

## Standard Three – Lesson One

**Achievement Goal:**  
Explain the following terms and relate to traditional values: "natural resources", "interdependence", "ecology", "biodiversity", "sustainability", and "biomimicry".

**Time:**  
2-3 class periods

**Core:**  
Natural Sciences



**For Grades 4-5**

Indian Land Education

# Contemporary American Indian Land Issues



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### Background:

"Once you learn to read the land, I have no fear of what you will do to it, or with it. And I know many pleasant things it will do to you."  
- Aldo Leopold, conservationist.

As generation after generation lives on the same land, people develop an intimate understanding of that place. They adapt to the needs and demands of the land and the land in turn sustains them into the future.

This type of relationship characterized the life-ways of many American Indian tribes before the arrival of non-native settlers. In order to survive, it was necessary for native peoples not only to have extensive knowledge about foods and natural materials to make shelter and clothes, but they needed to know what to do (or avoid doing) to the environment which enabled it to yield the things they needed to survive.

Thus, Indian ancestors already knew about several concepts that are often used when modern natural or social scientists discuss ways in which modern society should reduce the destructive impact it has on the natural environment. Such terms include "natural resources", "interdependence", "biodiversity", "sustainability", and "biomimicry".

This lesson will introduce these terms to students and discuss the how they relate to Indian land values. Students will explore the meaning of these terms by studying the ecosystem of the Great Plains prairie.

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## Preparation:

- Vocabulary Terms: natural resources, interdependence, ecology, biodiversity, sustainability, and biomimicry.
- Review the following websites, which contain several video clips and lesson plans that will present to the students the main ideas of this lesson:
  - <http://catlinclassroom.si.edu>. The Smithsonian Institution's educational website about landscape painter George Catlin. For the purposes of this lesson, select the "Western Landscape" section of the site, and of the figures around the campfire, select the video segment "Wes Jackson: The Changing Ecology of the Prairie." Review the lesson plan "At Home on the Prairie" in the "For Teachers" section of the website at <http://catlinclassroom.si.edu/lessonplans/wl-c.html>.
  - <http://www.intertribalbison.org/main.asp?ID=1>. Review the history and mission of the Intertribal Bison Cooperative.
  - <http://www.pbs.org/saf/1106/segments/1106-1.htm>, <http://pbs.org/saf/1106/teaching/teaching.htm>. PBS's Scientific American Frontiers. Review the article "Prairie Comeback" and the lesson plan for the activity "Growing Prairie". Assemble the materials necessary for your students to perform a simple experiment revealing the important role bison and occasional prairie burns had on the ecology of the Great Plains.
  - [http://www.pbs.org/americanfieldguide/teachers/native\\_species/native\\_species\\_unit.html#](http://www.pbs.org/americanfieldguide/teachers/native_species/native_species_unit.html#), PBS American Field Guide lesson on native species restoration. The video clip "Return of the Wolf" in activity 1 tells the story of the successful reintroduction of the grey wolf into Idaho by the Nez Perce Tribe.
- Set up internet access in a way that allows you to present the relevant sections of the websites above to the students.
- Print off copies of the Cris Cross puzzle at the end of this lesson to hand out to the students.

## Student Activity (Day 1):

- Using the webpage "Prairie Comeback", introduce the students to the concept of an ecosystem, in which a community of organisms in the environment sustains itself and works as a unit. Point out that the great diversity of plants on the prairie were hearty in terms of surviving fires. After the fires, the green shoots of the new plants fed bison. The bison, on the other hand, helped the plants grow because they reduced the groundcover that would hinder the growth of the plants. The interdependence of hearty plant diversity, occasional fires, and bison helped sustain the health of the prairie and the existence of the organisms living in that environment.
- Show Walter Bigbee's presentation on the importance of buffalo to native tribes to your students, using the transcript of Bigbee's presentation to narrate the slide show.
- Using the information above as an example, help the children define the following terms:
  - **Ecosystem** - A self-sustaining area in the environment; a natural community of organisms in the environment.
  - **Natural resources** - A resource is something that is used for support or help. A resource may be a person, such as a parent or teacher or relative, or a thing, such as a dictionary. A natural resource is a thing that comes from nature that supports or helps animals or people. It is a gift from nature that we rely on.
  - **Interdependence** - Organisms depending on each other for their mutual survival.
  - **Biodiversity** - The variety of living things in an ecosystem. Biodiversity is created when organisms adapt to the environment in different ways over a long period of time. When they adapt to the environment, they usually begin to rely on other organisms in the environment and other organisms also rely on them.
  - **Observation** - Closely watching something or someone in order to learn from them.
  - **Sustainability** - Making sure the environment is healthy and supports people in the future.
  - **Biomimicry** - Learning from and imitating things in nature in order to make man-made things and processes better.

