

A TRIBAL EDUCATIONAL APPROACH ON ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

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ABSTRACT

The Nez Perce Environmental Restoration and Waste Management accepts the opportunity to direct the Nez Perce Tribal Foundation's Two World-View Environmental Education Project. The goal of this project is to improve critical thinking, problem solving and effective decision making skills of students and future educators by providing learning experiences that have real world applications. The ERWM Department commits its educational and scientific expertise to design and implement a culturally relevant environmental education curriculum. The development of math and science curriculum with an emphasis on cultural/environmental issues is crucial for the success of on reservation American Indian elementary and secondary students. This project addresses the EPA's priority of capacity building and education reform. The curriculum will be delivered through in-class presentations, out of door experiential instruction, a ten-day teacher training summer course and a semester college course. The target audience includes 3,725 K-12 students (of which 824 are American Indian) and 100 teachers on the Nez Perce reservation; 30 university students in natural resources, environmental science and engineering; and 40 university pre-serviced education students and in-service teachers.

A Tribal Educational Approach on Environmental Restoration and Waste Management

High Priority Environmental Issue

The Nez Perce Tribal Foundation and the Environmental Restoration and Waste Management education program agree that ecosystem protection is a high priority environmental issue in the community. However, non-native peoples write environmental education curriculum projects that look at contemporary issues surrounding American Indians. These curriculums do not use the vast knowledge base of the tribal elders. The following is an example of a tribal elder-based environmental curriculum.

The Cycles of Life as told by Camas

By using the camas plant as the central figure, the inter-weavings of the circles of life in both the western and tribal scientific, environmental and cultural concepts, as well as the discontinuities can be demonstrated. The camas can be used to demonstrate the differences between western and tribal worldviews, and both the benefits and the negative impacts of each view. This curriculum is intended to introduce students to the complexity and interdisciplinary nature of common environmental issues.

Theme

The camas (scientific name: *camassia quamash*, Nez Perce: qemes), a simple native lily plant indigenous to the northwestern US, was an important nutritional and ceremonial

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component of north- western American tribal life. The introduction and development of western agricultural practices severely impacted the range and number of the camas, and therefore also impacted the lifestyle, the health, and culture of the tribes dependent on camas. This curriculum uses the camas, in its tribal nutritional context, to introduce the Nez Perce culture, as it differs from the familiar western culture we know, and to contrast the two different cultures' impact on the environment and society.

Objectives

- *Understanding and contrasting the cyclical relationships within both scientific and tribal soil and agricultural philosophies.
- *Exploring the importance of camas to tribal seasonally based lifestyles.
- *Understanding the causes of the decline of the camas, and the impact of the decline on tribal lifestyle. Comparing and contrasting western and tribal views of agriculture, and the impact on camas propagation.
- *Using the example of the camas to explore the similarities and differences between western and tribal worldviews. Develop understanding and respect for other cultures and multiculturalism.

Multicultural Theme

This curriculum is not purely about camas, or purely about soils, but is intended to give the student an exposure to both tribal and western worlds' of thought. It is about the struggle of the Tribal way of life, respecting the Earth and her bounty, in the face of western agriculture and politics. The curriculum is intended for both tribal students and non-tribal students trying to understand the other's worldview. This course content is intended to provide a better understanding of both the western impact of scientific approach on a subject, and also of tribal spiritual ways of knowing and dealing with the environment of which they are a part. Exposure to both worlds of knowledge should bring about a more rounded viewpoint, and a better understanding of the limits of the ultimate "truth" of science. This curriculum also exposes the student to the impacts on tribal culture that have been wrought by the eradication of the formerly extensive camas prairies by western agriculture and politics.

Objective One

Understanding cyclical relationships.

The cyclical nature and intertwining relationships of the camas, of the hydrologic cycle, of the chemical cycles of the soil, of the plant community that the camas lives in, of the animals that also use the environment and of camas-eating Native Americans can be illustrated through the use of circular diagrams. It is important to make this a participatory exercise involving student input into the construction of the circular diagrams.

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Concept

cyclical time Vs linear time

Activities

Time concepts (linear time Vs cyclical time thinking)

Concept

Develop interrelated cycles of nature

Activities

Other related natural cycles

Seasonal cycles

Water cycle

Soil Chemical cycles

(Learned skills)

Hydrology

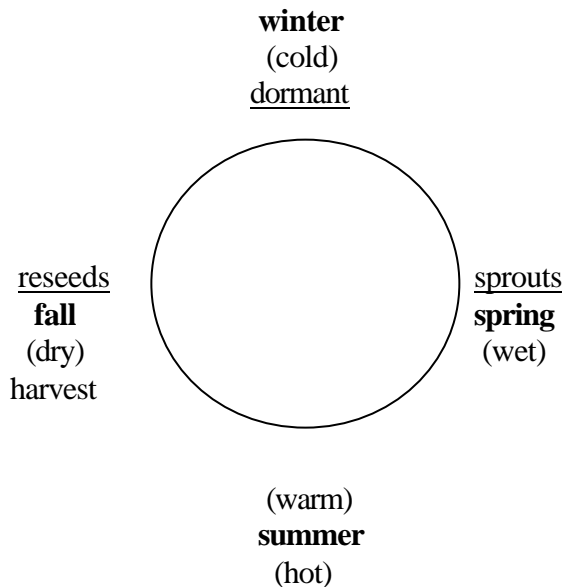
Soil chemistry, Soils, botany, bot.

