RIVER OF WORDS

National Environmental Poetry & Poster Contest for Students

TEACHER'S GUIDE

"OH BEAUTIFUL FOR SPACIOUS SKIES," the song goes, "for amber waves of grain, for purple mountains' majesty across the fruited plain." In the future they are going to say of us that, at the end of the twentieth century, we inherited a vast and beautiful and living land, still full of wild mountains and rivers, the remains of great forests, windy desert mesas, bayous and glades and lakes, and a teeming creaturely life, all this endangered and some of it rendered immensely productive by our energy and cleverness and ingenious technologies, and they are going to ask what we did with it.

They might come to say that we respected it. That we were a country from the beginning that took its character from our relationship to the immensity and beauty and promise of the land and that, though we exploited it brilliantly, sometimes mercilessly, and often unwisely, we also loved it and that in end we preserved it and cared for it. That we understood that we were in a relationship of community to the land itself, its watersheds and grasses and trees and elegant quick-eyed life, and that we passed it on, still thriving, to our children.

Or they will say of us that we were clever, energetic, and greedy. That we kept saying how much we loved the land and that we were going to respect it, but we also kept saying that it made good sense to exploit it just a little more before we stop. And we kept cutting down our forests and polluting our rivers and fouling our air just a little more, just a little at a time, until there was not much left.

How is this story going to turn out? The answer to that question lies with our children—the first generation of the twenty-first century. It lies in their own imagination of the land, in their understanding of it and knowledge of it and their feeling for the wild life around them. The idea of *River of Words* is to ask them to educate themselves about the place where they live and to unleash their imaginations. We need both things—a living knowledge of the land and a live imagination of it and our place in it—if we are going to preserve it. Good science and a vital art and, in the long run, wisdom. All this must begin in the classroom, in family conversation, and in family outings. There is no reason we cannot give our kids hope, and a sense of pride, and a love of our amazing earth, and a sense of purpose, and we need to begin now. *River of Words* is the seed of a place to start. Please join us in this effort.

To you students, I would say this: learning your watershed should be an adventure and so should expressing it in poems and art. I hope you'll bring all of your natural energy and imagination to it. It doesn't matter whether you live in the city or the country; water runs through it that supports your life. Your imaginations run through the place where you live like the water does. So I wish you watery minds and earthy minds and airy minds—and fiery minds, and all of us involved with *River of Words* hope you have fun with this project.

Robert Hass

Robert Hass
United States Poet Laureate

RIVER OF WORDS

TEACHER'S GUIDE

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River of Words is presented by International Rivers Network,
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The 1996 *River of Words* Contest is one of several events that comprise *Watershed: Writers, Nature & Community*,
a national series of events celebrating community values, the American literary imagination, and its connection to the natural world.

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International Rivers Network
River of Words Project

WELCOME to the *River of Words Teacher's Guide.*

We hope to provide you with information and ideas to inspire you to bring the wonder of nature into the classroom. By helping your students connect to their environment, you can help them connect to an essential part of themselves. The poems and posters they create as a result of this connection will help them understand their own vital place in the natural community. We hope this connection will inspire life-long stewardship and creativity.

In recent years, American educators have begun moving toward interdisciplinary curriculum, incorporating lessons from disciplines that heretofore were considered distinct. This approach broadens the educational experience for both teachers and students. *River of Words* is pleased to present a *Teacher's Guide* combining information from the sciences and from arts and letters.

How to Use This Guide

This *Teacher's Guide* is divided into three main teaching sections:

- *The Stories in the Land* Program Classroom & Field Activities
- About Watersheds
- Teaching Poetry and Art

We suggest you read through the information from The Orion Society's *Stories in the Land* Program first. The program uses an innovative approach to environmental education developed by John Elder, PhD. The introduction on page 8 will give you an understanding of the principles upon which the program is based. There is no need to follow any example exactly; the lessons work best if you allow your own environment and ideas to become a part of the process.

If you are new to teaching the natural sciences, *Stream Scene* by the Oregon Fish and Wildlife Department on page 15, will give you a good introduction to watershed ecology. The Resources and Bibliography section on page 32 contains a wealth of sources to further your own understanding, and that of your students. But even without an extensive grounding in the natural history of your own area, you and your students can discover the geography of your own place by following the steps in "Finding Your Own Bioregion," on page 22.

