

Restoration Project Poster Boards

Program Type: Classroom, afterschool, or community center program	Audience Type: Grades 6–8, ages 11–14 (emphasis on Native youth)
Program Length: 1–2 hours	Class Size: Up to 30 students

Description: Students work in small groups to research a restoration project and create a poster board collage on how science and traditional knowledge* are being used for environmental and cultural restoration. Students make a short presentation on their collage, which is put on display in a classroom or museum hosting the *Roots of Wisdom* exhibition.

**Traditional knowledge refers to information, skills, and practices that are developed, sustained, and passed on from generation to generation within a community.*

Topics: Traditional Knowledge, History, Environmental Science, Generational Learning, Careers in Science

Process Skills Focus: Critical thinking, research, reading, writing

LEARNING OBJECTIVES

For Next Generation Science Standards alignment, see end of outline.

- Students will understand that there are many cultural and environmental restoration projects happening around the country
- Students will research a specific restoration project related to a Native community
- Students will learn about contributions of traditional knowledge and Western science to restoration projects

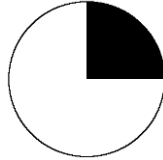
TIME REQUIRED

Advance Prep



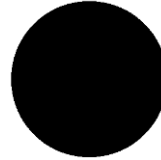
60 minutes

Set Up



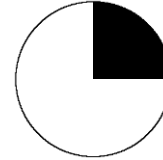
15 minutes

Activity



60+ minutes

Wrap-Up



15 minutes

PROGRAM FORMAT

Segment

Introduction
Videos
Creating Poster Boards
Group Presentations

Format

Instructor-led discussion
Instructor-led discussion
Participant-led group activity
Participant-led group discussion

Time

10 min
5–10 min
30–40 min
10–20 min

SITE REQUIREMENTS

- Access to tables or floor space large enough for groups of 2–3 students to create poster board collages with arts and craft supplies
- Access to a chalk or dry erase board
- Access to a computer and projector for screening introduction videos
- Access to computers or iPads (1 per 2–3 students) **or** printed materials for researching restoration projects (*see Advance Preparation for more details*)

SUPPLIES

Supplies	Amount	Notes
Chalk board or dry erase board	1	Large enough for students to come up and write notes
Computer (preferable)	1	For watching intro videos
Projector (preferable)	1	For watching intro videos
Computers or iPads (optional)	1 per group of 2–3 students	For researching information. Printed materials can be used as an alternative.
Printer (optional; color printer preferred)	1	For printing information and graphics for poster boards
Tables or group of desks	1 per group	For assembling poster boards (students can work on the floor as an alternative)
Poster boards (around 64 cm × 64 cm or 24" × 24")	1 per group	Cardboard or foam core could also be used
Markers	5 per group	A variety of colors
Scissors	1 per student	
Glue stick	1 per group	
Pencils	1 per student	For taking notes / making a draft

ADVANCE PREPARATION

- Instructor should find one local restoration project for each group of students to research. Making contact with local tribal offices such as the Department of Natural Resources is a good place to start. As an alternative, students can research one of the several projects highlighted on either the [Roots of Wisdom](http://omsf.edu/exhibits/row/)¹ or [American Indian Responses to Environmental Challenges](http://www.nmai.si.edu/environment/)² websites if local stories are difficult to find.
- Instructor can select a limited amount of information on each restoration project to print for each group instead of having students use computers or iPads. Printing extra-large font works well for students to read over as a group and for cutting and pasting onto poster boards.
- Each group should have at least 3–5 images printed out to cut and paste onto poster boards. Students can draw pictures as an alternative.

¹ <http://omsf.edu/exhibits/row/>

² <http://www.nmai.si.edu/environment/>

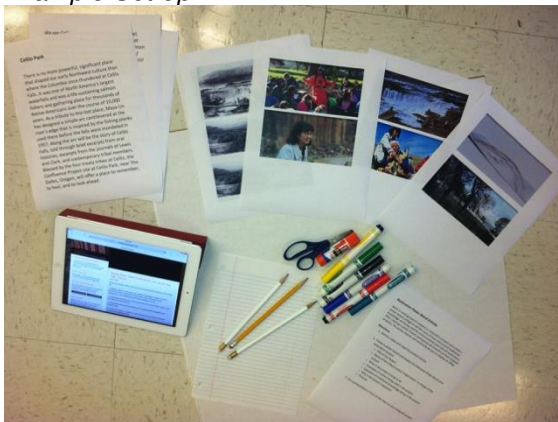
- Select 2–3 students who can work well together for each group.
- If students are a different ages and have varying reading abilities, adjust the amount of research information assigned to the groups.

SET UP

15 minutes

- Set-up computer and projector (if available) to display introduction videos.
- Give each group of students all materials needed to research a restoration project and create a poster board:
 - Poster board
 - Computer or iPad and printer **or** pre-printed information and graphics
 - Markers
 - Scissors
 - Glue
 - Pencils

Example Set-up:



INTRODUCTION

10 minutes

Let students speculate before offering answers to any questions. The answers given are provided primarily for the instructor's benefit.

