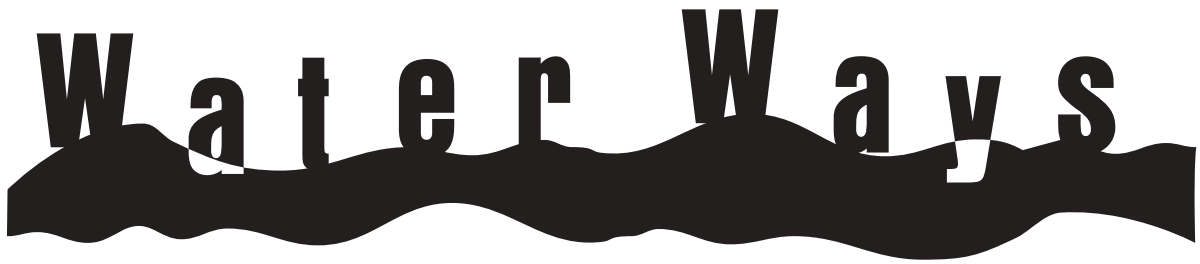


# Water Ways

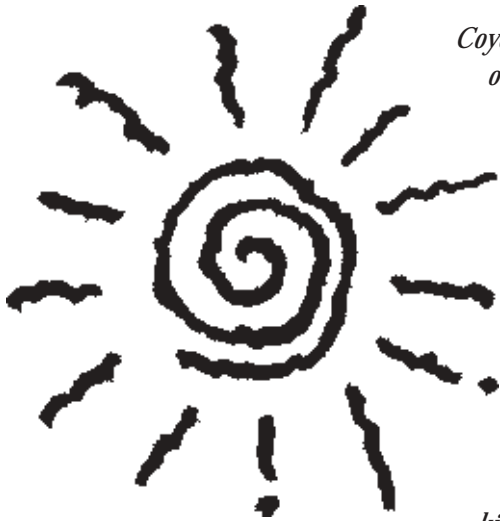


A Middle School Intra-Disciplinary Curriculum  
focused on exploring the Ecology, Economy and Equity of  
the Lake Roosevelt Watershed

## The Origin of the Columbia River

.....

*Long ago, when Coyote was the big man on the earth, this valley was covered by a big lake. At that time there was no Columbia River. West of us, between the lake and the ocean was a long ridge of mountains. But the Columbia River did not go through it. Indians today believe that.*



*Coyote was smart enough to see that salmon would come up from the ocean to be food for his people here if he would make a hole through the mountains. So he went down to a place near where Portland is now, and with his powers he dug a hole through the mountains there. The water went through the hole and on to the ocean.*

*The water in the big lake up here drained, and the water flowing out of it made the Columbia River. Coyote got the Columbia to flow through that hole, the way it does today. Then the salmon came up the river to this part of the country. His people after that had plenty to eat.*

*When he dug that hole through the mountains, Coyote made a kind of bridge. You have heard of it - a broad rock bridge that went across the river. People could walk from one side of the Columbia to the other. Along time afterward, an earthquake broke the bridge down. The rocks that fell into the water formed the Cascades of the Columbia. They made it hard for boats to go up and down the river there.*

This version of the story was told by Peter Noyes, a Colville Indian, in 1951, who claimed he had first heard it nearly eighty years previously. In the last half-century, geologists have come to believe that vast parts of the Inland Northwest were covered by lakes. The last one was at the end of the last ice age, 12,000 years ago.

From *Indian Legends of the Pacific Northwest*, edited by Ella E. Clark, University of California Press, 1953

## Welcome

.....

**W**elcome to the Water Ways Curriculum! Our goal is to provide students a way to explore the watersheds that make up the greater Lake Roosevelt Watershed. The purpose of the Water Ways Curriculum is to nurture understanding of the Lake Roosevelt watershed for a more sustainable environment for everyone . . . people and nature.

Our historical relationship to this watershed offers us a unique opportunity to learn from our past behaviors and chart a course for the future. This curriculum offers students an opportunity to explore and identify ways that residential, business and industrial uses, as well as agricultural/resource extraction practices directly affect the community's water quality. Students are encouraged to develop active listening and collaborative skills to create a future based upon sustainable community practices.

The following is a list of goals and objectives from the Washington State Essential Academic Learning Requirements for the "Water Ways" curriculum.

- 1) The student will be able to recognize different types and purposes of maps.
- 2) The student will be able to locate places in the Lake Roosevelt watershed using the coordinates on a grid system.
- 3) The student will use and construct maps, charts, and other resources to gather and interpret geographical information.
- 4) The student will understand how physical processes and human activities can impact one another.
- 5) The student will be able to exercise decision-making skills at many levels.
- 6) The student will identify and compare historical accounts and artifacts from multiple perspectives.
- 7) The student will compare and contrast interpretations of major events selected from Pacific Northwest history.
- 8) The student will interpret how ideas and attitudes have shaped and been shaped by changing technology.
- 9) The student will identify and examine a variety of perspectives regarding the interaction between people and their environment.

This curriculum can be used sequentially or when time permits. Each unit can stand-alone or be coupled with other learning opportunities. Our recommendation, however, is to plan for a two week period to complete the three units in sequence.

## Water Ways Development Team

Water Ways is a thematic intra-disciplinary curriculum focused on the environment of the Lake Roosevelt watershed. Water Ways explores aspects of ecology, economy and equity of the local watershed in an attempt to lay the inter-generational foundation for changes in the students' awareness, attitudes, and individual and collective behaviors.

Development of this project was made possible by grants from the State of Washington Department of Ecology's Public Participation Grant Program awarded to: The Lake Roosevelt Forum and The Lands Council.

The Lake Roosevelt Forum is a Washington non-profit corporation committed to the environmental and economic well-being of the communities that comprise the Lake Roosevelt region.

The Lands Council is a Washington non-profit corporation dedicated to preserving and protecting woods, waters and wildlife of the Inland Northwest.

For additional information about this program, contact: The Lake Roosevelt Forum 1404 N. Thor Ct., Suite 112 Spokane, WA 99202 509-535-7084 e-mail: info@lrf.org

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**Coming soon -**  
**Lake Roosevelt Forum website at:**  
**[www.lrf.org](http://www.lrf.org)**

**See Water Ways website at:**  
**[www.lsw.org/scd](http://www.lsw.org/scd)**

Please feel free to direct any questions or comments to Andy Dunau, Executive Director or Alison Squier, Program Coordinator of The Lake Roosevelt Forum: ph: 509-535-7084/e-mail: info@lrf.org/fax: 509-535-3986



## Lake Roosevelt Water Ways Sponsors



Bonneville Power Administration

Bureau of Reclamation

Colville Tribal Enterprise Corporation

Confederated Tribes of the Colville Reservation

Grant County

Lincoln County

National Park Service

Spokane Tribe of Indians

Stevens County

Washington Dept. of Ecology

# Social Studies Correlation to the Washington State Essential Academic Learning Requirements

.....

## History - Benchmark 2

2. The student applies the methods of social science investigation to investigate, compare and contrast interpretations of historical events.

### 2.1 investigate and research

identify social issues and define problems to pose historical questions

Costs & Benefits of Resources - page 20-22

Where are we going from here? - page 36

locate sources of information and obtain information from a variety of sources including graphs, charts, tables, maps, diagrams, texts, photographs, documents, and interviews

Water Taste Test - page 10

### 2.2 analyze historical information

organize and record information

Cost & Benefits of Resources - page 20-22

distinguish fact from judgement and opinion; recognize stereotype; compare and contrast historical information

Cost & Benefits of Resources - page 20-22

### 2.3 synthesize information and reflect on findings

interpret and synthesize information; express findings

Exploring Interrelationships - page 8

propose alternative ways of analyzing and interpreting findings

Exploring Interrelationships - page 8

3. The student understands the origin and impact of ideas and technological developments on history and social change.

3.2 analyze how historical conditions shape ideas and how ideas change over time

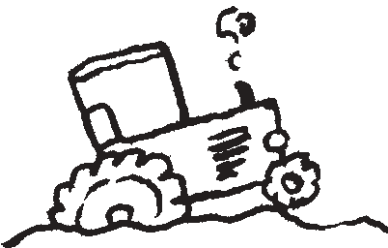
describe how the meaning of ideas can change over time, for example, ideas about equality, welfare, and democracy

Elkanah Walker's quote - page 40

Male Sockeye Make Return, Spawns Hope - page 41

## Geography

1. The student uses maps, charts, and other geographic tools to understand the spatial arrangement of people, places, resources, and environments on Earth's surface.



