJECTIVE: Develop a shared understanding of the problem we will focus on: visitors come to informal science education spaces with different experiences of personal agency. If we assume that all visitors already see exploration and failure as safe, we are actively being non-inclusive to some visitors.

DESCRIPTION: Facilitator gives a short presentation on the goals and motivations behind the workshop.

1. Make visitors' diverse and personal questions, concerns, and perspectives central to their experience of exhibits;

2. Engage visitors as contributors to the exhibit experience in ways that make their contributions visible and consequential;

3. Achieve these goals in ways that are responsive to the operational demands of busy science centers and their audiences.

Discuss the prior work at the organization that has shaped the goals and priorities for exhibit development in the past, and how that history may facilitate or challenge these goals.

> Overall goal isn't to redesign an exhibit, it's to use the exhibit design process to help identify principles of inclusion and agency, promoting exhibit design with a STEM focus. Not everyone has the same process, so we focused on sharing and learning from each other.

Facilitators should share a short presentation on the goals and motivations behind the workshop. Topics for this presentation include, but are not limited to:

· Your organizational values and how they are communicated to audiences;
· An example of a personal experience when your best design intents went wrong as you looked at your whole audience;
· Highlighting an example of being curious in the face of failure.

> Our example showed a NASA employee failing epically, getting curious, and trying again. We point out the entitlement that employee has and make a comparison to the difficulty many of our visitors have just choosing to try again.

Some participants were experienced at thinking about equity, inclusion, agency and authority in their work and others were not. This warm-up based on the pre-conference assignment helped the participants develop a language of talking about these attributes of their work.

The participants in this session know each other and many of them have worked together before. For this exercise we tried to separate people who had worked together so that no one could rely on a shorthand to discuss equity, inclusion and agency in their work.

Small steps to helping people consider the design choices they make, and why.

Discussion: Pre-workshop reflections, museum experiences

DURATION: 45 minutes

OBJECTIVE: Get to know each other and get in the mindset of talking about inclusion, equity and agency.

Form a common understanding of language (regarding the terms agency, equity, inclusivity and authority).

DESCRIPTION: These small group discussions allow participants to learn about the work of others and what they are proud of, and to acknowledge and identify other attributes for designing for inclusivity, agency, and equity.

· Break the participants into groups of 3 – 4 people and have them introduce themselves to each other — name, organization (if they are from multiple locations), and short description of their roles.
· Reference the questions that were sent to help them reflect on their museum experience:
  > How does it welcome people?
  > How does it build agency?
  > How is it inclusive, how is it exclusionary?
  > If you were involved in making it: what was the process?
· Participants can use the videos or zines created in the pre-activity as reference in this activity.
· Ask participants to listen for any design strategies they found interesting or insightful and make note of them.

Create groups that offer a variety of perspectives.

Considerations can include:
· Someone who has gone through the design process
· Someone that is a junior or novice designer
· Someone in a non-design role

Using small groups allows participants to focus on qualities and perspectives each individual brings to the conversation.

Facilitators should frame the conversation as a way to get to not only know each other, but to learn about other ways people see success in their work and design for inclusivity, agency, and equity.

· Reference the questions that were sent out with the pre-activity to help with framing.

During the small group discussions, facilitators should listen in on the groups and make note of any design strategies that are mentioned. In the debrief, these strategies and practices will be pulled together.

Offer the potential of support, growth and shift in understanding. We choose an *anchor person* who has experience thinking about inclusion, equity and/or agency in exhibits, a *disruptive person* who will push people's thinking, a *novice,* someone who has not thought of this topic before.

Question your assumptions

DURATION: 45 minutes

OBJECTIVE: Reflect on some of our own assumptions in a safe way. We will focus on the ways we interpret language and how we address issues of agency, inclusion and equity in our work. Recognize the variety of ways these ideas can be understood and addressed in our work.

DESCRIPTION: In the previous activity we made some assumptions about the language we were using to reflect on our own experiences. In what ways are ideas about agency, inclusion and equity showing up in our work? Do we all mean the same things when we use these words?

Ask 3 participants to share their ideas as a jumping off point.

Redesign groups — Getting started

DURATION: 45 minutes

OBJECTIVE: Participants will use the highlights from their prior conversations as a jumping off point to learn about their group's perspectives.

DESCRIPTION: Participants will move into new groups to debrief their introductory conversations and reflect on the kinds of design strategies that were highlighted.

Groups should start documenting the strategies that come up in their discussions for later activities, reflections, and conversations. Some questions that can guide reflections:
· Are you noticing any similarities across the design strategies or examples of work that have been shared?
· Who holds the authority in the examples you looked at?
· What opportunities do visitors have to express their agency?

The words agency, equity, and inclusion are often used without clear definitions or clear differentiation of one idea from another. Prior to the workshop you can ask three participants to be prepared to share how they think about these terms to generate a group discussion.

