

The Museum Environment and Preservation

Objectives: Through discussion and brainstorming, students will learn about the destructive impact of environmental factors on man-made artifacts and structures. Upon completion of one or more activities, students will gain a concrete understanding of the complexity of the science of preservation.

Time: 50 minutes per day for two weeks, depending on the number of activities

Skills: Hypotheses development, preservation techniques

Content area: Science- Chemistry, Science- Earth science, Social Studies- United States history

Materials:

- ◆ New cotton t-shirt
- ◆ Old cotton t-shirt
- ◆ New synthetic cloth
- ◆ Old synthetic cloth
- ◆ Items chosen for preservation by individual students, such as letters, photos, etc.

Standards:

NCHS History Standards

5-12 U. S. History Content Standards

Era 4: Expansion and Reform (1801—61)

1A: The student understands the international background and consequences of the Louisiana Purchase, the War of 1812, and the Monroe Doctrine.

AAAS Science Standards

6-8 Scientific World View

1A/M2: Scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.

6-8 Scientific Inquiry

1A/M1a: Scientists differ greatly in what phenomena they study and how they go about their work.

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6-8 Scientific Enterprise

1C/M4: Scientists are employed by colleges and universities, business and industry, hospitals, and many government agencies. Their places of work include offices, classrooms, laboratories, farms, factories, and natural field settings ranging from to the ocean floor.

Introduction

The Star-Spangled Banner hung in the flag hall, in the National Museum of American History, from 1963 to 1998. The museum is located on the National Mall, a grassy, park-like expanse that is also home to other museums and national monuments. Every year, millions of people visit the National Museum of American History. Even though the Museum has careful light and climate controls, the visitors have had an impact on the flag. In 1999, the flag was moved into a special laboratory to undergo conservation treatment. There, it was removed from its linen backing, cleaned with a special solvent and photographed. In 2008, the flag was moved to its new home – an environmentally controlled chamber that is air-, light- and water-tight. There, under dim lighting, it is displayed on an aluminum table at a 10° angle so that it can be safely viewed by the public.

Directions

Have your class hypothesize about how the millions of annual visitors to the National Museum of American History have impacted the original Star-Spangled Banner. Remember that no visitor may touch the flag. What do people bring with them when they visit a museum that may affect a textile that was made in 1813?

1. As individuals or as teams, have your students create a list of possible factors that have damaged the flag, over the long term, due to the high visitation rates at the museum.
2. At the National Museum of American History, conservators and scientists have found a surprising variety of foreign substances on the flag. For example, they have found tiny pieces of grass, pollen, threads, paper and dirt. They have also found evidence of molds, even though the climate in the museum is carefully controlled. Have your students hypothesize as to the origins of these substances. What do they know about the location of the museum that can help them explain the plant material? What do they know from their personal experiences about crowds and humidity?

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3. It is important that the American public be allowed to see the Star-Spangled Banner, but it is equally important that the flag be preserved for future generations. Lead a classroom discussion about preservation. For example, you might ask your students the following questions:
 - ◆ If you had an historic artifact or textile, how would you preserve it? Would people still be allowed to see it?
 - ◆ What processes would you follow to make sure the item wasn't damaged over time?
 - ◆ What do conservators mean when they talk about storing something in an "acid-free" environment?
 - ◆ Why is it important that an artifact be carefully cleaned before it is stored?
 - ◆ Can every textile be washed in a washing machine?
 - ◆ What types of damaging factors exist in our natural environment? What about our man-made environments?

Student Activities

The following may be used as an assignment, in which a student completes one or more of the activities at home or during class time.

- ◆ Examine a new cotton t-shirt under a microscope. What do you see? Now look at an old, well worn cotton t-shirt and compare their findings. Describe the differences in the old and new cotton fibers. Try doing the same comparison with synthetics, and see what you find. How does this research help us understand the importance of carefully preserving the Star-Spangled Banner, which was created in 1813?
- ◆ Investigate the impact of light upon different types of matter. Why does the National Museum of American History limit the amount of light to which the Star-Spangled Banner is exposed? Through research and experiments, find out what type of light can be the most destructive. For example, students may investigate light wavelength, intensity, and length of exposure. These factors may be considered individually or in combination with each other.

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- ◆ Other places open to the public, including historic buildings and battlefields, also have to balance the impact of large visitation rates with the need to preserve their sites and artifacts. What about historic sites, National Parks, landmarks, or museums in your area? Create a chart showing the different issues facing these places, and make their own recommendations for preservation.
- ◆ Select an object, document, textile, or photograph to preserve. Research techniques for preserving this item according to museum or archive standards. (Use the links below to help you in your research.) Following the guidelines, preserve the item of your own choosing for the future.
 - <http://www.americanhistory.si.edu/starspangledbanner>
 - <http://icom.museum/>
 - <http://www.nedcc.org/home.php>

Acknowledgements

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