1.1 use and construct maps, charts, and other resources

use maps, globes, and other geographic tools including various map projections, satellite imagery, and GIS data to interpret information from a spatial perspective

Landform, Waterflow, Population, Resources-Gifts and Political Boundaries teams - page 8

use data and a variety of symbols and colors to create thematic maps and graphs, for example, patterns of population, economic features, rainfall, or vegetation

Landform, Waterflow, Population, Resources-Gifts and Political Boundaries teams - page 8

1.2 recognize spatial patterns on earth's surface and understand the processes that create these patterns

locate physical and human features and events on maps and globes, for example, the location of cultural centers, large urban areas in the U.S. now and in the past, and major land forms and climate regions

Identifying land forms on a map - page 7

2. The student understands the complex physical and human characteristics of places and regions.

2.1 describe the natural characteristics of places and regions

use observation, maps, and other tools to identify and compare the physical characteristics of places and regions such as wildlife, climate, natural hazards, and waterways

Watershed resources gifts team - pages 8, 20-22

2.2 describe the patterns humans make on places and regions

use observation, maps, and other tools to identify and compare the patterns humans make on places and regions, for example, cultural characteristics, population characteristics, and level of economic development

Man & Nature...the connection – page 34

3. The student observes and analyzes the interaction between people, the environment, and culture.

3.1 identify and examine people's interaction with and impact on the environment

analyze the different ways people use the environment, the consequences of use, and possible alternatives

Costs & Benefits of Resources – pages 20-22

explain how the actions and interactions of human societies affect and are affected by the environment

Political Boundaries – page 8

# Kit Inventory



For additional information,  
please contact:  
The Lake Roosevelt Forum  
1404 N. Thor Ct., Suite 112  
Spokane, WA 99202  
509-535-7084

ITEMS QUANTITY

**Teacher Guide** 1  
**Lake Roosevelt Area Handbook** 1

*Special Thanks:*

John Covert, Hydrologist  
Water Resources Program,  
DOE

Foundation for Water &  
Energy Education

The Lands Council

National Park Service

Northwest Power Planning  
Council

US Bureau of Reclamation

Washington Dept. of  
Ecology

**Maps:**

Satellite Map of Lake Roosevelt Region 30"x40" 1  
Lake Roosevelt Area Resources-Gifts Map 11"x17" (in T. Guide)\* 1  
Lake Roosevelt Area Watershed Maps (1 each of 10 maps)\* 10  
Rand McNally Washington State Map 1  
Lake Roosevelt National Recreation Area Map (National Park Service) 3  
Current Wildlife Habitat Types in Columbia River Basin 1  
Historic Wildlife Habitat Types in Columbia River Basin 1  
Watersheds of the Columbia Basin 1  
Columbia River - Troubled Waters 1

**Game Cards (Included in Teacher Guide):**

Watershed Weaving Game Card Set 1  
Human Environmental Interaction Card Set 1

**Videos:**

Coyote Legends 1  
Columbia River - Fountain of Life 1

**Additional Resources:**

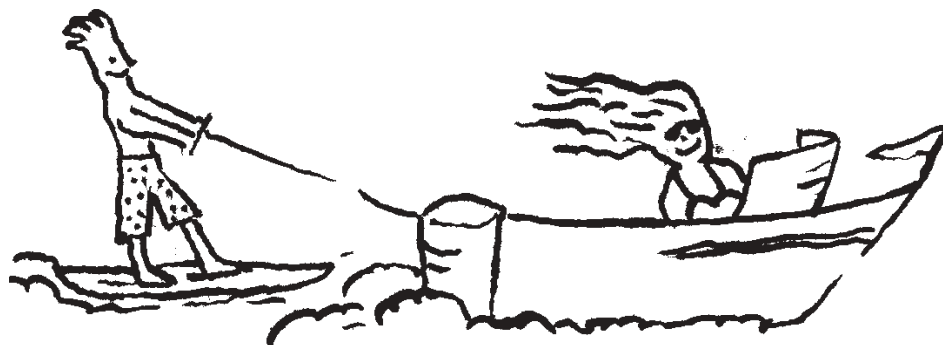
Communities by Choice Booklet 1  
Following Nature's Current 1  
Columbia Basin Fish & Water News 1

\*Map lamination recommended

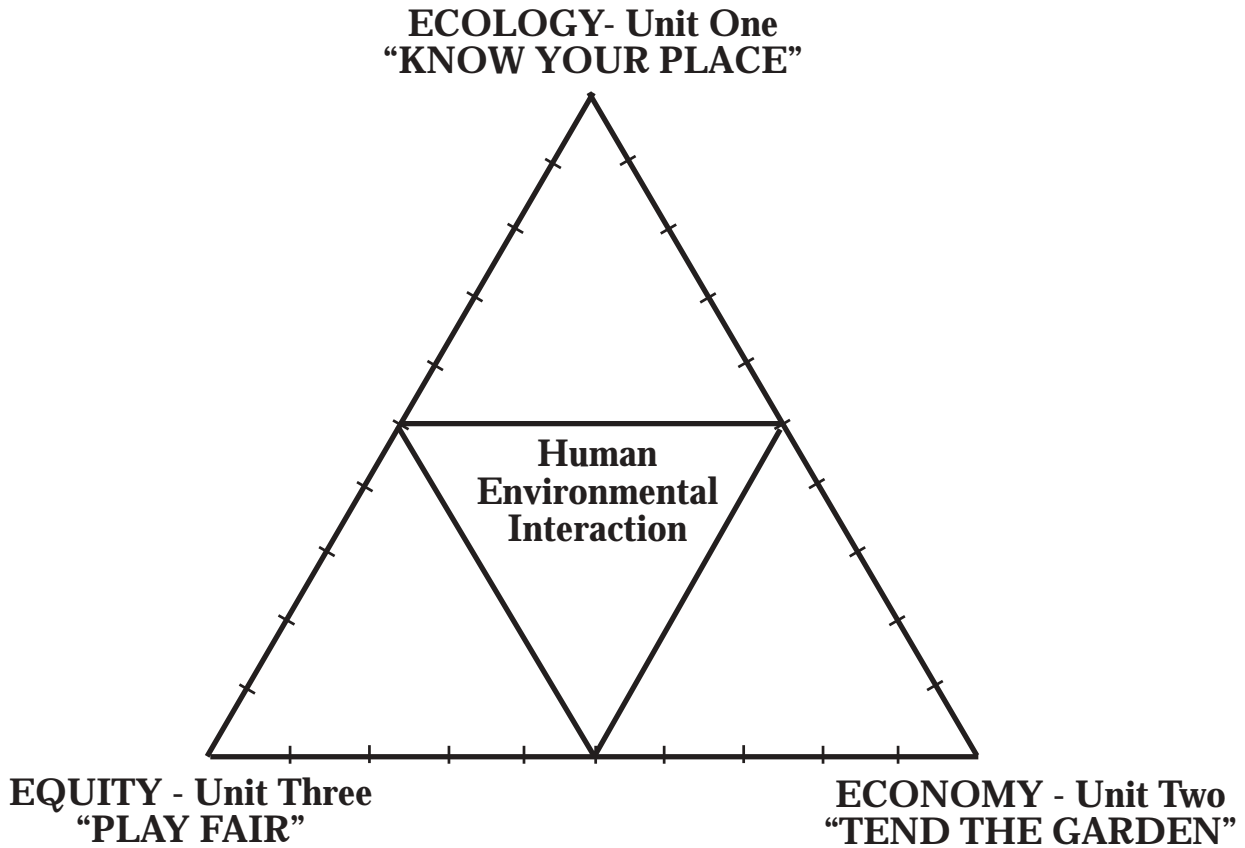
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## Balancing the Three E's of the Lake Roosevelt Watershed



Presented above are the three E's of the sustainability triangle. This model will be explored repeatedly throughout the Water Ways curriculum. Notice that when equal emphasis is placed on each ... ECOLOGY, ECONOMY and EQUITY ... the result is an inverted equilateral triangle, with each of its points touching the median location on three sides and creating an equilateral triangle for each category.

If we focus entirely on preserving the "economical" health of the watershed, without considering "ecological" costs . . . what does this do to the "equity" in our watershed? Human environmental interactions which respect the three E's produce a sustainable environment for future generations.

## Introduction

.....

**Water Ways** is a dynamic intra-disciplinary curriculum designed to give middle school students an opportunity to explore the Lake Roosevelt Watershed. Students develop an understanding of how many of their day-to-day choices can interact with and affect their local watershed. A matrix of Ecology, Economy, and Equity - the three E's of the sustainability triangle - (see model of Three E's triangle on facing page) provides a framework for students to explore and anticipate how the choices they make today can help make a better future for everyone - people and nature. Students can use this framework to discuss how 'ecological footprints' affect local economy and quality of life. A fourth dimension is added when students begin to acknowledge the impact of their choices on current and future generations.

### UNIT ONE - ECOLOGY

#### **Discovering our sense of place in our watershed.**

Students explore the "ecological footprints" of their community. Using mapping skills, students identify forms and functions, as well as, human interactions in the Lake Roosevelt Watershed.

GEOGRAPHIC THEMES: Region, Location, Place, Human Environmental Interaction, Movement

### UNIT TWO - ECONOMY

#### **Building value in our watershed community.**

In this unit students explore the concepts of renewable and non-renewable resources-gifts. Students develop a definition of cost/benefit and determine how their "communities" prioritize and value the gifts of the watershed.

GEOGRAPHIC THEMES: Region, Human Environmental Interaction, Movement

### UNIT THREE - EQUITY

#### **Honoring our relationships to life-giving water.**

Students explore how our relationships to water and the living gifts of a watershed have been respected and cherished throughout human history. Students compare and contrast poems, proverbs and quotes about our relationships to nature; create an intergenerational chart; and experience how water weaves its way through our lives.

GEOGRAPHIC THEMES: Region, Human Environmental Interaction, Movement

UNIT ONE - ECOLOGY

# What is the shape of our watershed?



**KEY WORDS:**

WATERSHED, GATHER, LANDFORMS, FUNCTIONS, ENVIRONMENT

**THEME:**

“KNOW YOUR PLACE”

**LEARNING OBJECTIVE:**

In this unit students trace the boundaries, map the geographic functions and identify some of the Human Environmental Interactions of the Lake Roosevelt watershed. Students also review the Five Themes of Geography and create a class definition for a “healthy watershed environment.”

