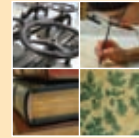




PRESERVATION EDUCATION CURRICULUM



NORTHEAST
DOCUMENT
CONSERVATION
CENTER

CLASS 5 LESSON PLAN

Building-wide Concerns

The Lesson

Materials needed for this lesson may include sample collections materials damaged by heat, humidity, light, pests, and mold; sample environmental monitoring equipment and output/charts; sample integrated pest management traps; and/or blueprints or mechanical drawings from libraries.

Part I: Environmental Effects on Cultural Heritage Collections (1 hour)

A. Harmful effects of environmental factors

1. Temperature/humidity
2. Light
3. Air quality

Show/discuss sample materials that have been damaged by the above factors. In the first portion of the class, the harmful effects of temperature or humidity levels that are too high or too low, different types and levels of light, and air quality, movement, and pollution are discussed. Via sample books and materials affected by extreme environmental conditions, or slide/video images of these materials, students will see actual examples of material deterioration.

B. Best practices/working standards for environmental factors

1. NISO *Environmental Guidelines for the Storage of Paper Records* (recommendations for temperature, humidity, pollutants, and light)
2. IPI's Preservation Index (PI) and Time-Weighted Preservation Index (TWPI)

Ask students to comment on any effects they have noticed on books or other cultural heritage materials that may have been caused by environmental factors such as high or low temperature, high or low humidity, exposure to light, and the quality and movement of air. Develop a list of concerns from the students as a way to lead into discussion of recommended levels and best practices for controlling these effects. Introduce the concept of IPI's Preservation Index (PI) and Time-Weighted Preservation Index (TWPI). Discussion of current best practices or "working standards" in the field should include mention of the varying research results and viewpoints that continue to appear in the study of cultural heritage environmental control. Achieving stability in all of these factors is a key learning outcome. At the end of this section, ask students to identify preservation-standard levels for each of the environmental factors discussed.

In-Class Activity

- Have students work in groups to discuss the environmental factors in their workplace and/or positive and negative environmental conditions in cultural heritage institutions they have visited or where they have previously worked. Have them list these in “positive” and “negative” columns. These can then be revisited in Part III of this lesson, where students brainstorm strategies for correcting the problems.

Part II: Monitoring the Environment (45 minutes)**A. Guidelines and methods for environmental monitoring**

1. Temperature and humidity monitors
2. Light/UV monitors
3. Monitoring pollutants

Review the key points of the NEDCC leaflet “Monitoring Temperature and Relative Humidity.” Through photographs, video or Web clips, or actual sample measuring devices, show examples of the types of equipment used to monitor and report environmental levels, including min/max digital thermohygrometers, recording hygrothermographs, dataloggers, light meters, and UV meters. Because testing for pollutants can be relatively expensive, the instructor should also be prepared to describe some of the accepted testing practices.

B. Biological challenges, or “environments gone bad”

1. Pest infestation
 - a. Integrated pest management techniques
 - b. Monitoring with sticky traps
 - c. Nonchemical treatments (e.g., freezing, modified atmospheres)
2. Mold outbreaks
 - a. Factors that contribute to mold growth
 - b. Prevention strategies
 - c. Health hazards and personal protective equipment
 - d. Basic response procedures (emphasizing that if mold affects a significant amount of material, assistance from an outside vendor will be needed)

Use sample pest-damaged and mold-damaged materials (actual materials, slides, or video footage) to show the effects of pest and mold on library and cultural heritage materials. Since significant mold damage is more common than significant pest damage, more time should be spent on section B2.

Emphasize how quickly damage can occur, particularly when mold is involved. When discussing pest management, show samples of sticky traps used for pest monitoring and ask students to brainstorm other nonchemical strategies that might prevent infestation. Warn against treatment options that are not recommended, including chemical treatment, heat, gamma radiation, and microwaves. When discussing mold, emphasize that high humidity and high moisture content within the affected materials are the crucial factors in mold growth. Have students brainstorm preventive measures and discuss basic response procedures. It is important to convey to students that mold can be a serious health hazard and that no one should ever work with moldy materials without personal protective equipment (PPE).

In-Class Activities

- Provide sample hygrothermograph charts or datalogger records to review with the class. Ask students what conclusions they would draw about the environment from these records and how environmental conditions might need to be changed.
- Ask students to break into groups and describe mold or pest damage they have seen, or any workplace situations in which they have encountered mold or pests. What was done right in responding to these problems, and what was done wrong? How would they have changed the response?

Part III: Building Design and Environmental Systems (1 hour)

A. Building design for preservation

1. Building maintenance
2. Building construction and renovation projects (in brief)

B. Heating, ventilation, and air-conditioning systems (HVAC)

1. Types of systems
2. Typical HVAC problems

C. Controlling light

1. Ultraviolet light
2. Visible light

D. Fire protection

1. Fire prevention (including fire safety inspections, fire drills)
2. Fire detection systems (heat and smoke detectors, system controls)
3. Fire suppression systems (fire extinguishers, sprinkler systems, gaseous suppression systems, water mist systems)

E. Security

1. Automated systems
2. Policies and practices (including reading room rules, marking of collections)

This portion of the class illustrates how good building infrastructure and design of the building with preservation in mind can have a positive effect on the life span of collections. The goal is to familiarize students with the types of building systems required to provide a preservation-quality environment for collections. If possible, bring in blueprints or mechanical drawings of libraries or other buildings to show the proper placement of environmental control, fire protection, and security systems, and then lead into a brief description of the types of systems, with slide or video illustrations of those systems. See the in-class activity suggestions below for additional practical reinforcement.

In-Class Activities

- Ask students to locate ingress and egress routes from the classroom and the building, locations of fire extinguishers, and evidence (or lack of evidence) of security and fire detection and suppression systems in the classroom and building. This would be best done as a “walk-through”

by the class of parts of the building. This activity will prepare students for **Class 7: Surveys and Assessments**, as well as for system identification in their workplace and other cultural heritage institutions that they visit in the future.

- Break students into the same groups as in Part I of the lesson. Revisit the “positive” and “negative” environmental factors that students identified in their workplace and/or in cultural heritage institutions they have visited or where they have previously worked. Have students brainstorm strategies for correcting the problems that were identified.
- Provide one or more case histories of library and museum security breaches or theft, and ask how students would prevent such incidents. Also have them role-play how they might handle a situation in which they suspect a patron of stealing collection materials.

Suggested Graded Assignments

- If the instructor can secure “loaner” equipment, ask students to monitor temperature, humidity, and light levels in their homes, and report the conditions to their classmates by the time of **Class 7: Surveys and Assessments**. This will familiarize them with equipment to be used in that class, and give them practice in using the equipment and reporting to colleagues on environmental conditions in their workplace.
- Write a memo to an imaginary library director regarding the condition of collections in a library, arguing for environmental improvements to increase the life span of collections.
- For students working in an institution, design a customized building maintenance schedule for that institution, assigning responsibilities for periodic inspection and maintenance of building components (roof, drainage, plumbing, electrical, etc.) and building systems (HVAC, fire detection, etc.).
- For students working in an institution, design an environmental monitoring program for that institution. Indicate what types of monitors will be used, where they will be located, and who will be responsible for maintaining them, recording the data, and analyzing the data.

Suggested Term Projects

- Write a report on an environmental-related problem, monitoring system, or pest/mold incident at the student’s workplace or a local institution of interest, and suggest how practices learned in this class module could be used to improve the situation or could have been used to respond better to the problem.