

Liberty Science Center:  
The Science of the Statue of Liberty  
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In the shadow of Liberty Science Center, on a small island in New York Harbor, the Statue of Liberty stands welcoming all to the United States and the New York metropolitan area. A gift from France over 100 years ago, she is so much more than a beautiful work of art. She represents American values and the American dream. She is also a feat of engineering and can demonstrate many different science concepts. This proposed exhibition at Liberty Science Center will showcase several of the scientific phenomena at work at the Statue of Liberty.

### **The Rationale**

The Statue of Liberty is visible from miles away, and Liberty Island is accessible from both New York and New Jersey. However, the cost of a trip to Liberty Island and Ellis Island currently starts at \$18.50 for adults and \$9.00 for children. There is an additional ticket required to access the Pedestal, where the Statue of Liberty Museum is located, and an additional fee to climb to the Crown. These premium tickets are extremely limited, and must be reserved months in advance during peak periods (Statue Cruises, 2017).

Even if a visitor is fortunate enough to climb to the Crown and view the structure in person, it is unlikely that they would realize the engineering that went into building such a huge structure in the middle of the harbor, and subjecting it to various forces of weather and nature. This exhibition will enable any visitor to Liberty Science Center to experience the Statue of Liberty in a unique way.

### **The Physical Structure**

Schwan, Grajal and Lewalter (2014) note that most science museums contain many exhibits that compete for the visitor's attention. They suggest that an unusual or striking

appearance may draw visitor attention and make the exhibit more successful (Schwan, Grajal & Lewalter, 2014).

In this case, the centerpiece of the exhibition is a large-scale model of the Statue of Liberty, mounted on a simple cylindrical base. This model is unusual because one-half of it is sheathed in the Statue's familiar green copper skin, while the other half is cut away, exposing the interior structure of the Statue. This area would be lighted in such a way to make the complex armature visible from several feet away from the scale model. Figure 1 depicts this concept.

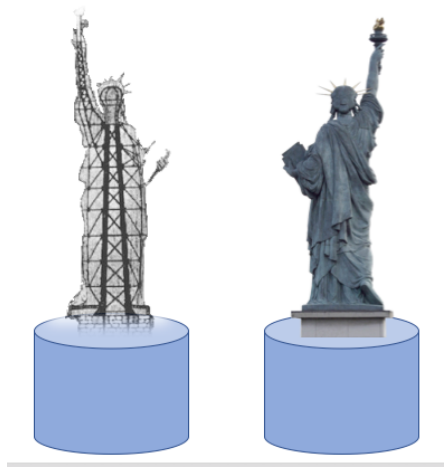


Figure 1. Front and Back of the scale model of the Statue of Liberty.

Images of the Statue of Liberty in the public domain.

Surrounding the base cylinder, a railing will contain several video screens, allowing visitors to interact with the display and learn various concepts. Figure 2 shows this concept.

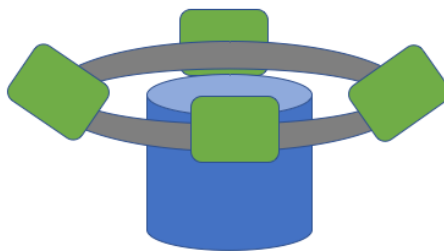


Figure 2. Video displays mounted on a railing surrounding the cylindrical base.

Visitor safety is always a primary concern, and a large structure such as the scale model is very appealing as a climbing structure. To discourage this behavior, the space between the railing and the floor will be surrounded by Plexiglas panels. In peak periods, it may be advisable to station a member of the museum team in the area, as is seen in many other popular exhibits. That team member could also assist in interpreting the exhibition for visitors and answering questions.

The space between the railing and the base cylinder will contain display cases so artifacts or models explaining the concepts can be housed. The museum at the Statue of Liberty has a loan program with other museums, and may be able to assist with authentic artifacts (National Park Service, 2017a).

### **Concepts**

There are many scientific principles at work at the Statue of Liberty, and several of them will be highlighted in this exhibition:

- Why is the Statue green? The science of oxidation and the formation of the familiar green patina will be described in a video display. A display case will show pieces of copper in its bright, shiny form, in a partially oxidized state, and in a fully oxidized state.
- How does the Statue respond to high winds? A video will be prepared that explains that the Statue sways three inches in a 50-mph wind, and the torch sways six inches in that wind (National Park Service, 2017b).
- Has the Statue ever been struck by lightning? The video display will include an animation that is controlled by the visitor, where pushing a button causes a lightning strike. A recent lightning strike on the Statue was captured by

photographer Jay Fine, and permission will be sought to include his work as a part of the display.

- Is there any interaction between the different metals used in the Statue? A video will be prepared to explain the method used by the original artisans and the restoration team to stop the flow of electric currents between the metal in the structure and the copper skin (Copper Development Association Inc., n.d.).
- Does the Statue expand and contract when temperatures change? A video will explain how the structural design of the Statue allows the skin to “float” and freely expand and contract in the weather (Copper Development Association Inc., n.d.).

One key feature of any installation is accessibility. All interpretive labels will be in a typeface and design that is suitable for visitors with limited vision, and will also be presented in Braille. The multimedia programs on the display screens will be open-captioned for hearing impaired visitors. The display screens will be mounted at a height that will be usable by visitors who are standing or seated in a wheelchair. Sufficient clear space will be maintained around the exhibition to allow safe movement of a wheelchair to each interactive station (Smithsonian Accessibility, n.d.).

### **A typical visit**

When a visitor approaches the museum gallery, they will see the large Statue of Liberty model. They will be intrigued by the sheer size of the model, and the fact that only half of the model is covered with the Statue’s familiar green skin. At that point, they will select a display screen, and interact with it. After the interaction, the visitor will move around the base to the next

available station. In all, they will experience five different stations describing five different phenomena associated with the Statue of Liberty.

A family with younger children can also enjoy the exhibition. The display screens will be accessible to all but the smallest children. It is hoped that parents will read the interpretive labels to their young children, and encourage them to interact with the displays.

### **Conclusion**

When I was a Park Ranger at the Statue of Liberty, every day I answered the question “Why is the Statue green?” countless times. This exhibition will answer that question and many more. It will give visitors who might not get a chance to actually visit the Statue and see her interior structure firsthand a view inside, and an understanding of many scientific concepts.

## References

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