EcoTarium Exhibit Design Philosophy for
First Steps in Science [Working Title] Early Learning Exhibit Space

**Purpose:** Create an interpretive space that reflects the content and character of the larger Museum and serves as an entry experience for visitors 2-6 and their caregivers. This space will provide our youngest visitors with foundational building blocks that aid in physical and cognitive development as well as the formulation of precursor science process skills. Through modeling and imbedded supports the exhibit will also assist caregivers in providing cognitive scaffolding for children 2-6 years of age in an encouraging and judgment-free environment.

**Interpretive Goals:**
1. Focus on the natural sciences as the lens for early physical and cognitive development.
2. Integrate precursor science process skill development to prepare early learners for NGSS Crosscutting Concepts readiness.
3. Use subject integration to support early language skills in all components.  
4. Embed stepped zones of proximal development in each component to provide varied experiences for the diverse range of cognitive stages in this audience.
5. Provide stealth scaffolding for caregivers to help them engage in their children’s learning experience in a natural and non-judgmental way, i.e. “prompts without preaching”.
6. Design components in a way that supports staff-assisted programs within the exhibit space without requiring it.

**Interpretive Themes:**
- Whenever possible mechanisms within the space should make cause and effect visible and understandable. Screens and other electronic devices which hide direct cause and effect should be avoided.
- Prompts for descriptive conversation (adjectives, adverbs, onomatopoeia) should occur throughout the space.

**Design Goals:**
1. Create unique but relatable experiences.
2. Facilitate open-ended opportunities for prolonged exploration.
3. Develop a space which supports the inclusion of staffing but does not require it.
4. Integrate amenities that support caregivers and provide a safe environment for our youngest visitors, including those with variety of sensory and physical needs.
5. The space should reflect the EcoTarium’s exhibit brand through use of materials and content that speaks to our other offerings. It should incorporate our signature mix of exhibits (live animals, natural history collection, interactive exhibitry, and our outdoor assets).

**Design Themes:**
- Materials need to be “like home, but better” so that the experience is unique to the Museum, but can be translated by families to analogous experiences at home using objects commonly found in the home or yard. (Related Design Goal:1)
- Loose exhibit parts and consumables should be interchangeable, or at least compatible, so that they can be incorporated at multiple exhibits in the space. (Design Goal: 2)
- Imaginative play and role playing will be supported through the affordances of loose parts, rather than through prescriptive props and costumes. Whenever possible props will be selected for their ability to support a multitude of meaning-making experiences for the user. (2)
- At least one “messy material” such as sand, mist, modeling compounds, grains, etc. needs to be designed into the space, because of the rich support they provide for early cognitive development. (2)
- The space layout should be such that it minimizes the potential for “intrusion” into the space by older children, with special attention to blocking sightlines to any potential “attractive nuisances”, such as messy materials. (3)
• Design and planning must allow for the more complex front and back of house logistics and for the additional operating expenses required by the space.  

i Studies cited by the Thirty Million Words Initiative document a large inequality in children’s early language environments, with children from families of lower socioeconomic status hearing approximately thirty million words less than their peers. This language gap is correlated with the academic achievement gap – in all academic areas, including STEM.

ii In the developing the ACII, Lorrie Beaumont recommends designing exhibit experiences that, among other things, include ‘opportunities that are challenging for the child and require the adult to scaffold and support the child, moving them through their “zone of proximal development.”’ in order to support a variety of caregiver roles.

iii In 2007, OMSI tested several methods for prompting parents to engage in their children’s learning and to reflect upon their role in that learning. Signage specifically targeted to the adults about children’s learning were largely ignored, however short, instruction oriented prompts and adult-sized props were used by the caregivers and elicited a variety of parental roles engaging with children’s I exploration and learning. Among many others, Providence Children’s Museum’s Mind Lab is exploring a variety of parental support tools and designs.

iv In other words, no experience should be delivered via a “black box” mechanism if the underlying mechanisms can be revealed to the user. This is to support the NGSS cross-cutting concept of understanding cause and effect.

v A part of the language gap is the nature of the words children hear, with low SES children hearing more directive, rather than descriptive, words.

vi Two fields of practice indicate benefits from taking this approach. Research by NYU and Manhattan Children’s Museum regarding “psychological essentialism” found that when science is presented as a role (“be a scientist”), girls were much more likely to leave a science activity when encountering a set-back. When science was framed as an activity (“let’s do science”), girls persisted in the activity. Vygotskian theory promotes open-ended nature of toys (in exhibit terms loose parts) , to support symbolic thinking (e.g. a stick or rod) rather than role-playing props (a decorated “wand”).

vii These include the cleaning demands of “messy materials”, a high replacement rate of loose parts, and back-of-the-house cleaning appliances for frequent sanitation, etc.

Bibliography:


• Boston Children’s Museum. “The Adult Child Interaction Inventory (ACII).”