In our conference we had experts in the room and drew on their knowledge, but facilitators can bring additional viewpoints into the discussion that would allow participants the opportunity to step back and start questioning the kinds of assumptions they might be making in their own work.

Set-up: Put out larger poster paper, post-it notes, and markers for groups to use to debrief.

Once again, create groups that offer a variety of perspectives. Considerations can include:
· Someone who has gone through the design process and can help guide the process
· Someone that is more of a novice
· Someone in a non-design role

When participants are debriefing with their new groups ask them to listen and note any interesting design strategies that are intended to create more equitable and inclusive experiences for visitors.

We used the presentations as a way to kick off a broader conversation that helped unpack what we meant by agency, equity, and inclusion, but we also dove into a deeper look at what the opposite of that might look like. Examples of our group brainstorm and conversation can be found in the appendix.

The main goal of the first day was to collect design practices our participants use to create equitable and inclusive experiences for visitors in order to analyze those choices on subsequent days.

Creating a contextual baseline

DURATION: 30 minutes

OBJECTIVE: To introduce the diverse nature of the exhibits groups will be working with, and give background information about the specific exhibits participants will be reflecting on during the next module.

DESCRIPTION: The facilitator will share a presentation of a variety of exhibit types and introduce the participants to the exhibitions we will be taking a deeper dive on later in the workshop.
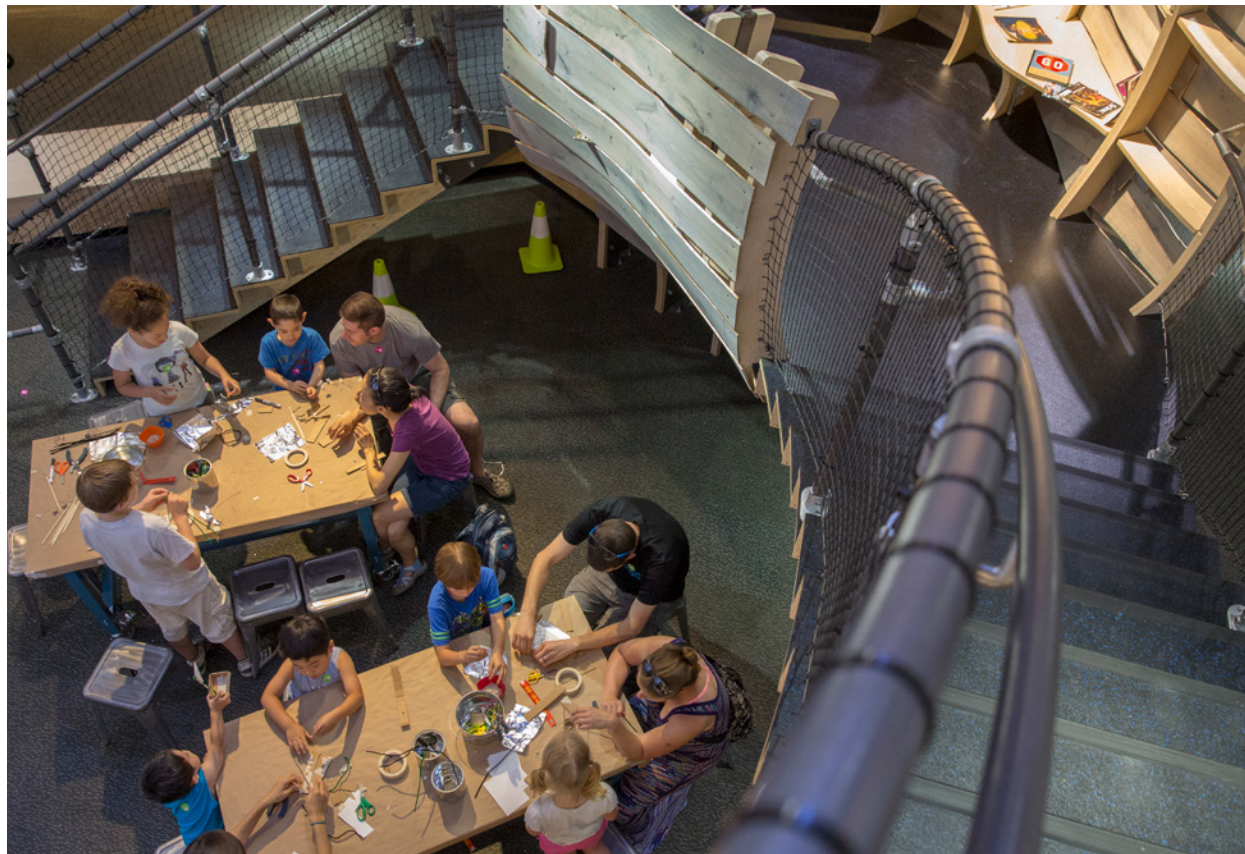
Participants have just had the chance to reflect on their own experiences, learn more about how others have experienced museums, and start conversations about designing to engage visitors in a variety of ways. Transition the group from their personal experiences to taking a deeper dive into the design of specific exhibits.