**TEACHER NOTES:**

Understanding our relationships with the Lake Roosevelt watershed involves a close look at the effects of our actions. Just how much air, land and water does it take to support our community? How big is our “ecological footprint?” Through the consumption of natural resources and the production of waste, every community leaves an ecological footprint. An ecological footprint defined:

“Human and natural forces interacting with the environment”

The Lake Roosevelt watershed is not only our home and life-provider, as well as, the home of many plants, fungus and animals, it is at the confluence of our region’s history and geography. Closing the gates at Grand Coulee Dam in 1942 created more than a new agrarian frontier in the Columbia Basin; more than a hydropower engine for the Pacific Northwest's evolving economy; and more than a recreational mecca on a newly formed reservoir behind the dam: **it created a new watershed.** Previously divided by the region's tributaries to the Columbia River, the replacement of the free-flowing river with a lake-scape formed by human hands created a new geographic focus with new watershed boundaries -- Lake Roosevelt, with its 515 miles of shoreline and a contributing landscape of 44,969 square miles. As citizens of this special region, our watershed provides us the opportunity to explore with students the many effects our daily lives have on its ability to provide for us.

A watershed defined:

“The water flow region or area of a river, stream, etc.; a water flow”

For our purposes, a watershed refers to all of the elements and functions that interact within the geography of the watershed including, but not limited to: people, plants, trees, animals, fungus and mushrooms, insects, and a multitude of other living creatures.



**TEACHER NOTES:**

**THE FIVE THEMES OF GEOGRAPHY**

1. **Region** - Characteristics of an area such as climate, cultural traits, economic activities, natural boundaries, or landforms.
2. **Location** - Exact latitude and longitude of an area and/or its relative location.
3. **Place** - Natural and human features of an area, such as mountains and rivers or cities and towns.
4. **Human Environmental Interaction** - The way humans live with and can change their surroundings. The way people and nature live together.
5. **Movement** - How areas of the world are connected by transportation, trade and communication.

**TOOLS:**

DAY ONE

*Transparencies:*

1. Five Theme Match-Up (page 11)
2. Word Web Sample (page 12)
3. Definition: What is an ecological footprint? (page 13)
4. Definition: What is a watershed? (page 14)
5. Definition: What is the function of a watershed? (page 15)

DAY TWO

*Maps:*

1. Satellite Map of Lake Roosevelt region (30x40)
2. Rand McNally Washington State Map
3. Lake Roosevelt Area Watershed Maps (10 in all) (11x17)
4. Lake Roosevelt Area Resources-Gifts Map (11x17)

DAY THREE

*Maps:* All

*Transparencies:*

1. Definition: Ecology (page 16)
2. Watershed of the Lake Roosevelt region (page 17)



## DAY ONE LESSON: THE WATERSHED

There are three FOCUS TASKS listed below. Your class may need one, two or all three FOCUS TASKS to get up to speed with this science concept. The first deals with a review of the five themes of geography. The second helps students arrive at a working definition of a watershed environment. Thirdly, students learn the function of a watershed. Each of the FOCUS TASKS leads to class discussions.

### FOCUS TASK #1: Five Theme Match-Up

Match the Five Themes of Geography to the vocabulary words. (Transparency: Five Theme Match-up, page 11)

*Bonus:* List five of your favorite landmarks, landforms or other geographic features that come to mind when you think of the Lake Roosevelt region.

### FOCUS TASK #2: Recognizing environments that are part of the Lake Roosevelt Watershed.

Create a word web model of the Lake Roosevelt Watershed Environments using the Word Web Sample Transparency, page 12. Include student suggestions to further complete the Word Web Sample as a whole group activity. Have students copy the class word web into their journals, or issue photocopies to each student, following completion of class word web.

*Class Discussion:* Using the Overhead Transparency entitled "What is an ecological footprint?" page 13, teacher introduces information included in TEACHER NOTES, page 3. Discussion follows.

Have students find definitions for the words *watershed* and *environment*. Have them combine both definitions into one definition for "watershed environment." Students share their definitions with the class. Post definitions on the board.

*Student Activity:* Place the definition: "What is a Watershed?" up on the overhead (page 14). Have students copy definition into journals.

*Definition Transparency:* What is a watershed?

The natural boundaries, or landforms, that surround and contribute water to a river, lake, aquifer, stream, or creek.





FOCUS TASK #3: What is the function of a watershed?

*Definition Transparency:* What is the function of a watershed?

A watershed is a collection of landforms and life forms that work together to collect, hold and release water.

*Ask the students:* Does this definition tell you how a watershed works?  
(Answer: No)

**JOURNAL:**

Have students create a list of many places in the Lake Roosevelt region that match this definition and enter the list into their journals.

Make a class list of the landforms that make up a watershed.

Examples:

- |           |                   |          |
|-----------|-------------------|----------|
| Mountains | Hills             | Streams  |
| Rivers    | Basalt Formations | Wetlands |
| Lakes     | Creeks            |          |

**BRAINSTORM:**

*Metaphorically Speaking:* A metaphor is a form of comparison, where figurative language is used to describe ordinary life. Have students create examples of metaphoric language that serve to depict the “collecting”, “storing” and eventual “releasing” of water.

- Example: The lake, a giant cradle, rocks its glistening treasure gently.
- Example: My bloated tummy became a storage tank for my glutenous trips to the water fountain.
- Example: His ripe red blood flowed from the open wound, a river of over-warm jello.

**CLASS ACTIVITY:**

Refer to the Satellite Map of Lake Roosevelt region (30"x40"). Can your students identify the various landforms that are visible on the satellite map? Have students name a few of the lakes, rivers and streams they can identify as a part of their local watershed.

**DAY TWO LESSON:****THE SHAPE OF THE WATERSHED**

Gather students into five or six teams; each team receives a different set of maps (see Tools pages 7 and 8). Place the Satellite Map of the Lake Roosevelt watershed (30"x40") at the front of the class to be used as a reference, and an aid to presentations.

Using the maps included in each team's tool list, students label their map of the Lake Roosevelt watershed as directed on pages 7 and 8. Each team uses different colored post-it notes for their subject labels. After completing the team's assigned activities in a group setting, teams then affix their post-it notes on the "class map" (30"x40") in preparation to present their findings to entire class.

- 1) **LANDFORMS TEAM:** Identify and label mountain ranges, lakes, and rivers. Determine north, south, east and west on the map; create a compass rose to add to the map.

*Tools:* Rand McNally Washington State Map



- 2) **WATER FLOW TEAM:** Using the Lake Roosevelt Water Resource Inventory Area Maps: label the surrounding sub-watersheds of the Lake Roosevelt watershed. Cut out each of the 10 subwatersheds and mount in its correct location on a larger piece of tagboard (see matching Watershed Maps Key for help with locations). Color each subwatershed. Detail the direction of water flow for Lake Roosevelt. Devise a method of showing how and where rain and snow enter the Lake Roosevelt watershed. (Hydrologic Cycle/Weather)

*Tools:* Lake Roosevelt Area Watershed Maps (10 in all) 11" x17"

- 3) **POPULATION TEAM:** Affix post-it notes with the populations of each of the counties on the Satellite Map of Lake Roosevelt region (30"x40"). (See page 10 in the Lake Roosevelt Area Handbook.) Start from Grant County and work eastward into Lincoln County; northward into Okanogan, Ferry and Stevens counties; including the Colville and Spokane Indian reservations. Using the Washington State Rand McNally map and Lake Roosevelt Area Handbook, estimate the size in square miles for the Lake Roosevelt region. Then divide the square miles by population to arrive at a population density estimate.

*Tools:* Rand McNally Washington State map, Satellite Map of Lake Roosevelt region (30"x40"), Lake Roosevelt Area Handbook

*Answer Key:* See page 10 in Lake Roosevelt Area Handbook



- 4) **WATERSHED RESOURCES-GIFTS TEAM:** Identify the gifts, products or resources in the Watershed. Place post-it notes on the Satellite Map of the Lake Roosevelt region to locate where the gifts of the watershed are found, harvested, extracted, utilized, shared or cultivated.

*Tools:* Lake Roosevelt Area Resources-Gifts Map, Satellite Map of the Lake Roosevelt region (30"x40"), see FWEE web site at: [www.fwee.org](http://www.fwee.org)

Sample List:

Drinking Water	Food/Farming	Recreation
Trees/Forest	Minerals/Mining	Land/Development
People/Economic		

- 5) **POLITICAL BOUNDARIES TEAM:** Identify the various governments and agencies from the Lake Roosevelt watershed. Create a list of all of the governing bodies that might need to be contacted regarding watershed issues. Include Federal, State, County or City, and Tribal Governments.

*Tools:* Rand McNally Washington State Map

**DAY THREE LESSON: THE RELATIONSHIPS WITHIN A WATERSHED**

Study this definition of the word/concept Ecology.

*Definition Transparency:* ECOLOGY

“Ecology is the patterns of relationships between living things and their environments.” (Definition from Communities by Choice.)

**SUGGESTED CULMINATING CLASS ACTIVITIES:**

**ACTIVITY CHOICE #1: Exploring Interrelationships**

Having completed the team research and reported findings to classmates, each team that selected this Activity Choice #1 now designs an activity to show the interrelatedness of their specific team’s information with all other teams’ findings.

**Guiding question:** How important is "our team's study" in relation ship to all other team studies? Now design a poster, skit, report, song, poem, story, etc. exemplifying the interrelatedness of all team findings.

This project design is then presented to entire classroom of students and teacher(s).

.....

