

Lesson Plan

National Park Service
U.S. Department of the Interior

Education Department
Ellis Island Immigration Museum
Statue of Liberty National Monument



Preserving a Symbol Grades 5-8 Post Statue of Liberty Lesson Plan

Overview:

For over 125 years, the Statue of Liberty has served as an iconic symbol for the entire world. And the Statue's physical appearance (especially her green-likeness) has been copied and imitated for generations. Yet, there have been few discussions concerning how the Statue of Liberty got its famous coloring. This activity explores how the Statue of Liberty changed from its copper-tone to its illustrious green luster.

Time Frame:

Two 15-minute sessions (two different classes or at the beginning and end of the day)

Materials:

- Small Container
- Vinegar
- Salt
- Paper Towel
- Spoon
- Pennies
- Statuette (Optional)

Objectives:

At the end of the lesson, students will be able to:

- Identify the different natural elements that have helped the Statue of Liberty change color over time.
- Describe how the oxidation process can impact metals like copper.
- Interpret whether the Statue of Liberty will hold as much cultural significance today had the copper not oxidized

Procedure:

1. Introduce to the group how the Statue of Liberty has been represented in many forms, as a symbol of freedom to the world today. Inform students that the Statue of Liberty (made of copper) was once a bronze color when it was first built. Explain that the class will see the first-hand effects of oxidation on copper; a similar process that had impacted the Statue of Liberty over a century earlier.
2. Take two small cups and pour a vinegar/lemon juice solution into one, and water into another in front of the students. Ask them to turn and talk with a partner about what they think will happen once the pennies are dropped into the solutions. Invite them to share their predictions with the class. How do they know their prediction is right? Prompt them to include details in their justification.
3. Distribute two pennies and ask each student to place the pennies in the vinegar-based solution. Let the pennies sink to the bottom.
4. Once one of the pennies has turned green, ask students what they think happened. Invite their responses.

Explain that the change in coloration to the penny that was dipped in the vinegar/lemon juice solution is known as the chemical process of oxidation. (Note: Oxidation initiates a process that forms a patina (or stronger copper), where oxygen come in contact with metal (where in this case) creating a stronger copper.)

5. Ask the students if there is a word in oxidation that they might already know. Oxygen is a gas that is found in the air. Pennies are made from copper, and copper, when exposed to oxygen, experiences a chemical reaction known as oxidation.

As the class waits, explain that the Statue of Liberty underwent a similar process when she was brought to the United States. Because the Statue of Liberty had been exposed to the salt water and the musty air in the New York Harbor, the Statue had changed color gradually (from a deep bronze to a turquoise green) over time.

6. Ask students if they can think of any monuments around the city or in their neighborhood that might have undergone the process of oxidation. The Statue of Liberty is made entirely of copper and is now green-colored due to the effects of oxidation.
7. Inform students that because color photography had not been made available, we have a hard time determining how long exactly the Statue took to change to its now iconic green. We can examine the black and white photos of the time period, however, to verify that the Statue was originally brown or dark grey. Invite students to take a look the different sets of photographs, and as a group, have them piece together what they believed to be the chronology in which the Statue had changed colors. Explain that the National Park Service believes that the oxidation process took about 25 to 30 years to fully change from bronze to green.