Facilitators should prepare a presentation that gives an overview of the exhibit areas that demonstrate the diverse nature of exhibits.

Some categories to consider would be:
· Phenomenon-based
· Content-based
· Historical
· Facilitated program/exhibit spaces

Presentations should include:
· History of exhibits
· How long they have been here
· Goals of the exhibition

The goal of this presentation is to create a shared baseline and context about the exhibits participants will be working with in upcoming activities.

NOTE: Use your internal resources (people with historical perspectives, documentation) to share evidence and specific information, not opinions about the exhibits.

NYSCI selected 5 of our exhibit offerings for participants to redesign with equity, inclusion, agency and authority in mind.

Reflecting on the kinds of exhibit experiences your organization has developed over time takes a level of vulnerability. Critical conversations and reflections should focus on the kinds of experiences the exhibit invites visitors into and should not be viewed as criticism of the team that developed these experiences.

Since we didn't have much time to observe, we chose the busiest time on the exhibit floor for participants to observe exhibits. This highlights quickly how exhibits are working and how they are falling short of serving visitors. The pressure of higher visitation forces visitors to make quick choices about what is for them, what is interesting to them, and what they are allowed to engage with.

Observe visitors at exhibitions

DURATION: 30 minutes

OBJECTIVE: Shift participants into active exploration on the museum floor observing how visitors engage with the exhibits and then reflecting on the morning's framing.

DESCRIPTION: Groups will choose an exhibit to explore and go out on the floor to observe visitors interacting with the exhibit.

Questions and thoughts to frame these observations:
· Identify any of the design strategies they discussed in earlier conversation and observe them in action.
  > Are they working as intended?
· Observe how design is shaping the invitation visitors receive when they approach the exhibit.
  > Do they seem to feel welcome?
  > Do they show evidence of being deeply engaged?
· Are the exhibits provoking visitors' curiosity?
· Is the exhibit working successfully for all visitors, or for some and not others?
· Are there visitors who don't engage with the exhibit at all?

Before groups head onto the floor the facilitator should:
· Ask the participants to reflect on their earlier conversations about their own experiences interacting and design exhibits.
· As they observe the exhibits, ask them to consider whether they see any of the design strategies we discussed in action. How are visitors engaging with the exhibit? Are the design strategies working the way they were intended?

Regroup and debrief in small groups

DURATION: 30 minutes

OBJECTIVE: Reflect on how visitors engaged with the exhibits and begin to articulate the design elements that shaped those experiences.

Begin generating ideas and examples of design features to focus on in redesign activities.

DESCRIPTION: Participants come back together to share their observations from the museum floor. Beginning in their small group, participants will debrief their observations.

These prompts can be used to get the conversations started:
· Where were visitors getting stuck?
· Where did they seem empowered?
· What questions did they ask?
· Where did they say wow?
· What aspects of the exhibit experience did you as a group want to emphasize or de-emphasize?
· How do you know they like it?
· How do you know when they are stuck?

Transitioning from small group conversations to a larger group share out, participants will note some of the design strategies they observed during their time at the exhibit, noting the ways that visitors were engaging with these design elements.

Acknowledge the parameters of the museum floor during the observation period. For example, we know that during this period we had a large number of school groups booked or during this time we tend to have a lot of families on the museum floor.

If the conversations start moving towards solutions, remind the participants that we want to stay focused on understanding the exhibits' issues and assets, and to save possible solutions until the next phase of this workshop.

You can prime the participants for the next module, which will use the exhibit design process to experiment with changes that could improve the capacity of these exhibits to promote inclusivity, agency and equity.

Because our observation period was so brief, we chose to do it on a high volume (1200+) day with a K – 2 audience.

This is a reminder that the purpose of this exercise is to collect the design strategies participants are using to engage people, not to get wrapped up in the redesign itself.

Module 2
Reflection in Action

Overview of the design process

DURATION: 15 minutes

OBJECTIVE: To give an overview of the abbreviated process we will be going through as we redesign an exhibit to focus on visitors' agency, inclusion, and equity.

DESCRIPTION: The facilitator will walk participants through the exhibit design process, inviting them to share their insights and experiences.

Present a graphic of the design process to ground the conversation.

Invite participants to share how and why they might have experienced this process in different ways.

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Redesign: Work Session Part 1

DURATION: 1 hour 15 minutes

OBJECTIVE: Explore the tension between content and visitor experience through the lens of equity, inclusion and agency.

Small groups will define a problem in relation to their chosen exhibit area.

DESCRIPTION: Participants will work to define a possible re-design of an exhibit piece that would increase direct participation, group interaction, and or expression of agency among visitors. The group will examine and describe what they perceive to be the learning goals and the intended interaction design of the piece, and will develop and document a possible approach to a redesign.

They will also reflect on how their approach draws on, or extends, the list of design strategies and challenges created during the previous session.