ACTIVITY CHOICE #2: Each team of students selecting this Activity Choice #2 will plan a public meeting (town hall format). See Lake Roosevelt Watershed, Overhead Transparency, page 17.

The Lake Roosevelt Forum, formed in the late 1980s by the citizens, community groups, government agencies and tribes that comprise the Forum have identified their mission as establishing a dialogue based on trust and respect for all views. Forum constituents seek common ways to protect and preserve the quality of the environment and enhance the quality of life as they relate to the lake and economies of the region. This is a complex constituency. The population within this watershed is decidedly rural, with about 3.2 persons per square mile. Two tribal reservations, the Colville Confederated Tribes and Spokane Indian Tribe are located here. The north side of the lake is dominated by mountains and forests with a resulting timber and mining based economy, while the south side is primarily desert plateau and farmland. From 1 to 1.5 million tourists enjoy the recreational offerings of the lake each year. The Lake Roosevelt watershed is part of a much larger Columbia River Watershed, which is about the size of France or Texas.



The key to all seemingly intractable environmental problems is adopting the appropriate time frame for remedy, and crafting strategies accordingly. While the pollution problem seems to have sprung into creation with the closing of Grand Coulee's gates, in reality the pollution has been flowing down the river for more than a century. Many of the contaminants previously loaded into the system will continue to be delivered to the lake by the region's rivers regardless of control efforts at the sources. What is needed is a long-range intergenerational transfer of environmental awareness and ethics.

Participants of the town hall meeting should keep in mind the interconnected complexity of human interaction/manipulation of the environment and the key role that individual decisions/choices play in shaping the environment. Presented as the Three E's: Ecology, Economy and Equity, community members will be offered an intellectual "viewing tool" to better understand and act on interactive complexities.

Institutionalizing environmental and public needs is a critical step in the long-range intergenerational transfer of environmental awareness and ethics. Incorporating the centuries-old traditions and awareness of the native tribes of the watershed will bring a different perspective to the "technological" orientation of Euro-American thought, and also provide a slender bridge for better mutual understanding between the two cultures that co-inhabit the region.

Team members plan a public meeting to report on the health and condition of the Lake Roosevelt watershed. Next, the team decides on the dignitaries that need to be invited to the meeting, including constituent groups.



Student Team determines where to hold their meeting and what to include on the agenda. Post a public announcement/poster to hang up in their classroom. Each team selecting this Activity Choice #2 will present their watershed update to the class, using the town meeting format. Team members select individual “roles” to play at the town meeting (i.e. dignitary, constituent, or townspeople.) Their watershed report is revealed through the debates and comments presented by each actor at the town meeting.

*Tools:* All maps, contact websites

**EXTENSION  
ACTIVITY:**

**WATER TASTE TEST**

Gather water samples from three different sources within the school in clean gallon jugs. Label each gallon with a number and keep a record (undisclosed to students) of the source.

Give each student three small paper cups, asking her/him to write the numbers from the corresponding gallon jugs on the bottoms of each paper cup, as they pour themselves a sample of water.

Have students do a taste test of the three water samples, ranking each according to taste, texture, clarity, and smell. Students create their own rating scale that goes from 1 to 5, or use the scale below. Students place a scoring (see example below) number on the side of each cup to match the tastes of the water.

Example:

TASTES REALLY GOOD	SCORE 1
TASTES GOOD	SCORE 2
HAS NO TASTE	SCORE 3
TASTES NOT SO GOOD	SCORE 4
TASTES BAD	SCORE 5

Calibrate the results of the class survey on the overhead or board, to determine the best tasting and worst tasting sources (jugs) of water, then identify the sources to students.



**WEB SITES TO CHECK OUT:**

**For some insights into the “ways of water,”  
visit The Hydrological Cycle at:  
[water.usgs.gov/public/educational.html](http://water.usgs.gov/public/educational.html)**

**See Water Ways Website at: [www.lsw.org/scd](http://www.lsw.org/scd)**

**Visit the Foundation for Water and Energy  
Education (FWEE) site at:  
[www.fwee.org](http://www.fwee.org)**

**For more information about watersheds go to:  
[www.ior.com/~swic](http://www.ior.com/~swic)**



Overhead Transparency  
**Five Theme Match-Up**

**Themes of Geography**

**REGION** - Characteristics of an area such as climate, cultural traits, economic activities, natural boundaries, or landforms.

**LOCATION** - Exact latitude and longitude of an area and/or its relative location.

**PLACE** - Natural and human features of an area, such as mountains and rivers or cities and towns.

**HUMAN ENVIRONMENTAL INTERACTION** - The way humans live with and can change their surroundings. The way people and nature live together.

**MOVEMENT**- How areas of the world are connected by transportation, trade and communication.

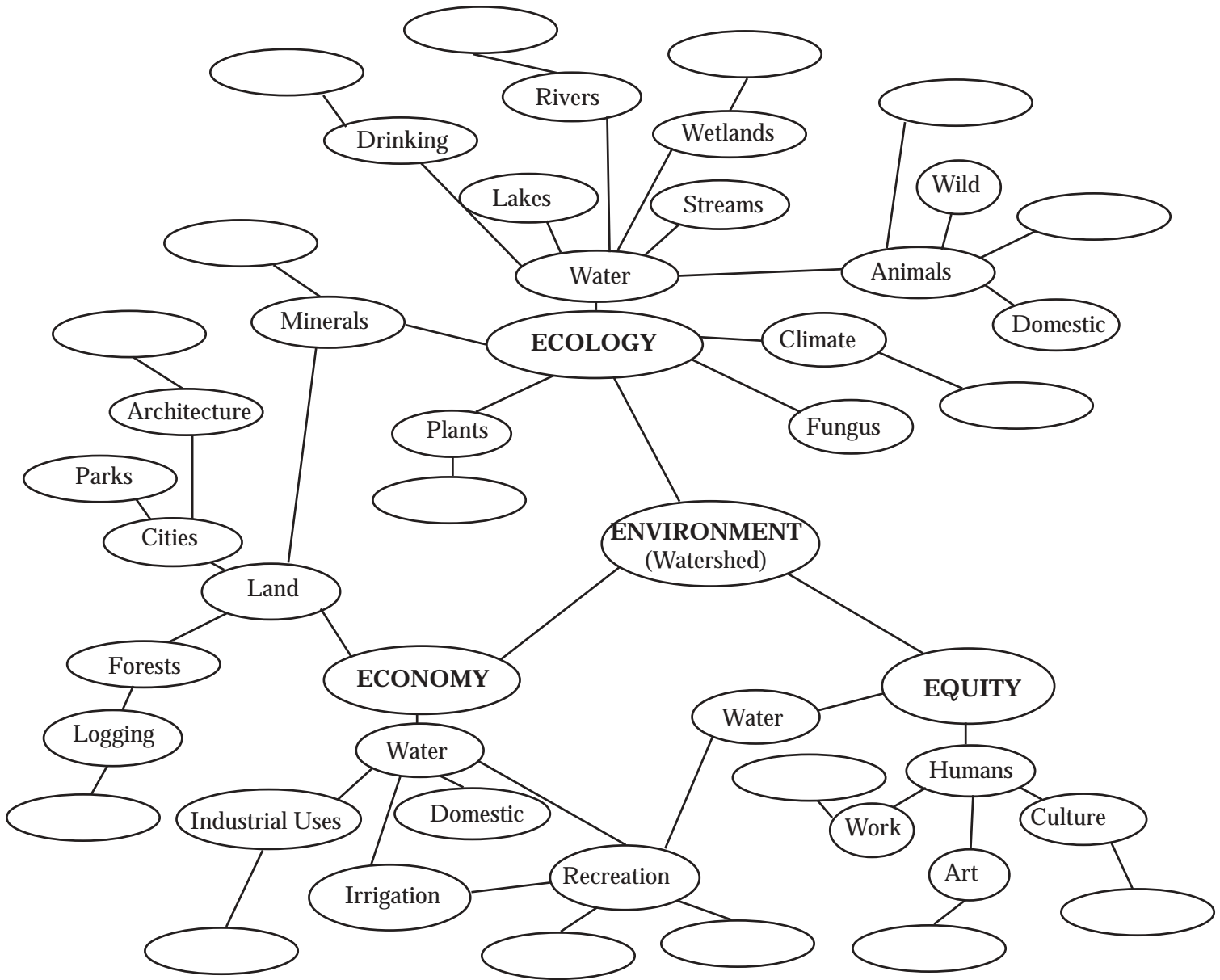
**Directions: Study the definitions for the five themes of geography above. Place the first letter of each theme next to its matching vocabulary word from the list below.**

**Vocabulary**

- |   |                       |                    |
|---|-----------------------|--------------------|
| Climate                                   | Relative location     | Communication      |
| Exact latitude and longitude of an area   | Mountains             | Natural boundaries |
| Natural and human features of an area     | Rivers                | Landforms          |
| The way humans interact with environment  | Streams               | Cities             |
| How areas of the world are interconnected | Change in environment | Towns              |
| Cultural traits                           | Interrelationships    | Watersheds         |
| Economic activities                       | Agriculture           | Wetlands           |
|   | Transportation        | Lakes              |
|   | Trade                 | Aquifers           |

# Overhead Transparency Word Web Sample

.....



**Directions: Students suggest answers to fill empty circles, adding more “words” to web as appropriate.**

Overhead Transparency

**Definition**



# What is an ecological footprint?

Human and natural forces interacting with the environment.

Overhead Transparency  
**Definition**

.....

## What is a watershed?

The natural boundaries, or landforms, that surround and contribute water to a river, lake, aquifer, stream or creek.