Relationships

Nez Perce cycles

Native American studies

Example: CAMAS (showing interrelated temperature, soil moisture, and camas growth cycles)



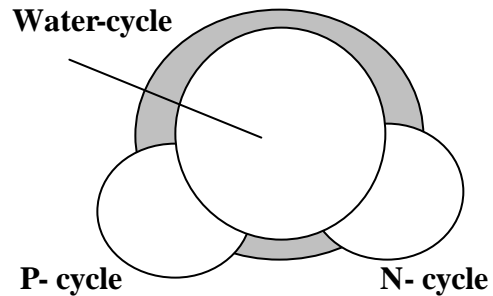
The Nez Perce tribal seasonal living cycle can be intertwined with camas and water cycles to show the interdependence between plant and nature and human beings.

The seasons are **bold**, the camas reactions to seasons are underlined, and the Nez Perce harvest occurs in the late summer or early fall.

Several other linking circles may be drawn, as shown below, to show the relationship of soil chemistry to the seasonal circle, to show how the lifestyle of the camas-eating Tribes interfaces, and any other environmental linkages desired (see Appendix Two, "Tribal Culture in Science").

Example: Interrelated natural cycles

This illustration shows the inter-dependence between the camas cycle (grey), and the seasonal water cycle, the nitrogen cycle which is dependent on nitrogen-fixing plants to re-nitrify the soil, and the phosphate cycle, which is dependent on the natural weathering of P-containing rock materials. These two soil chemical cycles are examples of the many soil cycles that affect the lives of plants.



Objective Two

Relationship of camas and Tribal lifestyle.

Major Concepts

Nez Perce/camas interdependence.

Activities

Explore camas/Tribal interdependence through interviews, and botanical literature review. Write a report of the findings (can be either individually or as a reporting group).

Concept

Traditional gathering methods provide aeration, breaks the competing roots, and scatters camas seeds

Activities

Participate in traditional camas gathering, and evaluate the process as a benefit to the camas plant. Write a short report on the observed activities and the perceived effects.

Learned skills

Botany, plant environments, soil physics.

Concept

Camas as nutrition

Activities

Acquire nutritional and medical information on camas plant, and determine Tribal health before and after advent of introduction of western diet through health records and interviews. Investigate the fructose-carbohydrates-fiber contents of camas and the medical importance of these nutritional elements in terms of diabetes, High-Blood pressure within the tribal setting. Write a report on findings.

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Learned skills

Nutrition, Phyto-medicine

Concept

Comparing Nez Perce and western food philosophies.

Activities

Examine the Nez Perce use of camas as a shared food source versus the western market philosophies of maximum production from the land of a single crop, and the impacts of these philosophies on the environment. Write a short personal interpretation paper.

Learned skills

Economics, market philosophy, Native American Studies.

Objective Three

The causes of the decline of camas and effect on the tribal lifestyle. Compare and contrast the western and tribal agricultural viewpoints, and the impact on Camas propagation.

Concept

The decline of the camas plant.

Activities

Determine historical camas grounds and compare to current camas areas. Determine reason(s) for the demise of camas. Investigate problems (perhaps by assigning different groups to different problems) with Western ownership/plowing and other agricultural practices, Land use planning, cattle grazing damage, and limited traditional gathering access. Investigate the process the U.S. Forest Service used to set aside the Musselshell area for camas gathering by the Nez Perce. Investigate the Nez Perce tribal efforts to buy back camas growing areas from farmers. Look into farming practices that would limit herbicides and plowing to allow camas to repopulate favorable growing areas. Write a report of findings with maps.

Learned skills

Land-use planning, Best Agricultural Management Practices, Mapping skills.

Objective Four

Use the example of the camas to explore the similarities and differences in western and tribal worldviews.

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Concept

Future Camas trends.

Activities

Determine governmental policies on tribal traditional food sources, and on camas. Determine Tribal intentions to replace camas grounds. Determine laws and regulations pertaining to protection of native plant species. Determine whether the U.S. Forest Service plans to set aside additional areas for camas gathering by the Nez Perce. What efforts are the Nez Perce tribe making to buy back camas-growing areas from farmers? Are farming practices that would limit herbicides and plowing to allow camas to repopulate favorable growing areas being suggested and implemented?. Write a report of findings with maps

Learned skills

Environmental mitigation techniques, Orientation and map reading, U.S history and policy.

Concept

Western vs tribal agricultural views including, the Multi-cultural concept and comparisons, mono-culture agriculture versus traditional gathering methods, environmental best-use practices (BMPs), Man's will (western viewpoint) versus nature's bounty (tribal view), and Market versus cooperative lifestyles.

Activities

Classroom discussion of Western vs tribal agricultural views including Multi-cultural concepts and comparisons, mono-culture vs gathering, environmental best-use practices (BMPs), Man's will vs nature's bounty, and Market vs cooperative lifestyles. Ethical comparison of western and tribal worldviews pertaining to impact on the environment, sustainability, agricultural production versus population control, and influence on the population's view of the world. Write a opinion paper.

Learned Skill

Multicultural and ethical skills, application of BMP's, worldview philosophical development.

Critical Thinking Topics

Which approach, the bulk production of food or the traditional gathering of food, is more important as a land use?

Is the western agricultural or tribal food gathering approach best for the environment?

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What is the importance of preserving the camas traditions, and the reestablishment of traditional camas grounds in terms of preserving tribal culture, of multiculturalism and of multiple worldviews?

What are the consequences of losing multicultural worldviews? What does this illustrate about mono-cultural western thinking and practices and loss of diversity as an Environmental Science concept?

The world once gained immense knowledge and resources from the Native Peoples. It is time for the western world to re-think their environmental practices and look towards the vast Native knowledge base. Credit the source, don't exploit the source.