Mention to groups that we are trying not to jump to solutions, but getting into the mindset of defining and addressing a problem. One example of what this could look like is to map out the visitor experience and focus on points where you see opportunities to increase agency.

Though we just did a walk through of the exhibit design process, be open to groups that may choose to their own process and invite them to do so. "If you want to focus on your own process, spend this time talking to visitors or sketching or prototyping... do it."

Suggestions if groups get stuck or need a nudge to reframe:
· Set-up goals for what you are prototyping that relate back to agency, inclusion, and agency.
· What are the values you are looking for? What behaviors do you want to encourage? What does success look like?
· What assumptions are you making (or did you make) about how visitors engage with the exhibits you observed?

We tried to be careful to leave room for shifts in process, which could be equally important for equity, inclusion, agency and authority as exhibit design solutions.

We assumed that experts would be a useful resource for groups in their iterations but few groups took us up on it.

POST-IT: This is a tool we learned from the Google Ventures' Design Sprint format. It is a productive, quick and effective way to learn the needs of different users and stakeholders in a charette or quick design process. We use it frequently in our design processes at NYSCI. https://designsprintkit. withgoogle.com/method- ology/phase1-understand/ user-interviews

User interviews

DURATION: 45 minutes

OBJECTIVE: Create an opportunity for participants to learn about how others experience exhibits.
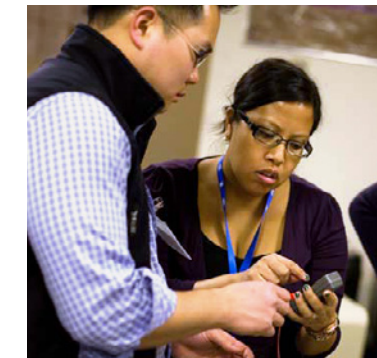
Value the voices and experiences of others and use that information as part of your exhibit redesign.

DESCRIPTION: Talk to other stakeholders including, but not limited to visitors, parents, visitor experience staff members, floor staff, and other members of the organization and surrounding community about how they experience each group's target exhibit.

Reflect on the assumptions you made during *Work Session 1*.

Prior to the start of the workshop, invite members of different stakeholder groups to come in and meet with the smaller groups. You can create a rotation across representatives from different stakeholder groups to optimize the experience.

At the start of the day you can also ask groups if there are specific people they might like to speak to. This will require some flexibility on the facilitators' part and the opportunity to draw in others. These last minute asks are easier to do with museum staff.

Almost all of our groups built pilot versions of their ideas and tested them on the museum floor. For the purposes of the goals of this workshop we think actually testing ideas in is unnec- essary and adds about a half a day to the workshop.

Work Session Part 2

DURATION: 1 hour 15 minutes

OBJECTIVE: Participants will respond to what they learned from the expert interviews, set goals, develop their redesign, and continue to extract design principles from their redesign process.

DESCRIPTION: Participants will continue to work on their redesign with focused goals for agency, equity, and inclusion in mind.

Continue to follow the framing from *Work Session 1*.

Share a time check with groups and set expectations of where you would like them to be by the end of this hour. Express that you hope they will be ready to share their ideas with other groups for feedback.

Prototyping with visitors

DURATION: 1 hour

OBJECTIVE: To allow participants to get feedback on their designs.

DESCRIPTION: Groups that developed a physical prototype will set up prototypes on the museum floor to test their ideas with visitors. They will observe and document how visitors interact with the prototypes.

Groups that put things on paper or in a model can meet with additional staff (i.e. floor staff, visitor experiences) for input to continue to work on developing their redesign.

Before sending participants onto the museum floor, ask groups what mechanism they have planned for observing visitors. This does not have to be elaborate, but intentional planning for observation should be incorporated into their plans.

During their time on the museum floor, remind participants to take pictures that can be used in their flash presentations later in the process.

Reflection

DURATION: 45 minutes

OBJECTIVE: Participants will evaluate their process and reflect on the feedback collected to document, share and discuss their redesign strategies with the larger group.

DESCRIPTION: Participants will use data collected from pilot testing to reflect on their redesigns.
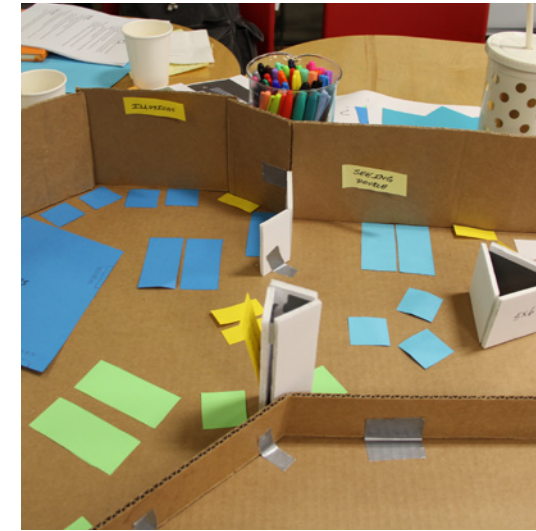
- What did you try?
- What didn't you try?
- What did you observe?
- How were your redesign strategies successful, and where did they fall short?
- What assumptions might you have made about visitors' mindsets and needs that might have contributed to changes that fell short?