Overhead Transparency

**Definition**

.....

**What is the function of a watershed?**

A watershed is a collection of landforms and life forms that work together to gather, hold and release water.

Overhead Transparency  
**Definition Overhead**

.....

## What is ecology?

Ecology is the patterns of relationships between living things and their environment.

## Overhead Transparency or Hand-Out

# Lake Roosevelt Watershed

### Lake Roosevelt Watershed

Closing the gates at Grand Coulee Dam in 1942 created more than a new agrarian frontier in the Columbia Basin; more than a hydropower engine for the Pacific Northwest's evolving economy; more than a recreational mecca on a newly formed reservoir behind the dam: **it created a new watershed.** Previously divided by the region's tributaries to the Columbia River, the replacement of the free-flowing river with a lake-scape formed by human hands created a new geographic focus and new watershed boundaries -- Lake Roosevelt, with its 515 miles of shoreline and contributing landscape of 44,969 square miles.

The river's water, however, was not the only thing impounded behind the dam. Pollution from lead, zinc and silver mining in Idaho and Canada also found its resting place in the still waters and sediments of Lake Roosevelt. More than a million tons of toxic heavy metal-contaminated sediment is now estimated to line the bed of the lake, with the highest concentrations found in the Spokane Arm (the now submerged confluence of the Spokane River and the Columbia). Radioactive waste from uranium mining in Washington state; dioxin, furans and associated chlorinated hydrocarbons from a pulp mill in Canada; PCBs and mercury from industrial plants; sediment, pesticides and nutrients from agriculture; and residential development all contribute to a common focus for the inhabitants of the region: how to clean up and protect the common point of the watershed, Lake Roosevelt.

The Lake Roosevelt Forum, formed in the late 1980s by the citizens, community groups, government agencies and tribes that comprise the Forum have identified their mission as establishing a dialogue based on trust and respect for all views. They seek common ways to protect and preserve the quality of the environment and enhance the quality of life as related to the lake and economies of the region. It is a complex constituency. The population within this watershed is decidedly rural, with about 3.2 persons per square mile. Two tribal reservations, the Colville Confederated Tribes and Spokane Indian Tribe, are located here. The north side of the lake is dominated by mountains and forests with a resulting timber and mining based economy, while the south side is primarily desert plateau and farmland. From 1 to 1.5 million tourists enjoy the recreational offerings of the lake each year.

The key to all seemingly intractable environmental problems is adopting the appropriate time frame for remedy, and crafting strategies accordingly. While the pollution problem seems to have sprung into creation with the closing of Grand Coulee's gates, in reality pollution has been flowing down the river for more than a century. Many of the contaminants previously loaded into the system will continue to be delivered to the lake by the region's rivers regardless of control efforts at the sources. What is needed is a long-range intergenerational transfer of environmental awareness and ethics.

Agencies are restricted in their approach to environmental issues by the inherent short-term focus of their activities. As agencies of state or federal executive branches, agencies by necessity operate on a four year macro-scale cycle (elections) and an annual micro-scale cycle (budget). They may hope for more, but they can only provide within those restrictions. By strengthening an environmental awareness and ethics in the region's children, through the public school system, it is hoped that the momentum for restoration and protection will span the agency cycles.

Through educational programs addressing the challenges surrounding the Lake Roosevelt watershed, the predominantly Euro-American inhabitants of the watershed will gain a deeper understanding of the native tribes' relationship to the same landscape. It is appropriate and necessary that we learn from the people who have inhabited the watershed for thousands of years, the lessons the land may teach us to aid in our healing of it.

UNIT TWO - ECONOMY

# How do we value our watershed?



**KEY WORDS:**

HOLDING, STORE, ECONOMY, ACCOUNTING, COST, BENEFITS

**THEME:**

“TEND THE GARDEN”

**LEARNING OBJECTIVE:**

In this unit students explore the concepts of renewable and non-renewable resources-gifts of the watershed. Students develop an understanding of the definitions for cost and benefit, learning that these terms are the basis for our economy and the survival of our community.

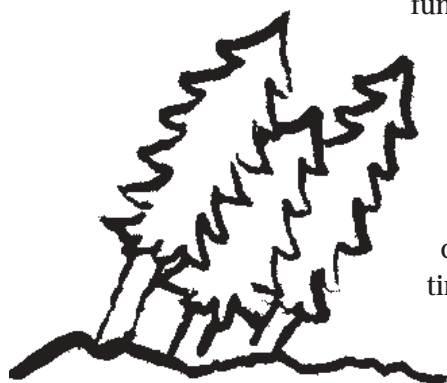
“A healthy watershed is truly an intergenerational gift.”

**TEACHER NOTES:**

In thinking about the economic resources-gifts of a watershed, consider how the watershed waters flow through different landforms and hold onto water in various life forms and landforms. Also consider how we share in the benefits of these resources-gifts as they support and nourish us. Food. Water. Shelter. Recreation. These resources-gifts are the basis for our economy and our community, each having multiple costs associated with their use.

This study approach requires a different perspective on a watershed. Watersheds have been gathering places for civilizations throughout all of history. The natural resources of the watershed have sustained many civilizations, cycling in and out of existence, in the same location, for hundreds of generations.

There are many living gifts in our watershed. Human beings are part and parcel of these living gifts. The life cycles of trees, humans, plants, animals, as well as, the timelessness of a mountain or lake are all interrelated. Understanding that natural resources-gifts are part and parcel of the systemic functions of our region helps us to understand our responses and responsibilities to the watershed.



When we approach our watershed in this manner, we recognize that trees, plants, animals (including us) and fresh, clear, pure life-giving and sustaining water are all gifts. These gifts are an intergenerational legacy for our children, our grandchildren, and the children of our grandchildren. With care these resources-gifts are timeless. Cyclical. Ever restorative. Sustainable.



Of course...for every gift there is a thank you...for every benefit...a cost. There is an old saying that “the gift must go on,” meaning that the “thanks-giving” of any gift is the giving back of a gift of equal or greater value. In this way appreciation is shown, friendships grow, and equity flourishes, whether in the backyard garden or in the community at large.

In this unit students explore the concepts of renewable and non-renewable, along with recyclable resources and gifts, while developing skill sets for dialoguing and debating how best to nurture the region, and considering the costs and benefits of different behaviors and attitudes.

**TOOLS:****DAY ONE**

*Book:* “The Giving Tree” by Shel Silverstein (not in teacher’s kit)

*Transparencies:*

1. Definition: Renewable/Non-renewable/Recyclable (page 23)
2. Definition: Economy (page 24)
3. Definition: Cost/Benefit Analysis (page 25)

**DAY TWO**

*Cards:* Human Environmental Interaction (HEI) Cards (pages 26-27)

*Hand-Outs:* One copy of each Human Environmental Interaction (HEI) Poster for each team (page 28)

**DAY ONE LESSON:****RENEWABLE and NON-RENEWABLE RESOURCES-GIFTS**

Read “The Giving Tree” by Shel Silverstein to students.

Have students record a personal reaction to the story in their journals.

Review the Three E’s (Ecology, Economy, Equity) Word Web Sample from Unit One (page 12).

*Ask the Students:* What resources-gifts come from a watershed? Which of the watershed’s gifts are renewable? Which of the watershed’s gifts are non-renewable? Recyclable?

*Display:* Place the transparency definition “Renewable/Non-renewable/Recyclable” on the overhead. Definitions:

Renewable: Resources-gifts that are produced as part of nature’s dynamic cycle of change.

Non-renewable: Non-renewable resources-gifts are those that take millions of years to create.

Recyclable: Any product, natural or human made, that can be used again, either in its present form or through restructuring.

**JOURNAL:**

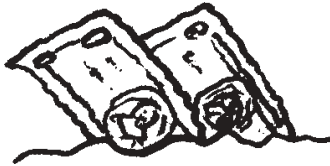
On an empty page in your journal, create three columns, with the headings Renewable, Non-Renewable and Recyclable. Returning to the word web that you previously copied into your journal, separate the resources-gifts into the three columns. (Be wise! Some of the gifts may end up in two columns.)



*Display:* Place the definition of economy on the overhead. Study the definition of the word/concept economy. Definition:

Economy is the management and use of resources-gifts to meet household and community needs.

*Ask the students:* How do we determine if our needs are being met in a balanced manner?



*Display:* Place the definition of cost/benefit analysis on the overhead.

A cost/benefit analysis is the process of comparing what you give or pay (cost) to what you receive or get (benefit).

Example:

- 1) You study two hours for a test. You receive an A. If your parents pay you by the grade, was it worth it? What is the cost and what is the benefit? Is there more than one benefit? Cost?
- 2) You lose your temper in class and spend 3 hours in detention? What is the cost? Is there a benefit?
- 3) You raise tomatoes in a green house for sale in the local market. You pay for the seed, water, heating and delivery. You sell them for less than you pay to grow them. Is there a benefit? Why or why not?

**JOURNAL:**

Ask students to create and record a personal cost/benefit scenario for their journals.

**DAY TWO LESSON:**

**RESOURCES – GIFTS of the WATERSHED**

How do we, as a community, “measure, honor, utilize and balance” the costs/benefits of our watershed’s resources-gifts?

*Note to Teacher:* This lesson contains two assessment models (see pages 30 and 31-32). Familiarization with each model prior to teaching the lesson is recommended. Use Human Environmental Interaction Score Sheet on page 30 for a general assessment; pgs. 31-32 for an in depth assessment (following more thoroughly developed/researched group presentations).

