# Formative Experiences in Museums: Characteristic Checklist

This checklist is intended for internal use by museums to aid in their experience development process so that they can inspire current and future generations to pursue STEM through their offerings. A "formative STEM experience" within this context is defined as an influential childhood event, experience, or realization that fosters positive thoughts about STEM careers or studies (Bradford, 2020). There are nine identified characteristics that help foster formative experiences, followed by the "experience goal" which describes what each characteristic includes, and the "visitor feeling" which details how the visitor should feel during and after the experience to meet each characteristic.

The checklist was designed to be used in the follow scenarios:

**Experience Design:** Aid in brainstorming and audience outcomes determination.
While all of the characteristics are important, not all characteristics need to be included for an offering to nurture formative experiences. With that in mind, the checklist could be used to help the design team determine which characteristics they would like to include.

**Reevaluation:** The checklist can then be used again retrospectively to reevaluate chosen characteristics and their implementation. Think of this as a "check-in" to see if the characteristics chosen are still the characteristics that the experience supports.

**Analysis:** The checklist could be used on a wider scale to gain a general indication of which characteristics are most and least frequently seen within the museum's experiences.

This checklist was developed by a WPI student team for a university research project in collaboration with Museums Victoria and was formed through the literature review, focus groups, and staff interviews they conducted. If you would like to read the student's full report, *Formative Experiences in Museums: Influencing STEM Aspirations in Australian Youth,* it can be found by searching the title in Worcester Polytechnic Institute's *Digital WPI* website (https://digital.wpi.edu/).

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Bradford, B. C. (2020). Examining STEM Formative Experiences and College STEM Outcomes from a Social Cognitive Career Theory Perspective [Rice University]. https://www.proquest.com/docview/2568282140/fulltextPDF/911F26D1EF264A0FPQ/1?parentSessionId=HvBgWOrwhxrupHoutYd%2FT7PomgjH82j%2FvFRi5NCnXIY%3D

| Characteristic | Experience Goal | Visitor Feeling | Present? | Notes |
|---|---|---|---|---|
| Amazement | The offering intends to awe and inspire visitors with cool, interesting, or mind-blowing material. | Visitors should feel amazed, impressed, or shocked. Visitors should remember the experience as “cool,” “interesting,” or “fascinating.” | | |
| Real-Life Connection | The offering is designed to show how STEM concepts apply to real life. It should also demonstrate the applications and careers involved in STEM work | Visitors should leave the offering believing that STEM concepts apply to their own life and that there are many possibilities for their future | | |
| Exploration and Inquiry | The offering provokes curiosity and allows exploration of STEM topics in a fun and safe way. Open-ended experiences or questions should be provided, but balanced with defined answers and structure. | Visitors should feel supported in their exploration, and leave curious and inclined to “keep sciencing” | | |
| Hands-On | The offering involves activities where children can touch, play, tinker, manipulate, and build with their hands. | Visitors should feel engaged, active, and involved in the STEM process or activity. | | |
| Positive Reinforcement | The offering helps build confidence and positive feelings in STEM through positive reinforcement and staff support | Visitors should feel confident, supported, and proud of their ability | | |
| Enjoyment | The experience is designed to be fun and enjoyable. | the visitor should leave with a general sense of enjoyment and feeling joyful. | | |
| Social Interaction | The offering is designed to allow multiple participants at once. This can be physically or mentally, with bystanders offering advice and encouragement. The focus should be on involving close friends and family in learning. | Visitors should feel involved and connected with others. | | |
| Sensory | The offering is designed to immerse visitors in a STEM environment through sensory experiences (visual, auditory, tactile). | The visitor should feel immersed or surrounded in experience. | | |
| STEM Identity | The offering helps break down STEM stereotypes and makes science more accessible. | The visitor should feel that they are included in the STEM community. STEM work should feel approachable | | |