Participants will create post-its summarizing assumptions, processes, design strategies, and observations.

When groups are documenting their observations, processes, design strategies and assumptions, you can offer different colored post-it notes to help organize their work and help them to identify patterns.

Flash presentations

DURATION: 1 hour

OBJECTIVE: Participants will learn about the process other groups went through in their redesigns, highlighting the redesign strategies they chose to use and why.

DESCRIPTION: Groups may use any format they wish to present an overview of their redesign and their findings from any pilot testing of it. They will relate their redesign back to the problem they were trying to solve, and consider how their redesign succeeded, or did not succeed, in increasing opportunities for inclusive, equitable engagement and expression of visitors' agency.

Groups will have 5 minutes to present and 10 minutes to take questions.

We had 6 groups present and found that they each needed more time. Towards the end we were rushing through. Depending on the size of your group you may want to allow for more time.

Reflecting on the day

DURATION: 30 minutes

OBJECTIVE: To recap the process that participants went through as they redesigned their exhibit and to synthesize reflections made across the different groups.

DESCRIPTION: Participants will reflect on the day's work and insights they may have gained from looking across the various strategies used by all of the small groups.

As groups are sharing out, ask others to listen for how the group presenting redesigned for more agency. They can continue to note the design practices that were employed and add to their notes and conversations later on.

Some expanded questions you can dive into are:
· How does your redesign organize the relationship between visitors, their own knowledge and beliefs, and canonical knowledge?
· Why did you organize it that way?
· What tradeoffs did you make when you were designing for inclusiveness?

The quick design process we've gone through over the past day requires that teams come to quick decisions which usually means the teams aren't analyzing their assumptions. Over the work in this module a team has developed a short-hand for types of experiences they value for visitors. Now a new group is coming to listen to their ideas and they need to explain themselves. Now is the time to begin to question WHY you made the design decisions you did. What were the intentions and why did you think a particular decision solved for the values at hand?

Summarize the day — focus on sharing out, sharing feedback, acknowledging assumptions and learning from our peers. Tomorrow we will have the opportunity to reflect and synthesize promising design principles more deeply.

Module 3
No, Really Question Your Assumptions

ACTIVITY

Partner reflections

DURATION: 30 minutes

OBJECTIVE: Create a more intimate moment of reflection for participants.

DESCRIPTION: Participants will break off into pairs to reflect on the redesign plans with a more introspective and personal focus.

· What's one redesign plan that you really resonated with, and one that you felt you wouldn't connect with? Why?
· What about your identity and experience might affect your feelings about those plans?

FACILITATION POINTS

Many of the workshop activities have focused on working in groups. Here, we are trying to shift participants into a more introspective frame of mind. You want to create a brave space for people, no matter how they experience the world. Be ready with a personal story or example that you can share with the group to demonstrate the kind of reflection, vulnerability, and empathy this next part of the workshop will require.

Debriefing the conversations is not necessary at this point. But you can ask participants to share something surprising.

Identity, assumptions, and experiences

DURATION: 1 hour

OBJECTIVE: Reflect on our experiences, both in this workshop and in our ongoing work creating experiences for others.

Begin connecting workshop experiences to various parts of our personal identities.

DESCRIPTION: Allow the participants to self-select groups of 4 – 5 for this activity.

Groups will address the following conversation prompt: "In an informal learning space, is there something about my experience that affects the lens that I use to see others?"

This is about unpacking the privileges and underlying perspectives we all have that we bring to the experiences we design.

Because the participants were museum professionals, many of them in the field for a long time, it was hard for some to separate their identity as a museum person or an exhibit person from their personal identity or family identity. Richer insights will come if you can coax participants to dig deeper than their professional identities in this conversation.

This conversation will likely not be comfortable, because it is about unpacking privileges and formative experiences to address the *why* behind our beliefs.

Do your best to help people sit with the discomfort or new insights, rather than staying in the realm of surface level reflections. We're trying to help participants delve deep and explore the assumptions they may make about other people that they may not have previously acknowledged in their design processes.

Continue to use post-it notes to note these assumptions. Use a new color if that's helpful to distinguish from the notes that were captured during the exhibit redesign process.

Add additional questions if conversations seem stuck.
· How have you personally experienced your own curiosity and how has your learning been supported in your life?
· In what ways do you assume that other learners are ready to be curious, to learn, or to explore?
· How have your assumptions about these issues shaped your work?

We found it useful to own personal experiences to both model the vulnerability we are asking of participants and demonstrate the differences in our own experiences.

Creating actionable ideas

> It felt like this prompt led to the depth of conversation we were building to over the three day workshop. In our iteration of this workshop we were constrained for time, but if you have longer to explore this conversation with your groups take it. It felt like after the ground-work of the design exercise in module 2, this module could have extended for hours.