If you have never led a creative work session, take heart, and read through the tips and information from teachers in the Teachers & Writers Collaborative, beginning on page 25. Continue on to read Hannah Hinchman's section on teaching art to students on page 31.

Preparing students for the *River of Words* Contest does not need to be elaborate, nor do you need special skills, equipment, or resources. You can easily use the resources available in your own classroom and school yard. For brief poetry lessons on watersheds and the local natural environment, a reading of two or three example student poems, followed by a group discussion trying to guess exactly what the student-poet was seeing, hearing, etc., sets a mood of observation and attention, both to words and nature. Students could look out the window at the weather, open the windows and smell the fresh air, remember and share a recent experience of a rain or snow storm, think about where the water from those storms went. A walk out in the school yard is a field trip to the local sky, air, and geography. Puddles are useful laboratories.

We suggest that you use this cross-disciplinary curriculum as a way to reach out into your own community. Contact a local nature or environmental education group to find an expert who could lead a field trip or present a classroom demonstration. Or call a local arts education group and bring a working poet or artist into the classroom to help inspire your students. You can download an extensive list of community resources for your state from our world-wide web site. If you don't have access to the web, give us a call. Helping you branch out into your own community is part of what the *River of Words* Project is all about.

We think you and your students will enjoy preparing for the 1996 *River of Words* contest. But we planned the program with an eye on the future. This *Teacher's Guide* is our gift to you. We hope you will continue to use it as the seasons unfold.

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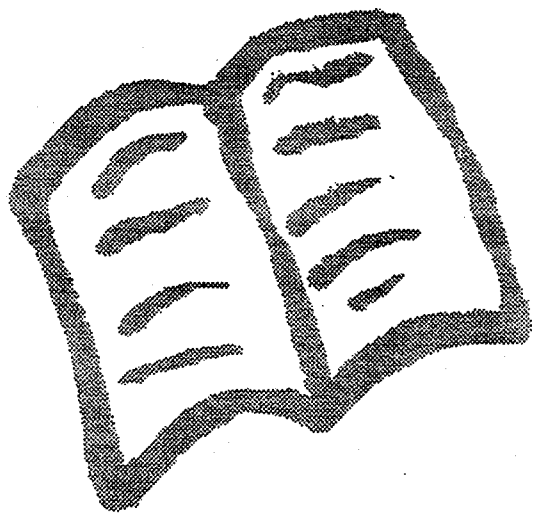
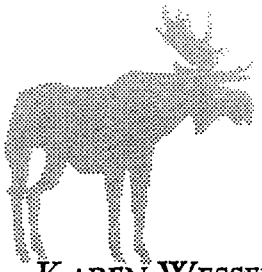
The Orion Society's *Stories in the Land* Program

For each home ground we need new maps, living maps,
stories and poems, photographs and paintings, essays and songs.
We need to know where we are so that we may
dwell in our place with a full heart.

–Scott Russell Sanders





KAREN WESSEL

Homer Junior High School
Homer, Alaska

We live in the Anchor River Watershed–home, at its source, of the King Salmon whose fishery brings thousands of people to her banks on the Kenai Peninsula in Alaska every summer. Brown and black bear, moose, bald eagles, halibut, stellar sea lions, minke and orca whales, and the sea otter are among the many heralded citizens of this ecosystem, rich in Sitka spruce, red alder, and birch.

For eleven years, Homer Junior High has welcomed the spring with an exodus of students from its doors to the natural world of Kachemak Bay. As part of a natural science, writing, and art cross-curricular team, I have led groups of students into the words and waters and let them be a part of this world. Through sketching, we explore the stratigraphy of centuries, opening a window on the geology of the region. Climbing up the moraine of Grewingk Glacier, we experience the plant succession of glacial terrain, drawing, photographing, and writing along the way. We sit silent for twenty minutes under the canopy of old cottonwoods, listening, smelling, watching.

We break the silent meditation with our pencils–to sketch, to write, to create a record of our impressions in the immediacy of the moment. Perhaps there is an eagle's nest above or bear scat before us. Once we sat next to a depression in the last fall's leaves marked by tufts of black bear fur.