Suggested script is **shaded**. Important points or questions are in **bold**. Possible answers are shown in *italics*. Feel free to improvise as needed.

To begin the activity, draw a vertical line down the middle of the board and write “science” on one side and “traditional knowledge” on the other.

Introduction

Today we are going to learn about environmental restoration projects, why they are important and how people can use information shared by scientists and Native Americans to care for the Earth.

Environmental restoration can happen in a variety of situations. Restoration projects are sometimes very involved, like removing a parking lot to plant Native plants or re-directing the flow of a river to restore salmon habitats. These projects rely on heavy equipment like cranes and bulldozers. Often projects are much smaller, like digging out invasive species from a backyard using common gardening tools like rakes and shovels. Sometime these projects need to be informed by professionals like scientists and engineers and sometimes they can be led by whoever feels passionate about caring for the Earth. **Let's think about projects happening around our local area. Can anyone name an example?** *My mom removed blackberry bushes in our backyard, people planted trees along our road, I saw people working on the river to help fish, etc.* Those are all good examples. **Can you now tell me why these projects are important?**

Building on projects happening in the local area and those that students may have named as examples, discuss why environmental projects are important to heal and protect the Earth.

Let's now think about useful information for carrying out an environmental restoration project. For example, it might be important to know what the place looked like before it was impacted by people, what plants and animals used to live there, etc.

What else can you think of that's important to know about a restoration project?

Let's now focus on how science and knowledge shared from Native Americans, often called traditional knowledge, can help restore the environment.

What comes to mind when you think of science and the environment?

Science can be very broad, so think big!

A person studying water, learning about the weather, animals, plants, test tubes, experiments, etc.

Have students brainstorm what science is in the broadest sense and have them write comments on the board to create a list to reflect upon during the activity.

That's a great list. Let's now think about what comes to mind when we think about information shared by Native Americans, which we call traditional knowledge. I'll give you some background information. People often refer to traditional knowledge as information passed down from one generation to another. Think about facts you have learned from people older than you. Raise your hand if you know people who are at least two generations older than you. These people could either be your grandparents or other people in your community of the same generation or older.

Provide the students with a real-life example. Tell a personal story of something you learned from a person of an older generation or make up a story that students can relate to.

Example story:

My grandfather loved to fish. He knew how to identify many different species of fish and which tasted the best. He taught me to be patient when catching fish, since he knew that the fish wouldn't always be easy to find and trap. He never got frustrated when he didn't catch fish and he was confident that he would come back another day to fish and be successful then.

Optional Enrichment

If students identify as Native American or indigenous of another culture, ask if anyone in the class has an example to share of something they learned about their people and culture from someone who is older than them, like a grandparent or tribal elder.

Traditional knowledge can be expressed in many ways through storytelling, rituals, songs, crafts, or gathering food. Traditional knowledge can be another way of learning or knowing and can be just as valuable as learning facts in a more scientific way. **Now that you have a little background, what comes to mind when you think of traditional knowledge?** Possible answers: *cultural traditions, storytelling, dancing, woodworking, harvesting food, animals, hunting, where to find food, plants, medicine, witnessing climate change, etc.*

See the Resources section below for reading more on traditional knowledge (often referred to as Traditional Ecological Knowledge).

We are now going to watch a couple of videos about environmental and cultural restoration projects using both science and traditional knowledge to help restore the environment and Native culture. After the videos, I'll assign you to groups of 2–3 students and you'll create a poster board about a restoration project that is either happening around our local community or is highlighted on a museum website.

Optional Enrichment

If students have the chance to visit the *Roots of Wisdom* exhibition, review the content in the exhibition and relate it to the conversation. See optional extensions section for more information.

INSTRUCTOR-LED DISCUSSION

Videos

5 – 10 minutes

Both the [Roots of Wisdom](#)³ and [American Indian Responses to Environmental Challenges](#)⁴ websites have videos telling stories of environmental and cultural restoration projects happening in Native communities around North America. The *Roots of Wisdom* website has four short 2–3 minute videos that focus more on traditional knowledge. The [American Indian Responses to Environmental Challenges](#) website has several longer videos on four other restoration projects. These videos are good to show if there is more time to complete this activity. Instructors are encouraged to start with the video referenced below and explore both websites to get an idea of how science and traditional knowledge are being used in a variety of situations.

The first film we are going to watch is about restoring a native bamboo plant in North Carolina called [Re-establishing a Native Plant](#)⁵. It was filmed for an exhibition created by the Oregon Museum of Science and Industry (OMSI) in Portland, Oregon. This film is about how the Eastern Band Cherokee are working to restore habitat for river cane, a type of bamboo. The film also discusses the cultural traditions that the plant is used for.

After the film, ask students what they saw in the film that relates to science and traditional knowledge.