DURATION: 1 hour 30 minutes (or longer)

OBJECTIVE: Create a design brief that you can take back with you to continue to inform your work.

DESCRIPTION: Have participants reflect on the post-it notes they captured throughout this process, and create the categories for interventions. How do you see them working together to create learning environments that work for people who are not traditionally invited into museums?

In pairs or small groups, participants choose one design principle that they want to explore in depth. Groups can tweak their principle to make it more realistic for different operational demands and content areas.

Here are some questions that can help provoke the conversation.

• Why does it matter whether signage is in multiple languages?
• Is designing for agency always in service of equity?
• Looking back at the last few days,
  > What did you try that you might want to expand on in the future?
  > What design strategies did you assume would be successful but have now reconsidered?
  > What design strategies do you think might be important to increasing inclusiveness, equity and expression of visitor agency through exhibits?

Participants may have different levels of experience in creating design briefs. Have some examples that can be referenced if needed.

Share design briefs

DURATION: 1 hour 15 minutes

OBJECTIVE: Identify actionable ideas to share with others outside the workshop.

Acknowledge that this workshop offered a place to start the conversation and this work is meant to be continued.

DESCRIPTION: Groups will share their working briefs, and discuss each as a whole group.

As participants share you can have them also think about where and with whom they can share these briefs in the future.

Wrap up

DURATION: 30 minutes

OBJECTIVE: To close out the workshop and have participants reflect on how they feel as they leave this experience.

DESCRIPTION: To close out the workshop, have participants choose an image of the sky that represents how they are feeling.

Once at their chosen images, have the groups share what brought them to the image. What does the image represent for them?

After this activity, share some logistical next steps — how you plan to share information, resources, notes, etc.

It's All Over

You did it! Take a moment to relax and debrief with your team. Build on the momentum you created over these three days to further explore how you can shift your practices, change your perspectives, and find new ways to approach your design work to create richer, more equitable learning experiences for your visitors.

Print 4 – 6 different images of the sky and hang them around the room. Some examples include:

• Clear, blue sky
• Dark clouds and lighting
• Colorful sunset
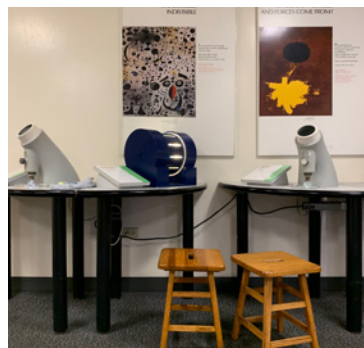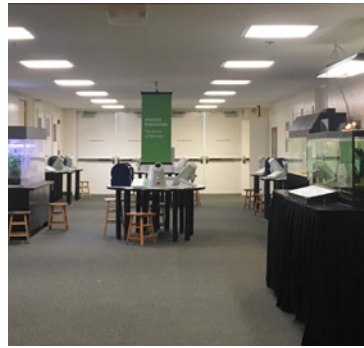• Blue sky with clouds
• Eerie, dark clouds

This is an opportunity to have participants reflect on how they are feeling and to recognize that their interpretations of the images might be different, but all their thoughts and feelings are valued.

A Case Study
Building on a Prototype Redesign

We know — all too often, the excitement and new ideas we encounter in settings like this workshop fade away as we fall back into normal routines. To inspire you and to demonstrate that it is possible to translate these big ideas into real changes, we're presenting this case study. It describes how one group's prototype redesign of a worn and fragmented exhibit area became the starting point for a complete redesign and re-launch of that area. Here is the story of how *Hidden Kingdoms* became *Small Discoveries*.

Hidden Kingdoms was a small biology exhibit that occupied a 700 square foot fire exit area on the lower level of NYSCI. Years ago, it was a much larger (5,000 square foot) exhibition, and only isolated elements of that original concept remained on the floor. The remaining exhibits were a hodgepodge, including a group of Wentzscopes, several live animals, and zoetropes depicting microbe motion. The space provided almost no interpretation. Framed prints of abstract art about microbes and atoms lined the walls but were difficult to interpret and not closely related to the exhibits. Many visitors enter the area at the end of a run down a darkened ramp, rushing into the well-lit area without any foreknowledge of what it might be about.

Despite its aging equipment and lack of cohesive design, visitors consistently rated this area highly in visitor surveys. Any observer would quickly notice that visitors frequently express strong reactions to what they see in the microscopes, ranging from excitement to disgust.

When one of the small groups in our conference was assigned this exhibit to re-design, they first focused in on the lack of interpretation in the area. They also observed visitor activity in the area, which was often high-energy because most visitors entered the space having just engaged in full-body experiences in other exhibits, and there were no cues in the space to re-orient or focus them on new ideas or information.

The group chose to focus their efforts on a few key changes in the space.

Slowing people down. They explored ways to use light to focus people's attention. This was important to their goals, because when most visitors are not focused and spaces are crowded, only the most motivated and assertive manage to gain access to the microscopes, a scarce resource in the space and the richest opportunity for exploration available.