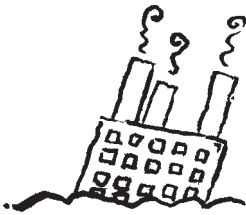
STEP 1: Gather students into groups, each representing just one of the six gifts of the watershed. Hand out an Human Environmental Interaction (HEI) card (representing a gift) with definition (pages 26-27) to each group (Example: Group One receives “Clean Water”... Group Two receives “Minerals/ Mining” ... etc.). Each group studies the HEI card they have received, discussing the “costs” and “benefits” of their assigned gift to the community. Using ideas from the discussion, each team creates an HEI poster (see page 28) which details the following information from the perspective of their resource-gift.



- 1) If I represent the resource of \_\_\_\_\_, what are the Ecological Gifts that I bring to my community?
- 2) If I represent the resource of \_\_\_\_\_, what are the Economical Gifts that I bring to my community?
- 3) If I represent the resource of \_\_\_\_\_, what are the Gifts of Equity that I bring to my community?
- 4) How can the “resource–gift” be shared so that Ecology, Economy, and Equity are maximized?

*Note to Teacher:* Example poster found on page 29.

Groups hang their posters where other student groups can see them. Group members rotate from poster to poster to study group information.



STEP 2: After reviewing the other teams’ completed HEI posters, each group decides how well the individual gifts are contributing to a better Lake Roosevelt region “for everyone” by ranking the resources–gifts from greatest to least value

(Example: 1 - Recreation, 2 - Food/Farming, etc.). This ranked listing, recorded on a 3x5 card, will represent the group’s perspective on which is the *most important gift* in the watershed, which is the *next most important* and so on down to the last gift. Groups prepare to verbally justify this ranking to full classroom.

STEP 3: Each group selects a spokesperson (who will report for group) and a gift representative (who will represent the group’s resource–gift). Gift representatives from *each* of the six groups stand at the front of classroom, holding their resource–gift name tags. Teacher distributes HEI Score Sheets (page 30–only one per class member) *OR* Persuasive Presentation Scoring Guides (pages 31-32 – each group needs five complete scoring guides). The spokesperson from each group takes h/her turn “arranging gifts” in the rank order selected by their group members (from most to least value). Spokesperson explains the reasoning behind the ranking from his/her group perspective.

**STEP 4: The Interview**

Immediately following each spokesperson’s presentation, the teacher or spokesperson polls the “gifts”, asking each gift how it “feels” to be positioned, or ranked, in this order. Responses are shared from the perspective of the “gift” itself.

*Note to Teacher:* Pause after each group presentation to allow time for the completion of the Assessment Model selected for use with this lesson (follow directions on either Scoring Guide).



STEP 5: Assessment

Prior to presenting this lesson, the teacher selects *one* of the following assessment models to provide feedback to students from peers. *If the Persuasive Presentation Scoring Guide is selected, the group’s spokesperson and gift representative should be advised to prepare more formal and detailed presentations.*

**JOURNAL:**

Upon completion of the 5-step lesson outlined above, students respond to the following questions in their journals.

- 1) In my personal opinion, the resources-gifts belong in this order:
- 2) What would I do to protect-assure that these resources-gifts are available to me, and to my children, in the future?

*Note to Teacher:* There is no right or wrong ranking order for this activity. The group is successful if their team engages in a thoughtful, meaningful consideration of the value of their assigned “gift” with regard to ECOLOGY, ECONOMY and EQUITY.

**CLASS DISCUSSION:**

OPTIONAL: At this point in the lesson, teacher may wish to lead “all” students to “agree” upon a final rank order of “the gifts.” Additionally, this lesson could become a lead in to a variety of whole class or group projects/ debates surrounding the protection of our watershed.

**WEB SITES TO CHECK OUT:**  
**Have students visit the following site to discover more about water use patterns of the United States:**  
[water.usgs.gov/watuse](http://water.usgs.gov/watuse)

**See Water Ways Website at:**  
[www.lsw.org/scd](http://www.lsw.org/scd)

Overhead Transparency  
**Definition**



**Renewable:**

Resources-gifts that are produced as part of nature’s dynamic cycle of change. These can be weather related, like solar, wind, and wave power, or water power with the help of gravity. Weather also affects seasonal growing patterns which are responsible for renewable crops, for food and fiber and includes trees. Earth changes such as plate tectonics produce geothermal heat which is also renewable.

**Non-Renewable:**

Non-renewable resources-gifts are those that take millions of years to create. Examples of these would be precious metals such as gold and silver, minerals, coal, oil, natural gas and nuclear energy.

**Recyclable:**

Any product, natural or human made, that can be used again, either in its present form or through restructuring.

Overhead Transparency  
**Definition**

---

**Economy:**  
The management and use  
of resources-gifts to meet  
household and community  
needs.

Overhead Transparency

**Definition**

.....

**Cost/Benefit Analysis:**

The process of comparing what you give (the cost) with what you receive (the benefit).

Overhead Transparency or Hand-Out  
**Human Environmental Interaction Cards**

.....  
Directions: Copy onto cardstock, cut into individual cards, distribute one card to each student team

# LAND DEVELOPMENT

the process of making natural regions available and usable to the community

# FOOD/FARMING

setting aside a tract of land on which crops or animals are raised to provide nourishment for humans, etc.

# MINERALS/ MINING

the excavation of ore and other minerals for use in industry and household consumption

Overhead Transparency or Hand-Out

## Human Environmental Interaction Cards

.....

# RECREATION

involvement in activities that amuse  
or refresh one's mind or body

# TREE/FOREST

a dense growth of trees, plants and underbrush  
covering a large area of land;  
home to ecological communities

# CLEAN WATER

a clear, colorless, odorless, and tasteless liquid,  
H<sub>2</sub>O, essential for most plant and animal life

# Human Environmental Interaction Poster

.....

**Directions:** Following your group’s discussion of the HEI card assigned, list the “gifts” that your particular resource provides in the appropriate columns below.

*Note: Remember to speak from your "gift's perspective" while completing this assignment.*

RESOURCE-GIFT	ECOLOGY	ECONOMY	EQUITY
<p><i>If I represent the resource of _____,</i></p> <p><i>what are the gifts I bring to my community?</i></p> <p><i>How can the “resource-gift” be shared so that Ecology, Economy, and Equity are maximized?</i></p>			

Teacher Example

**Human Environmental Interaction Poster**



**Directions:** Following your group’s discussion of the HEI card assigned, list the “gifts” that your particular resource provides in the appropriate columns below.

*Note: Remember to speak from your "gift's perspective" while completing this assignment.*

RESOURCE-GIFT	ECOLOGY	ECONOMY	EQUITY
<p><i>If I represent the resource of <u>CLEAN WATER</u>, what are the gifts I bring to my community?</i></p> <p><i>How can the “resource-gift” be shared so that Ecology, Economy, and Equity are maximized?</i></p>	<p>I provide water to humans for drinking, bathing, watering plants, and recreating.</p> <p>I provide habitats for fish, birds, and forest animals.</p> <p>I offer esthetic beauty for all to enjoy.</p>	<p>I pass through dams to provide hydroelectric power to millions of families.</p> <p>I am the main source of attraction/recreation for boaters, fishermen, swimmers, sunbathers, etc. These activities all provide for manufactured goods.</p> <p>Many manufacturers use me in the “bottled water” frenzy of today’s culture.</p>	<p>Clean water is essential for the continuation of all life forms.</p> <p>Economically, I must remain pure if I am to satisfy the purchaser of my resource.</p> <p>Ecologically, when I am pure, I will please the pleasure seeker, as well as the environmentalist. Everyone wins!</p>

**EXAMPLE**

# Human Environmental Interaction Score Sheet

**Directions:** Observe carefully each group’s rank ordering of the “gifts”. Listen to all justifications for the ranking offered by any group member. Then check “very much”, “sort of” or “not much” to score each group’s ranking with respect to the Ecology, Economy and Equity of the community.

*Upon completion of this form, carefully separate the scored boxes and distribute to each group for feedback.*

VERY MUCH  
SORT OF  
NOT MUCH

<b>TEAM #1</b>	Do you think this arrangement is Ecological? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Economical? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Equitable? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>TEAM #2</b>	Do you think this arrangement is Ecological? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Economical? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Equitable? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>TEAM #3</b>	Do you think this arrangement is Ecological? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Economical? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Equitable? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>TEAM #4</b>	Do you think this arrangement is Ecological? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Economical? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Equitable? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>TEAM #5</b>	Do you think this arrangement is Ecological? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Economical? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Equitable? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>TEAM #6</b>	Do you think this arrangement is Ecological? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Economical? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do you think this arrangement is Equitable? <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

# Group Evaluation

## Persuasive Presentation Scoring Guide Area of concentration: Providing Feedback

**Directions: Following each spokesperson’s (group’s) presentation, each audience group assembles to score the presentation as a means of providing constructive feedback (5-10 minutes).**

### 5 Point Presentation

- |  | YES                      | SORT OF                  | NO                       |
|--|--------------------------|--------------------------|--------------------------|
| Did the presentation have personality? Was the spokesperson and/or gift representative enthusiastic about his/her topic? Did the spokesperson utilize unique presentation techniques that made you “want to listen?” | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did the spokesperson convey the beliefs of her/his group with conviction...even if s/he wasn’t sure if other students would agree?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did you feel as though the presenters were talking directly to you...“willing” you to listen carefully and to consider their points of view?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was the presentation well prepared? Did the spokesperson launch the presentation in a timely manner, stay on topic throughout presentation, and appear confident?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did the presentation hold your attention? Did you feel drawn into the topic; even beginning to be “persuaded” by the statements/opinions delivered?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**IF YOU ANSWERED YES TO ALL OR MOST OF THESE QUESTIONS, IT WAS A 5 POINT PRESENTATION. IF NOT, READ THE FOLLOWING:**