- **Habitat** - An area where an organism or natural community lives.
- With these ideas in mind, have the children follow the “Growing Prairie” activity and record their observations over the next few weeks. Make sure the children understand why they are doing this activity by repeating the terms above and asking them how they relate to the activity.
- Write the terms on the board and have the students complete the Criss Cross puzzle appended to this lesson. Have them attach it to the sheets where they will be recording their observations for the “Growing Prairie” Activity.

### **Student Activity: (Day 2)**

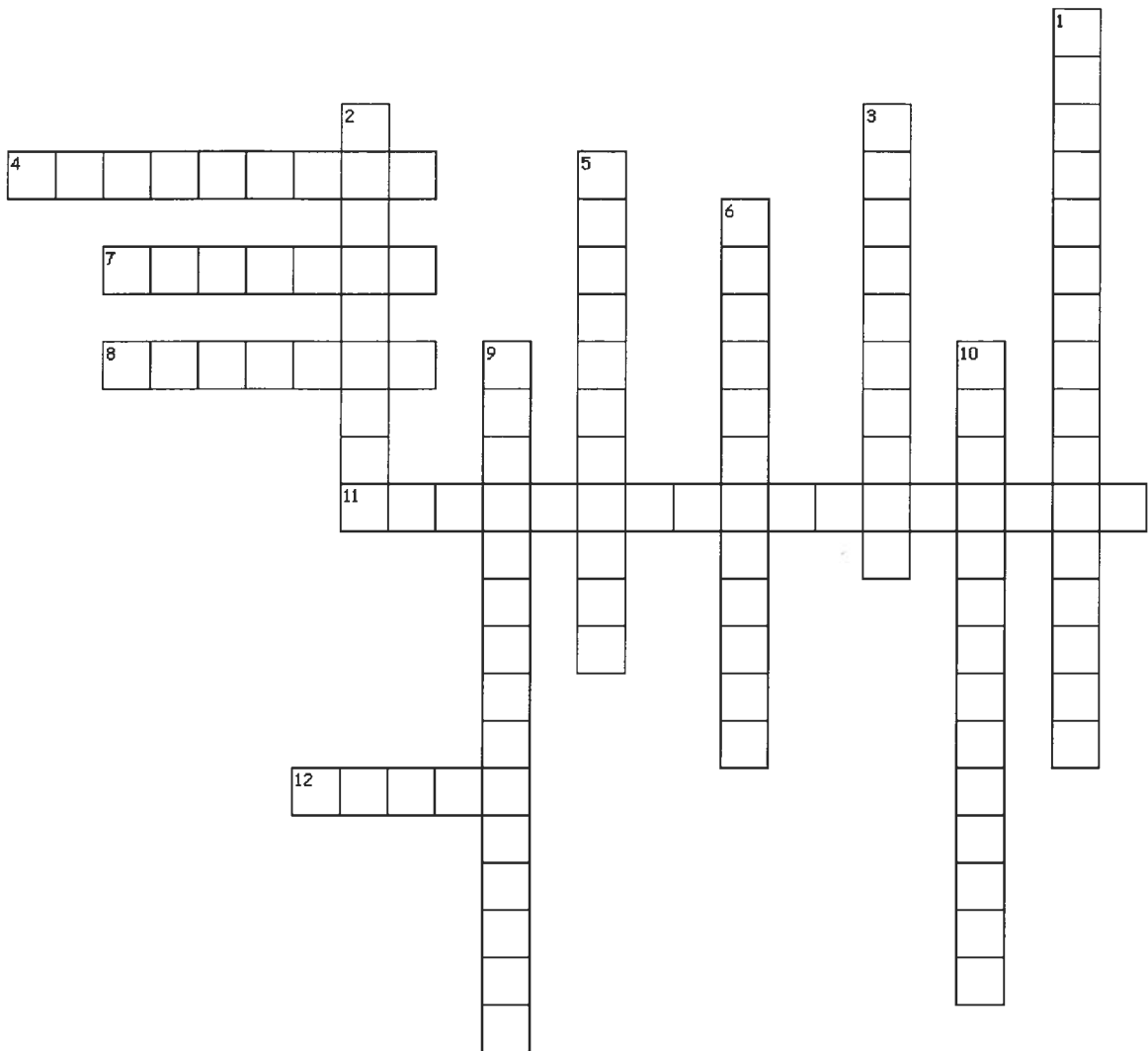
- Begin the lesson by discussing how bison were important to tribes in the Great Plains. Ask the students why such an animal would be important to the tribes.
- Have the children view the online “campfire story” video clip at <http://catlinclassroom.si.edu> entitled “The Changing Ecology of the Prairie” in the Western Landscape portion of the website.
- After the clip has been shown, explain to students that Indian people are now reintroducing bison into areas where they were exterminated long ago. Using the Intertribal Bison Cooperative website listed above, describe the cooperative to the students and the organization’s mission.
- Discuss how other tribes are doing similar things with other animals and habitats. Have the students view the “Return of the Wolf” video at PBS’s American Field Guide website mentioned above. After the clip, ask the students to compare and contrast the two projects. As an example, point out that the wolf is a predator and the bison is a plant-eater. Have the children think about the effects this difference creates in reintroduction of the animals to their original habitats.
- Ask the students to perform Activity III in the “At Home on the Prairie” lesson plan at the Catlin website. This will give the children a chance to think about their own environment and homeland. When researching and writing about natural resources and endangered animals, have them use at least 5 of the words found in the Criss Cross puzzle attached to their “Growing Prairie” observations.