³ <http://omsi.edu/exhibits/row/>

⁴ <http://www.nmai.si.edu/environment/>

⁵ <http://omsi.edu/exhibits/row/meet-the-communities/choerokee>

GROUP ACTIVITY**Creating Poster Boards**

30 – 40 minutes

Now that you have seen an example of how a museum highlighted a restoration project that uses both science and traditional knowledge, it's your turn to create a poster board to tell the story of a different project.

Assign the students to groups of 2–3 students and hand out all of the materials needed to complete the project.

You should have all the materials needed to complete the project. Here is a handout with your directions.

Provide each group with a handout of directions.

The poster boards can go on display in either the classroom, somewhere else in a school or ideally in a museum hosting the *Roots of Wisdom* exhibition. Museums can use the poster boards to supplement the exhibit and highlight restoration projects happening in their local community.

Handout

(Available for download as a Microsoft Word document at:
<http://omsi.edu/exhibits/row/education-resources/>)

Restoration Poster Board Activity

Work in small groups to research a restoration project and create a poster board collage to tell the story of how traditional knowledge and science are used for environmental and cultural restoration. After creating the poster boards, each group will present their board and talk about their project.

Directions

Create a poster board highlighting the following information:

1. Name of the project
2. Name of the Native community working on the project
(*There may be more than one*)
3. What the project is about
4. Examples of how science is being used
5. Examples of how traditional knowledge is being used
6. Why this project is important
7. Pictures of the restoration project (at least 3-4)

PARTICIPANT-LED GROUP

Group Presentations

10 – 20 minutes

Ask each group of students to make a short presentation of their poster board. Students can use their direction sheet as a guide for their presentation. Have each group share the following:

1. Name of the project
2. Name of the tribe or Native community working on the project
3. What the project is about
4. Examples of how science is used
5. Examples of how traditional knowledge is used
6. Why the project is important

OPTIONAL EXTENSIONS

- Take a field trip to a museum hosting the *Roots of Wisdom* exhibition and challenge students to find examples of science and traditional knowledge as they move through the exhibit components. Lead a group discussion near the exhibit afterward and have students share what they learned about science and traditional knowledge.
- Talk with museum staff about displaying the poster boards in the museum to highlight restoration projects happening in the local community.
- Educators could involve students in an actual restoration project and create a poster board about that project.

RESOURCES

Links to videos:

- [Roots of Wisdom](#)⁶
- [American Indian Responses to Environmental Challenges](#)⁷

Links and resources for cultural guides:

- [Alaska Native Knowledge Network](#)⁸
- [Guide to Implementing the Alaska Cultural Standards for Educators](#)⁹
- [Indian Education for All - Montana Office of Public Instruction](#)¹⁰
- [Navajo Culture](#)¹¹

GLOSSARY

Vocabulary	Definition
Elder	A person who has gathered knowledge and wisdom about his or her culture; not all elderly people are elders
Indigenous/Native	An individual who has an ancestral claim to a particular environment or region
Traditional knowledge	Wisdom held by elders that is passed down to younger generations
Ways of knowing	Information gained by patient observations, life wisdom, and accumulated knowledge
Western science	A system of knowledge which relies on certain laws that have been established through the application of the scientific method to phenomena in the world around us

⁶ <http://omsi.edu/exhibits/row/>

⁷ <http://www.nmai.si.edu/environment/>

⁸ <http://ankn.uaf.edu/Publications/Knowledge.html>

⁹ https://education.alaska.gov/standards/pdf/cultural_standards.pdf

¹⁰ <http://opi.mt.gov/programs/indianed/IEFA.html>

¹¹ http://serc.carleton.edu/research_education/nativelands/navajo/culture.html

NEXT GENERATION SCIENCE STANDARDS

Practices

- Asking questions and defining problems
- Planning and carrying out investigations
- Analyzing and interpreting data
- Obtaining, evaluating, and communicating information

Crosscutting Concepts

- Patterns
- Cause and effect
- Scale, proportion, and quantity
- Structure and function
- Stability and change

	Disciplinary Core Idea	K	1	2	3	4	5	MS	HS
Physical Science									
PS1	Matter and Its Interaction	n/a	n/a		n/a	n/a			
PS2	Motion and Stability: Forces and Interactions		n/a	n/a		n/a			
PS3	Energy		n/a	n/a	n/a				
PS4	Waves and Their Applications in Technologies for Information Transfer	n/a		n/a	n/a		n/a		
Life Science									
LS1	From molecules to organisms: Structures and processes			n/a					
LS2	Ecosystems: Interactions, Energy, and Dynamics	n/a	n/a			n/a		✓	✓
LS3	Heredity: Inheritance and Variation of Traits	n/a		n/a		n/a	n/a		
LS4	Biological Evolution: Unity and Diversity	n/a	n/a			n/a	n/a		
Earth & Space Science									
ESS1	Earth's Place in the Universe	n/a			n/a				
ESS2	Earth's Systems		n/a						
ESS3	Earth and Human Activity		n/a	n/a					
Engineering, Technology, and Applications of Science									
ETS1	Engineering Design								