From our sketches and journals emerge the work of art, to be crafted, to be shared, to finally be published or displayed. Writers enter a workshop mode for peer comment and editing. Models of effective poetry and prose of the natural world help us to shape the art and sometimes to inspire it. More often it is born in silence, however, a silence where the senses reign, affording communion with other sentient beings of our home.

The headwaters of the Anchor River flow into the Cook Inlet and Kachemak Bay of the Pacific Ocean, the great water that finally mixes with all others, celebrating life and grieving pollution. Our students know these waters, because they feel them at their source. They feel them in a quiet breathing, a reverence, from which grows the art of poetry–and painting.

JO ANNE W. KAY

Fifth Grade Teacher, Tetonia Elementary School, Tetonia, Idaho

With a little help from community volunteers, elementary students can experience hands-on science in your community. Students can learn about local watersheds, water quality, and ecosystems in a day-long activity that will leave them wanting more.

A Day On the River begins with an orientation to watersheds. On the day before the activity, have students "build" mountains and valleys of rumpled paper. Using spray bottles, have students "rain" on their creations and the water will settle into "watersheds" that students can see. A good review of the water cycle will also help students understand what they will be experiencing.

Students arrive ready for A Day On the River with the following materials: warm clothes, good hiking shoes, a sack lunch, plastic containers, magnifying glasses, sample bottles, strainers, and small plastic zip-lock bags.

Upon arrival at your chosen site, students will rotate through the following activity stations during the day:

1. Water life: At this station, students screen the water from the river to discover insects and other living organisms that inhabit the river. They test the river for temperature, pH balance, phosphates, and bacteria (with the help of local biologists). Each team also creates a water ecosystem from the river in a plastic container that will be sent back to the classroom for observation.

2. Animal life: At this station, students learn about the animals that inhabit the river area. They look for signs of these animals and if they are lucky, observe the wildlife. They learn how to identify the wildlife that is common in this area. They also learn about food chains and animal survival.

3. River history: At this station, local experts tell the students stories of the river and its development. They also tell the students how the area has changed over the years.

4. Nature hike: Students take an hour-long hike along the river, identifying trees, plants, and undergrowth. They look for wildlife and collect specimens.

5. Nature art: During the hike, students stop and learn about nature sketching from a local artist. Students spend time selecting a plant from the river area to sketch and identify. They also use the materials found near the river to create nature sculpture, working in groups of three or four. When they are finished with their creations, they share what they have created with other members of the class.

Upon arrival back at school, students use the materials they have collected in their specimen bottles to create ecosystems in the classroom that can be observed for several weeks. They also take their nature sketches and create finished products for display.

BONNIE DANKERT

Santa Cruz High School
Santa Cruz, California

For many years, my deep interest has rested in seeking a way to design a course of study engaging students in regional habitat, educating them on the denigration of the watershed. Plumbing the depths of our ignorance, there lies a need to look into the water's shallows and call witness to the shadows of death. My choice was to focus on the avian community, specifically four California birds, the light-footed clapper rail, the elf owl, the brown pelican, and the peregrine falcon. The destruction of coastal watersheds is resulting in the alarming disappearance of many California species. Federal, state, and local water-management practices, land acquisition, private ownership, and the lack of suitable revegetated habitat directly affects every bird. This brings us to examine our nation's Endangered Species Act with careful analysis particularly on current proposals offered for consideration.

"Watersheds," an interdisciplinary blueprint, successfully provides a variety of avenues for students to access an elaborate network of communities, and make a personal connection. We educate one another through collaboration and a collective spirit. Wildlife artist Rochelle Mason's "Animals and Feathers" workshop introduced to students the complexities of aviary anatomy, causing us to further appreciate the unique beauty of a single feather. With pastels, watercolors, and sharpened pencils, in one afternoon of drawing exercises we discovered a delicate intimacy for these vanishing creatures.

Student research and field studies revealed the watershed's rich diversity, transposing multiple visions of each fragile community. To gather assorted perspectives, students interviewed local growers, visited organic farmers, and followed a running debate among activists, government officials, and business people concerned with the economy. We continually looped back to the vital necessity of The Endangered Species Act to underscore the importance of habitat preservation. Active involvement in such endeavors plants seeds for future stewardship.