### 3 Point Presentation

- |   | YES                      | SORT OF                  | NO                       |
|---|--------------------------|--------------------------|--------------------------|
| Did the spokesperson and/or gift representative seem sincere, though less than lively or energetic about his/her topic? Did you find your mind wandering, for lack of enthusiasm toward the presentation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did the presenters talk “around” the topic... not appearing to convey true conviction surrounding their group’s ranking of the resources-gifts?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did the presenters offer a few persuasive points, and then ramble off into generalized comments too frequently?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did the presentation lack organization? Was time wasted setting up the ranking of gifts...or shuffling through note cards during the presentation?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was it somewhat difficult for you to remain attentive throughout presentation? Did you find yourself dismissing the statements/comments presented, because they appeared to lack merit?                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**IF YOU ANSWERED YES TO ALL OR MOST OF THESE QUESTIONS, IT WAS A 3 POINT PRESENTATION. IF NOT, READ THE QUESTIONS ON THE BACK OF THIS PAGE.**

# Group Evaluation

## Persuasive Presentation Scoring Guide Area of concentration: Providing Feedback

**Directions: Following each spokesperson’s (group’s) presentation, each audience group assembles to score the presentation as a means of providing constructive feedback (5-10 minutes).**

### 1 Point Presentation

	YES	SORT OF	NO
Did the spokesperson and/or gift representative lack enthusiasm for his/her topic? Did you feel as though the spokesperson was uncomfortable with h/her presentation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the spokesperson or gift representative seem to be simply “relaying the opinions of others”, lacking personal conviction for the topic?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did you sense that the group, and its spokesperson, had not reached a consensus regarding the ranking of gifts... almost as if they did not understand, or care about, the presentation assignment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was it difficult to follow the presentation? Did the spokesperson’s presentation appear to lack organization? Were there gaps, forcing you to “wait” while the spokesperson gathered his/her thoughts or asked other group members for help?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the spokesperson or pawn appear uncomfortable with the topic and/or presentation? Were you unable to feel interested in or drawn toward the topic as presented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IF YOU ANSWERED YES TO ALL OR MOST OF THESE QUESTIONS, IT WAS A 1 POINT PRESENTATION.

UNIT THREE - EQUITY

# What are our relationships to this watershed?



**KEY WORDS:**

RELEASE, SHARING, EQUITY

**THEME:**

“PLAY FAIR”

**LEARNING OBJECTIVE:**

Students learn the importance of water--to the survival of people, and of people--to the survival of usable water. Through several activities, students become even more aware of the web of connecting systems that function to gather, to hold, and to release life to its citizens.

“When we try to pick out anything by itself, we find that it is bound by a thousand invisible cords...to everything in the universe.”

*Naturalist John Muir*

**TEACHER NOTES:**

In the process of identifying our relationships to water, we are confounded by our inability to separate ourselves from water. Wherever we turn, we are part of the community of water and watersheds. In every community there is a web of connecting systems that functions to gather, hold and give life to its citizens. Our community is like a watershed, and the relationships that make up the community model the interdependency of the resources-gifts of a watershed. A healthy, thriving watershed is a balancing act where the forces of nature are constantly changing and creating opportunity for life to happen.

“If you take one tree, plant two. If you need one bushel of wheat, plant two.” This behavior builds community. In action, it mirrors a fundamental behavior of life. Give and take. Be fair. Balance what you take with what you give.

In this unit, students explore how communities of the past and present have honored and revered the living gifts and waters of the watershed. Students discover how the resources-gifts of the watershed are connected to water.

**TOOLS:**

DAY ONE

*Transparencies:*

1. Definition: Equity (page 38)
2. Quotes of many people, many nations (page 44)
3. Quotes and the Word Web (page 39)

*Handouts:*

Quotes of many people, many nations (page 42-43)

DAY TWO

*Transparencies/Article:*

1. Quote from Elkanah Walker (page 40)
2. Male Sockeye Make Return, Spawns Hope (page 41)



**DAY ONE LESSON:** MAN and NATURE... THE CONNECTION

Place the transparency titled “Quotes of many people, many nations” (page 44) on the overhead projector. Mention that man has been “connected” with nature since the beginning of time. Begin with a class discussion surrounding the meaning of one or more quotes.

Distribute lists of “Quotes from many people, many nations” (page 42-43) to students. Have the students find a quote that “speaks” to a word listed on the Word Web from Unit One (see word web copied into their student journals from Overhead Transparency Word Web Sample, page 12). Match the quotes with the subject words on the Word Web. There may be more than one quote for some subjects, there may be none for others. Use all of the quotes. Make a note of which subjects have no quotes. Who/what has no voice? (This activity can be completed by individual students, small groups, or entire class, using the format illustrated below (see Quotes and the Word Web, Overhead Transparency pg. 39).

# of QUOTE	SUBJECT FROM WORD WEB it speaks for/about	Country or continent	Date (?)
3	Ecology	Japan	13th century

**JOURNAL:**

Place the transparency on EQUITY (page 38) on the overhead projector. After a short discussion, ask students to place this definition or a similar one in their journal. Students select one or more subject words from the Unit One Word Web for which there is *no matching quote*. Create a quote to match with the subject word you have chosen. Record in your journal.



**DAY TWO LESSON:** WHERE ARE THE SALMON?

Place the quote from Elkanah Walker’s description of the salmon runs (page 40) on the overhead projector. Hand out the Male Sockeye Make Return, Spawns Hope article (page 41). Compare and contrast the Male Sockeye article with Elkanah Walker’s description of the river. *Ask the students:* What has changed?

First, have the students calculate how many years have passed between the time of Elkanah Walker’s quote and the Male Sockeye returned to the Sawtooth Fish Hatchery (Answer: 160 years).



*Formula for determining generations:* A generation is defined by Webster as: The term of years, roughly 30 among human beings, accepted as the average period between the birth of parents and the birth of their offspring. Therefore, if you divide the number of years given by 30, you can determine how many generations are possible.

$$\text{TOTAL YEARS} \div 30 \text{ YEARS} = \# \text{ of GENERATIONS}$$

*Ask the students:*

- 1) How many generations have passed since Elkanah Walker said, “It is astonishing the number of salmon which ascend the Columbia yearly...”
- 2) What do you think will happen to the salmon runs in the next 6-7 generations? Why?
- 3) Is there any way to stop the decrease in salmon?
- 4) What could your generation do to end the decrease in salmon numbers in the Northwest?

**JOURNAL:**

Next, have the students create an Imaginary Future Generations List. Ask students to place themselves at the head (top) of an imaginary family tree. Chart the family tree, including all family members: creating the timeline as though you can foresee future generations of relatives. Have the chart progress for five generations.

*Ask the students:* How many people are in your family after five generations?



**DAY THREE  
CULMINATING  
ACTIVITIES:**

**WHERE ARE WE GOING FROM HERE?**

Teacher and/or students may select one or more of the following Culminating Activities for their final project on the Water Ways curriculum.

**CHOICE #1:** Students select a relative from the fifth generation of their family tree (created in Day Two Lesson, page 35). Using our three main themes of Ecology, Economy and Equity... compose a letter to this imaginary relative describing the conditions of our environment today. Include personal comments telling the relative about your concerns. What does the term **ECOLOGY** mean to your relative in the year 2150? Is human **ECONOMY** still dependent upon natural “ecological” resources-gifts? Have humans and nature found a way to live in harmony, with a high regard for **EQUITY**, in all of their decisions and behaviors? In a return letter, the imaginary relative describes the conditions of the natural environment during h/her life cycle, and comments about the changes, with respect to the natural environment, reported in your initial letter.

*Note to Student:* Your correspondence may take the form of a few paragraphs, poem, short story, song or (?). Be sure to enter copies of this two-way correspondence in your journal.



**CHOICE #2:** Students may choose to complete a current events project on the decline of salmon in the Pacific Northwest. Using newspaper and/or internet research articles, students or groups may study the facts about salmon today and yesterday. Students should make their own decisions about the reasons for declines in the number of salmon – based upon “several” research sources. Design an oral or written report, poster, mural, skit or play, or (?) for presentation to the class. *Note:* Remind students to keep a record of sources for future reference, as needed.

**CHOICE #3:** In the Water Ways curriculum, the author has focused on the concepts of **ECOLOGY**, **ECONOMY** and **EQUITY**. You have studied these definitions with your classmates, and completed activities surrounding these concepts. As your classroom ends its study of Water Ways, it is hoped that you have grasped the value of a balanced world...Ecology, Economy, and Equity...all important terms. Each concept must be considered equally, if nature and humankind are to coinhabit Mother Earth in harmony.

As a student, how can you carry this knowledge into your future, remember the three E’s correctly, and utilize your new learning for the sake of all? The author of this curriculum remembers the three E’s in this manner:

- ECOLOGY...“KNOW YOUR PLACE”
- ECONOMY...“TEND THE GARDEN”
- EQUITY...“PLAY FAIR”



How will *you* remember these terms? What phrases can you use to help remember the three E's and their importance? Create a poster for your classroom that features the three E's, your own matching phrases, and a symbol or drawing to exemplify each. *Note.* You may want to gather information before making your final decisions for your poster by asking classmates how they remember the three E's.