Relevance: How could they invite connections between the materials in the exhibit and visitors' own experiences and prior knowledge? What microbes might you find at home? What might you find in your drinking water?

Discovery: The group connected the need to center visitors' agency to the opportunities for discovery that microscopes can offer. They created talk-back boards for visitors to draw the microbes they discovered, and labels on the wentzscopes that asked questions to help visitors notice things about the microbes.

The group also noted that the animals were not serving a clear purpose in the exhibition space, that they actually distracted visitors from learning about the function and purpose of the microscopes, and that the space was too loud to be a humane home for them.
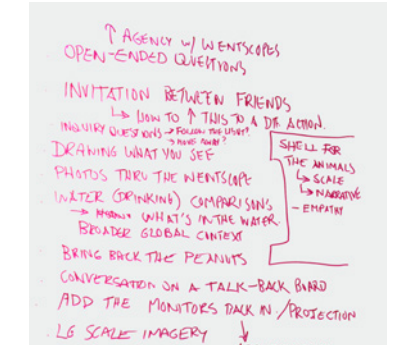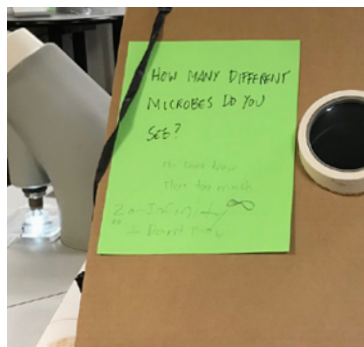
Six months later, NYSCI's exhibits team had the opportunity to act on the broad recommendations that group had made to inform an actual redesign of that exhibit space. Our approach to the redesign focused on helping visitors feel successful at discovering new things. Accordingly, we renamed the space *Small Discoveries*. Rather than positioning the microscopes as tools for presenting microscopic creatures essentially as illustrations of prescribed information, we wanted visitors to encounter them as tools that they could use to make discoveries of their own. We wanted visitors to have the experience of discovering something under the microscope, of seeing a microbe swim past and feeling excited that they had succeeded in finding and then potentially identifying what they had seen.

We created a sequence of steps that invited visitors to first consider how small something can be and still be observable using just our eyes. They then could try out tools for seeing things that are too small to see, starting with a magnifying glass, and stepping up to the Wenzscopes, which now house a variety of living microbes. Now visitors had opportunities to warm up to the idea of looking at things that are too small to see. We integrated information about the microbes into the space in multiple modes and formats, but organized it so that visitors would first discover a particular microbe, and then match their findings to materials around them to learn about what they had found.

We also wanted to prioritize making the microbes accessible, following up on the earlier team's focus on finding connections that would make the exhibit relevant to visitors. So we asked our visitors to share their ideas about locations where they thought microbes might be growing — a subway pole? a toilet seat? a dog's mouth? the underside of a shoe? Unsurprisingly, their suggestions were great, and we were curious about all of these places too. We built exhibit infrastructure that allows visitors to examine swabs from several different locations, that grow and change day to day. We are able to change out those swabs regularly, installing new swabs from new areas so that we, and our visitors, can continue to spark our curiosity about the microbes that live all around us.

We were still finishing the installation of the updated exhibit, *Small Discoveries* when the museum had to close for the pandemic in March 2020. The installation is now complete, but we remain closed (untl July, 2021) and have not yet seen large numbers of visitors using the new space. But the first few days of observation, when most of the new furniture was installed, were really encouraging. While visitor comments used to be along the lines of "ew, gross!" and "come look at the germs!," after opening the redesign we suddenly heard people say things like "look! the microbes are swimming!" and "I think I found a Euglena!"

Some design features we used to enhance agency, equity and inclusion and rethink the role of authority in the exhibition, *Small Discoveries*.

> The visitor's feeling of discovering something new in the microscope is prioritized over everything else.
Information is secondary. Because visitors experience themselves making their own discoveries, without interpretation blocking their path, they are then more open to seeking out and internalizing available information, because now they are invested in knowing about something that matters to them.

> Visitors have control over the tools of discovery.
We used multiple modes of visual magnification in the space, including macrocameras, Wenzscopes, and magnifying glasses. Visitors can use all of these interfaces to discover microscopic organisms, and as they try each one, they discover their shared functionalities, demystifying the more complex tools and building visitor confidence that these are tools that they can use safely and without fear of breaking them. In the development process, we noticed that microscopes for public use often require the visitor to turn a disc or move a plate to center a sample under the microscope lens. In contrast, we focused visitors on moving the magnification tool itself, searching across a stationary sample to find the microbes.

Visitors in *Small Discoveries*

> Interpretive content was available in the space but did not mediate visitor engagement with the magnification tools.
> For example, we did not emphasize telling visitors what kingdom each microscopic organism was from. Instead, a scale diagram on the wall demonstrated the relative size of microbes from different kingdoms, and visitors could choose to approach it and find the illustration that corresponded to the microbe they had discovered to learn more about it.

