

📖 Grade Level: 7

📖 Subject Areas:  
Social Studies, Science

📖 Duration:  
Pre-visit: 2 hours  
Visit: 1 day, on-going

📖 Setting:  
Classroom and Mission

📖 Skills:  
Social Studies: 7.21E Support a point of view on a social studies issue  
Science: 7.14B Analyze effects of weathering  
7.14C Make inferences and draw conclusions about effects of human activity

📖 Charting the Course:  
In this lesson, the scientific concept of weathering is applied to the preservation of historic sites. There is an overall connection between human presence and our environmental impact that extends to our ethical responsibility and the consequences of our action/inaction.

📖 Essential Terms:  
erosion, weathering, vandalism, ethics, environmental impact

## ENVIRONMENTAL INTERACTIONS

**Big Idea**  
**What can we do to minimize our impact on San Antonio Missions National Historical Park and its water system?**

### Objectives

Students will:

- ◆ Explain the physical effects of weathering and erosion on historic sites
- ◆ Dramatize the need for park ethics
- ◆ Assess our possible impacts on the Missions and their water systems

### Making Connections

Natural forces such as weathering are slowly destroying historic sites. Unfortunately, even more destruction is caused through human carelessness and senseless acts of vandalism.

Missions Concepción, San José, San Juan, and Espada make up the San Antonio Missions National Historical Park. The citizens of the United

States have charge the National Park Service to protect and preserve these sites for future generations. While there are measures that Park Rangers can take to protect historic sites (e.g. covering ruins with two feet of dirt protects the site's integrity), visitors must monitor their own behavior if these historic resources are to remain viable. Graffiti and litter are common problems, especially near Espada Aqueduct. It is interesting to note that most of the visibly religious buildings are seldom vandalized.

This lesson is designed to allow students to draw their own conclusions about the impact of human presence on historic sites. It is hoped that they will gain an appreciation for national parks and their own role in the continued preservation of sites, and will monitor their own behavior accordingly on their visit to San Antonio Missions National Historical Park.

## Materials

Engagement (pre-visit):

- ◆ enlargement or overhead transparency of the picture of the Rose Window at San José Mission

Exploration (pre-visit):

- ◆ hair dryer
- ◆ watering can
- ◆ sand/dirt
- ◆ rectangular baking pan
- ◆ several small- to medium-sized rocks

Elaboration (pre-visit):

- ◆ "Park Ethics" sheet – each behavior cut as a separate strip

## Engagement (Pre-visit):

Show the students the picture of the Rose Window at San José Mission, and tell them "This window is part of the original church at Mission San José. The bottom of the window currently sits about two feet below groundlevel, although it has been dug out. Why do you think a window would be located below ground level?" List their answers.

## Exploration (Pre-visit):

The following activity is from Zike, Dinah (1993). *The Earth Science Book*. New York, NY: John Wiley & Sons, Inc.

1. Place enough sand or dirt in the pan to cover the bottom evenly, 1 inch deep. This forms the "land."

2. To create "wind" turn the hair dryer to its lowest setting. With the hair dryer 2 feet from the pan, point the "wind" towards the "land". What happens?

3. Slowly move the "wind" closer to the "land", Is the soil moving? Turn the hair dryer to a higher speed and see what happens.

4. Place rocks on the "land." What happens to the soil around and under the rocks as the "wind" blows? Remove rocks.

5. Sprinkling water from watering can, what happens as water hits the surface of the "land"?

6. Place a book under one end of the pan, forming an incline. Sprinkle more water on the "land". Does the angle of the "land" make any difference? Raise the "land" higher.

7. Place the pan flat again. Blow a strong "wind" over the wet "land". Is there any noticeable difference?

## Explanation (Pre-visit):

Rocks are constantly broken down into smaller pieces by a process called weathering. When pieces of rock are moved or carried away by wind, water, or ice, it is called erosion. Historic sites are targets of weathering and erosion. Vandals also may alter or destroy a site.

In order to protect historic sites it is commonplace to bury them under mounds of dirt. This greatly reduces the effects of weathering. It also conceals sites from vandals and looters. The "Rose Window" at San José Mission seems to be below ground level because the ground has been raised two feet with new dirt. However, please note that the ground around the Rose Window was not raised to preserve the site, but rather as a result of irrigation systems laid out in the compound.

## **Elaboration (Pre-visit):**

1. Present the following statement on the board:  
*Take nothing but photographs, leave nothing but footprints.*  
Elicit student response as to why this is applicable to a historic site.
2. Cut out strips from Park Ethics sheet. Give one strip to each group of three. The group will prepare and present a quick skit/dialogue that explains the rule and persuades others of its importance in preserving our historic sites.
3. Discuss how families preserve cherished items (e.g. only use "best" china for special occasions). We can use and enjoy things, but we have to be responsible and take care of them.

## **Evaluation (Visit/Post-visit):**

1. Encourage students to remember their potential impact on the Missions and their water systems during their visit. They should be expected to monitor their own behavior.
2. During and after the site visit, discuss evidence of environmental impact both negative and positive. This may include litter from previous visitors, vandalism, restoration projects, etc.
3. Working in small groups, "rewrite" the park ethics in such a way that kids their age could relate to and respect the national historical park.



**The Rose Window**

## **Park Ethics**

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**DO NOT LEAN AGAINST THE WALLS OF MISSION STRUCTURES. Note: some have historic frescoes on them and most have the original plaster on them.**

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**DO NOT SIT OR WALK ON FOUNDATION WALLS. Note: The walls are built of rock and some are only 2-3 feet high.**

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**BE CONSIDERATE OF OTHER VISITORS TO THE NATIONAL PARK.**

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**PICK UP AND REMOVE ALL LITTER WHETHER IT IS YOURS OR NOT.**

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**ANY UNAUTHORIZED REMOVAL OF ROCKS, FOSSILS, OR ARTIFACTS IS PROHIBITED.**

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**ANY UNAUTHORIZED REMOVAL OF PLANT OR ANIMAL LIFE IS PROHIBITED.**

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**DAMAGE TO VEGETATION, ANIMALS AND/OR THEIR HABITATS IS PROHIBITED.**

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**BE AWARE AND CONSIDERATE THAT THESE ARE RELIGIOUS STRUCTURES. Remember the churches still hold worship services.**

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**DEFACING ANY HISTORIC STRUCTURE IS PROHIBITED.**

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**ANY UNAUTHORIZED DIGGING IS PROHIBITED**