FINAL WHOLE CLASS ACTIVITY: Pass around a hat or box and have the students take one Watershed Weaving Game Card (pages 45-53). There are 26 Watershed Cards which include three each of the following: Water, Living; and one each of the following: Rivers, Soil, Earth, Land, Living, Farming, Energy, Playing, Metals & Minerals, Sheltering, Timber & Fiber, People, Wildlife, Fish, Birds, Trees, Plants, Erosion, Pollution, Floods.

Each student randomly picks a Watershed Gift Card from the pile. The students, while standing in a circle, each tell what gift they represent, while holding the card in front of them for other classmates to see. Each student is then instructed to *silently* choose two other Watershed Gifts (people) that their Gift seems closely related to. The students are then asked to move slowly and silently to a point equidistant from the two gifts with which they feel related. Allow three minutes for the dynamics of the system to approach equilibrium (never actually achieved). Ask students to freeze in position and observe the "order" of the group. Ask each student to point to the two Gifts they are related to. Play three rounds of this game to find a pattern to the "order" of the group (if apparent).

**JOURNAL:**

Each student is then asked to write a journal entry on:

1. Which two Gifts did my Gift relate to most closely? Why?
2. Did you observe any patterns in how the Watershed Gift system behaved? If so, what pattern(s) did you notice?



**WEB SITES TO CHECK OUT:**

**Visit the website of the PEACEKEEPERS:  
[earthway.net/treeofpeace](http://earthway.net/treeofpeace)**

**At this site, students can explore Thomas Jefferson's connection to the Iroquois Confederacy and learn how this two thousand-year-old document influenced the formation of our Declaration of Independence and Bill of Rights!**

**Check out the Water Ways Website:  
[www.lsw.org/scd](http://www.lsw.org/scd)**



Overhead Transparency

**Definition**

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**Equity:**

The quality of being fair or impartial.

Equity is about treating all life  
with fairness and dignity.



# Transparency/Article



## Transparency/Article

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### Male Sockeye Make Return, Spawns Hope

The second adult male sockeye salmon has made it to the Sawtooth Fish Hatchery in the Stanley Basin, four days after the first one arrived.

Monday's fish, like the first one, is 18 inches long, 3 years old and the product of Idaho's captive sockeye brood stock program.

It is also a jack, a fish that spent just one year in the ocean.

Like the high number of chinook salmon jacks returning to the Snake River this year, the presence of the sockeye could indicate next year will be better.

"We're optimistic about further returns this year and more returns next year," said Paul Kline, a fisheries biologist for the Idaho Department of Fish and Game who heads the sockeye program.

But Kline was not optimistic about this year's run until fish started trickling into the Snake River system in July.

In 1997, fewer than 1,000 sockeye smolts left the Stanley Basin. And last year only two sockeye were counted at Lower Granite Dam downstream from Clarkston, Washington. Just one made it back to the Sawtooth Hatchery.

Sockeye generally spend two years in the ocean before returning to spawn and die. But for unknown reasons, some of the fish that migrated to the ocean in 1998 are making an early return this year.

The Spokesman Review, Spokane, WA, August 18, 1999.

## Quotes of many people, many nations

1. Land is a community, its waters, soils, plants and animals all fit together not for our sake but for their own. *Aldo Leopold (1960), United States*
2. To rest under a willow tree, bathed in the cool evening breeze, and watch the moon rising above the trees, is sufficient to drive away selfish desires, and uplift every thought.  
*Kaibara Ekken (1630-1714), Teacher, writer and philosopher, Japan*
3. The ocean speaks and mountains have tongues – that is the everyday speech of Buddha . . . If you can speak and hear such words you will be one who truly comprehends the entire universe.  
*Dogen Kigen (13<sup>th</sup> century), Zen master and thinker, Japan*
4. When we are the Children of the Forest, what need have we to be afraid of it? We are only afraid of that which is outside the forest. *A pygmy of the Belgian Congo, Zaire*
5. Make the universe your companion, always bearing in mind the true nature of all creation – mountains and rivers, trees and grasses, and humanity.  
*Matsuo Basho (1644-1694), haiku poet and pilgrim, Japan*
6. You can't step twice into the same river.  
*Heraclitus (513 B.C.), Greece*
7. All you under the heaven! Regard heaven as your father, earth as your mother, and all things as your brothers and sisters.  
*Shinto, Oracle of Atsuta, Japan*
8. Nature is always wise in every part. *Edward Second Baron Thurlow (1781-1829), United Kingdom*
9. The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings. An agriculture joining animals, crops, and human beings into one body existed as the mainstream of Japanese farming up to modern times.  
*Masanobu Fukuoka, Visionary, farmer and poet, Japan*
10. Our story is in the land . . . It is written in those sacred places, that's the law. Dreaming place... you can't change it. No matter who you are. No matter you rich man, no matter you king. You can't change it . . . Rock stays Earth stays I die and put my bones in cave or earth...Soon my bones become earth . . . All the same My spirit has gone back to my country . . . My mother.  
*Big Bill Neidjie, Bunitj elder, Australia*
11. I will sing the praises of this exalted peak as long as I have breath.  
*Akahito Yambe, 8<sup>th</sup> century poet, expressing reverence for Mount Fuji, Japan*
12. Yes, the young sparrows if you treat them tenderly thank you with droppings.  
*Issa Kobayashi (1763-1828) haiku poet, Japan*
13. There is craft in this smallest insect, with strands of web spinning out his thoughts; In his tiny body finding rest, and with the wind lightly turning. Before the eaves he stakes out his broad earth; For a moment on the fence top lives through his life. When you know that all beings are even thus, you will know what creation is made of.  
*Sugaware No Michizane (845-903) "The Spider", Japan*

## Quotes of many people, many nations

14. We are born from the womb of our mother; we are buried in the womb of the earth.  
*Ethiopian proverb*
15. Whenever a person breaks a stick in the forest, let him consider what it would feel like, if it were himself that was thus broken.  
*Nigerian proverb*
16. The Forest is Good.  
*Makubasi, Pygmy father; rocking his infant son, singing his praises to his beloved forest home, Africa*
17. Trees and plants bring the magnificence of heaven to the human spirit.  
*Tachibanano Toshitsuna (11<sup>th</sup> century), Author of the bible of Japanese gardening, Sakuteiki*
18. The earth is mother of all.  
*Ugandan proverb, Central East Africa*
19. The Mother told us to look after all mountains. They are ceremonial houses. We know that all the mountains we see are alive  
*Mama Bernardo, Kogi woman, South America*
20. As I get older, I burrow more and more into the hills. The Great Spirit made them for us, for me. I want to blend with them, shrink into them, and finally disappear in them. . . . All of nature is in us, all of us is in nature. That is as it should be.  
*Pete Catches, Sioux medicine man*
21. Every society needs . . . sacred places. They help to instill a sense of social cohesion in the people and remind them of the passage of the generations that have brought them to the present. A society that cannot remember its past and honor it is in peril of losing its soul.  
*Vine Deloria, Jr., standing Rock Sioux, scholar, writer and professor of law*
22. I frequently tramped eight or ten miles though the deepest snow to keep an appointment with a beech tree, or a yellow birch, or an old acquaintance among the pines.  
*Thoreau (1817-1862) Winter Visitors, United States*
23. Gie me ae spark o' nature's fire that's a' the learning I desire.  
*Robert Burns (1759-1796), Scotland*
24. I feel it with my body, with my book. Feeling all these trees, all this country . . . When this wind blow you can feel it. Same for country . . . You feel it, You can look, but feeling . . that make you.  
*Big Bill Neidjie, Bunitj elder, Australia*
25. I was enchanted - overwhelmed - with the beauty and the grandeur of everything I saw. It lay just as nature had made it, with nothing to mar its virgin beauty. I determined that I would possess it.  
*James N. Glover, Spokane, WA, May 11, 1873*
26. . . . the Japanese mind is so attached to the earth that it would not forget, however mean they may be, the grasses growing under the feet.  
*Daisetz Suzuki, Zen Buddhist scholar, Japan*

Overhead Transparency

**Quotes of many people, many nations**

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5 Make the universe your companion, always bearing in mind the true nature of all creation – mountains and rivers, trees and grasses, and humanity.

*Matsuo Basho (1644-1694),  
haiku poet and pilgrim, Japan*

21 Every society needs . . . sacred places. They help to instill a sense of social cohesion in the people and remind them of the passage of the generations that have brought them to the present. A society that cannot remember its past and honor it is in peril of losing its soul.

*- Vine Deloria, Jr., standing Rock Sioux,  
scholar, writer and professor of law*

18 The earth is mother of all.

*- Ugandan proverb , Central East Africa*

# Watershed Weaving Game Cards

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**LIVING**

**LIVING**

**LIVING**

# Watershed Weaving Game Cards

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**RIVERS**

**SOIL**

**EARTH**

# Watershed Weaving Game Cards

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**LAND**

**LIVING**

**FARMING**

## Watershed Weaving Game Cards

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**ENERGY**

**PLAYING**

**METALS &  
MINERALS**

**Watershed Weaving Game Cards**

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**SHELTERING**

**TIMBER &  
FIBER**

**PEOPLE**

# Watershed Weaving Game Cards



**WILDLIFE**

**FISH**

**BIRDS**

# Watershed Weaving Game Cards



**TREES**

**PLANTS**

**EROSION**

# Watershed Weaving Game Cards



**WATER**

**WATER**

**WATER**

## Watershed Weaving Game Cards

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**POLLUTION**

**FLOODS**