

Creating Open-ended Exhibits that Work



Using *Invention at Play* as a Case Study

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Invention at Play is a traveling exhibition developed by the Lemelson Center for the Study of Invention and Innovation in partnership with the Science Museum of Minnesota

Project Goal

To develop a hands-on exhibition that encourages visitors to:

- explore the relationship among play, creativity, and invention in the past, present, and future;
- learn about the inventive side of children's play and the playful aspects of inventors' work; and
- experiment with their own playful and inventive abilities.

Key Messages

Main message:

- We are all playful and inventive.

Section messages:

- Playing builds creativity skills.
- New tools and technologies change how people play. Does this change how they invent?
- Inventing is a creative activity that involves play.

Analogous Types of Play

Children's inventive play

- Exploring with all the senses
- Imagining, pretending
- Social play, communicating
- Playing with puzzles and patterns

Inventors' playful approaches

- Tinkering, experimenting
- Visualizing, modeling, drawing analogies
- Brainstorming, role playing, teamwork
- Problem solving, thinking in and outside of the box

We wanted *Invention at Play* exhibits to:

- Be open-ended to encourage problem-solving
- Spark curiosity and exploration
- Stimulate the imagination
- Support multi-generational activity
- Enhance visitors' understanding of main messages—the play/invention connection

To achieve our goals, we had to:

- Develop clearly articulated goals for each of the three exhibition sections
- Develop key messages
- Assess components repeatedly to evaluate their adherence to goals and messages

Section 1: Inventor Stories



Newman Darby's Sailboard Simulator



Stephanie Kwolek,
Kevlar inventor



Alexander Graham Bell
Borrow from Nature panel

Section 2: Invention Playhouse



Section 3: Issues in Play—Past, Present, Future



Prototyping played a vital role

- Early prototyping of hands-on components
- Prototyping of hands-on components *with* label text
- Prototyping of main hands-on components in context

Early Prototyping, January 2001

We repeatedly tested, observed, and redesigned components at SMM until visitors used them “intuitively.”



Top: first prototype of Magnetic Racetrack
Bottom: first prototype of Rocky Blocks



Prototyping Hands-on Components and Graphics, April 2001

Visitors, including those with visual and mobility impairments, were observed and interviewed.

Activities and label copy were modified over four days at the Smithsonian.

Top: second prototype of Magnetic Racetrack
Bottom: second prototype of Rocky Blocks



Prototyping in Context, January 2002



In-context prototyping
of main activities

Final Magnetic Racetrack



Summative Evaluation

Assessed visitor responses to hands-on activities and their perceptions of invention and inventors after seeing exhibition. Go to www.randikorn.com for complete study.



Responses to Hands-on Activities

- Spent a median time of 4 minutes at each activity studied.
- Actively engaged with the activities, testing new combinations, analyzing properties, discussing and executing plans, continually experimenting with multiple iterations.
- 62% of family groups used activities together.
- Nearly all immediately understood how to use activities and spent majority of time tinkering with them purposefully.

Visitor Perceptions of Invention

- Expressed more comprehensive and nuanced ideas about inventors compared with visitors in front-end study.
- Diversity of inventors in exhibition helped broaden visitors' definitions of "inventor."
- Expressed an expanded understanding of the invention process, remarking on inventors' different approaches, sources of inspiration, and their willingness to take risks and fail.
- About 50% made direct play-invention connections; 25% said exhibition was about invention; 25% gave less specific answers – history, science, or a fun, hands-on experience.

Conclusions

- Clearly articulated experience and communication objectives provide a gauge for determining the effectiveness of exhibits and visitor experiences.
- Continual testing of open-ended exhibits during development improves the exhibits' effectiveness in communicating main messages.
- Including graphics, images, and objects that reinforce key messages enhances the effectiveness of activities and communicates exhibition messages.

Gretchen Jennings, Randi Korn, and Johanna Jones May, 2004

Invention at Play Awards

- Won AAM award of excellence at convention in Portland, Oregon in 2003.
- Was used as case study on integrating accessibility into exhibition planning and design. 2002 Kennedy Center international ADA Conference.
- Won MUSE gold medal for Web site www.inventionatplay.org AAM 2003.

Invention at Play is traveling in two versions—the original and a smaller one. For information about availability and booking, visit www.astc.org, Association of Science-Technology Centers Web site.

Credits



Smithsonian Institution

National Museum of American History
Lemelson Center for the Study of Invention and Innovation

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