### **Evaluation:**

- Assess the student’s understanding of the terms and how they relate to traditional land values.
- Assess the student’s ability to think of the environment and ecology in a holistic manner.
- Assess the student’s ability to make observations and record them during the “Growing Prairie” activity.
- Assess the student’s ability to apply the terms to a variety of situations – the study of the prairie, the Nez Perce reintroduction of the wolf into parts of Idaho, and in their research and writing about their own community environment.

### **Resources:**

1. <http://catlinclassroom.si.edu>, The Smithsonian Institution's Campfire Stories with George Catlin
2. <http://www.intertribalbison.org/main.asp?ID=1>, Intertribal Bison Cooperative
3. <http://www.pbs.org/saf/1106/segments/1106-1.htm>, PBS, Scientific American Frontier
4. <http://www.pbs.org/americanfieldguide/>, PBS, American Field Guide
5. <http://www.cbc.ca/natureofthings/features.html#>, CBC, background on biomimicry.
6. <http://puzzlemaker.school.discovery.com>, Criss Cross Puzzle generator



**Across**

- 4. A community of organisms and their environment that works as an ecological unit
- 7. An area in which an organism or natural community lives
- 8. A complex grasslands ecosystem
- 11. The children of the future
- 12. Large prairie animals with fur, hooves and horns

**Down**

- 1. Gifts of nature we rely on
- 2. Extended family members
- 3. Learning from and imitating things in nature
- 5. Watching in order to learn from something or someone
- 6. The variety of living things
- 9. Organisms depending on each other to exist
- 10. Keeping the environment healthy into the future

## ANSWERS

### Across

4. A community of organisms and their environment that works as an ecological unit (*ecosystem*)
7. An area in which an organism or natural community lives (*habitat*)
8. A complex grasslands ecosystem (*prairie*)
11. The children of the future (*Seventh Generation*)
12. Large prairie animals with fur, hooves and horns (*bison*)

### Down

1. Gifts of nature we rely on (*natural resources*)
2. Extended family members (*relatives*)
3. Learning from and imitating things in nature (*biomimicry*)
5. Watching in order to learn from something or someone (*observation*)
6. The variety of living things (*biodiversity*)
9. Organisms depending on each other to exist (*interdependence*)
10. Keeping the environment healthy into the future (*sustainability*)