> The microbes themselves were presented as living creatures with life cycles and functions of their own.
> Signage, illustrations and the overall look and feel of the space framed the microbes as a type of creature, highlighting the diversity across species and their widely varying scales within the overarching category of "things too small to see." We did not "other" the microbes by playing up the idea that they were gross, icky or foreign. We were careful to write all the signage in ways that did not frame any microbe as good or bad, or define them only with reference to their impact on humans.

Appendix
Resources from Partner Institutions

Equity and inclusion are big ideas that touch every dimension of our professional lives. We can only improve when we all agree to keep learning from one another. In that spirit, here are pointers to rich resources that some of our peer institutions have created that can help you as you continue to explore issues related to equity and inclusion in science museums. Each one takes a unique perspective and focuses on different aspects of these issues, and each will leave you with new perspectives and new insights.

The Cultural Competency Learning Institute
community.astc.org/ccli/home

CCLI is a partnership among the Children's Discovery Museum of San Jose, the Association of Science and Technology Centers, the Association of Children's Museums, and the Garibay Group. The Institute focuses on creativity and innovation, communication and collaboration, and global awareness. CCLI introduces a framework for thinking about these skills within the context of cultural competence and diversity, and offers accompanying tools and resources.

The IDEAL Center
(Inclusion, Diversity, Equity, Access, Leadership)
smm.org/ideal-center

Housed at the Science Museum of Minnesota, the IDEAL Center helps professionals become agents of change in their institutions. They work with a wide range of educators and other professionals to address issues of equity and inclusion in educational settings.

Exhibit Design for Girls' Engagement (EDGE)
exploratorium.edu/education/research-evaluation/edge

The EDGE resources were produced as an outcome of a three-year research project at the Exploratorium that identified key design attributes for engaging girls with STEM exhibits.

Agency, Equity and Inculsion

Through group brainstorming and discussion we put together the following lists of words, phrases, images and questions to reflect the ways we defined agency, equity, and exclusion. While our conversation started on the idea of inclusion, the group wanted to unpack how exclusion could show up.

AGENCY

Your Effective State	System/Environment	Process of Taking Action
Efficacy	Being valued open ended	Decision
I can	Respect	Perspective
Independence	Authority	Effecting
Transgressive	Voice	Purpose
Intentionality	Our story/ My story	Action
Interest	Creating response	Doer
Ownership	Collective	Control
Individualism	Empowerment uncontrolled	Motivation
Motivated	Choice	
Rebellious	Power	
Responsibility		
Belongs to me		

Questions

Does voice of authority (museums) negate agency?

Is agency something for us to take or to give?

How You Feel → What You Do → How You Do It

EQUITY
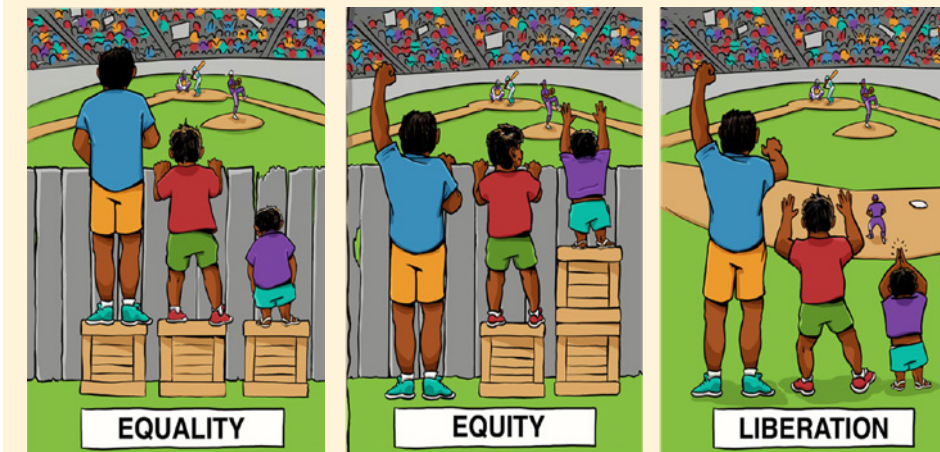
Interaction Institute for Social Change.
Artist: Angus Magurire based on the original work of Caige Froehle

EQUALITY   EQUITY   LIBERATION

Questions

Role of representation?

How can we create a liberatory experience?

Everyone gets what they need through fair access with a genuine and meaningful invitation and opportunity.

INCLUSION

Spaces, language, invitations that are exclusive:

Made to feel stupid for thinking and looking different

When something is impenetrable

Don't know what you are supposed to do

Didn't get a full invitation "you can come over, if you want to."

Does exclusion have to be negative?

Exclusion feels like pushing out.

If you are inside exclusion is good.

You can choose to exclude negative things.

Exclusion that is about adding value because you get to exclude someone else.