The ramifications of watershed destruction branches into every river, slough, and ocean, influencing the quality of our water, the viability of our soil, the integrity of our intentions. The search for this land's legacy of rain-bearing rivers, high-rising mountains, and gently sloping beaches converges at the water's edge, where streams and tributaries are marked with the passing beauty of native, pink salmon.

THE ORION SOCIETY

The Orion Society is an environmental education organization that fosters nature literacy in people of all ages. The Orion Society's programs include publications and other teaching tools that seek to deepen our relationship with nature; teacher-training institutes, teaching fellowships, and model classrooms; writer tours that seek to cultivate holistically aware and environmentally caring citizens; and community-building projects that are working to reshape our economic and social institutions to make them more ecologically sustainable.

To receive more information on The Orion Society's programs and teaching resources, write to:

The Orion Society, 136 East 64th Street, New York, NY 10021.

Excerpt from

"Coming into the Watershed"

by Gary Snyder

A WATERSHED is a marvelous thing to consider: this process of rain falling, streams flowing and oceans evaporating causes every molecule of water on earth to make the complete trip once every two million years. The surface is carved into watersheds–a kind of familial branching, a chart of relationship, and a definition of place. The watershed is the first and last nation whose boundaries, though subtly shifting, are unarguable. Races of birds, subspecies of trees, and types of hats or rain gear often go by the watershed. For the watershed, cities and dams are ephemeral and of no more account than a boulder that falls in the river of a landslide that temporarily alters the channel. The water will always be there, and it will always find its way down. As constrained and polluted as the Los Angeles River is at the moment, it can also be said that in the larger picture that river is alive and well under the city streets, running in giant culverts. It may be amused by such diversions. But we who live in terms of centuries rather than of years must hold the watershed and its communities together, so our children might enjoy the clear water and fresh life of this landscape we have chosen. From the tiniest rivulet at the crest of a ridge to the main trunk of a river approaching the lowlands, the river is all one place and all one land.

The water cycle includes our springs and wells, our Sierra snowpack, our irrigation canals, our car wash, and the spring salmon run. It's the spring peeper in the pond and the acorn woodpecker chattering in a snag. The watershed is beyond the dichotomies of orderly/disorderly, for its forms are free, but somehow inevitable. The life that comes to flourish within it constitutes the first kind of community.

From *The Stream Scene,* published by Oregon's Fish and Wildlife Department

Watersheds

"The study of rivers is not a matter of rivers, but of the human heart."
–Tanaka Shozo

ALL LAND on earth is a **watershed.** Humans and their activities play an important and essential role in watersheds, yet few people understand them. Still fewer know the dynamics and boundaries of the ones in which they live.

A watershed is a system. It is the land area from which water, sediment, and dissolved materials drain to a common watercourse or body of water. For each watershed there is a drainage system that conveys rainfall to its outlet. A watershed may be the drainage area surrounding a lake that has no surface outlet, or a river basin as large as that of the Columbia River. Within a large watershed are many smaller watersheds that contribute to overall streamflow.

The point where two watersheds connect is called a **divide.** A watershed is drained by a network of channels that increase in size as the amount of water and sediment they must carry increases.

Streams are dynamic, open-water systems with channels that collect and convey surface runoff generated by rainfall, snowmelt, or groundwater discharge to the estuaries and oceans. The shape and pattern of a stream is a result of the land it is cutting and the sediment it must carry.

Stream Orders

In most cases, a watershed system is almost entirely hillsides. Only about one percent of a watershed is stream channels. The smallest channels in a watershed have no tributaries and are called **first-order streams.** When two first-order streams join, they form a second-order stream. When two second-order channels join, a third-order stream is formed, and so on. First- and second-order channels are often small, steep, or intermittent. Orders six or greater are larger rivers.

Channels change by **erosion** and **deposition.** Natural channels of rivers increase in size downstream as tributaries enter and add to the flow. A channel is neither straight nor uniform, yet its average size changes in a regular and progressive fashion. In upstream reaches, the channel tends to be steeper. **Gradient** decreases downstream as width and depth increase. The size of sediments tends to decrease, often from boulders in the hilly or mountainous upstream portions, to cobbles or pebbles in middle reaches. More sand or silt are found downstream. In some cases, large floods cause new channels to form, leaving once-productive streams dry and barren.

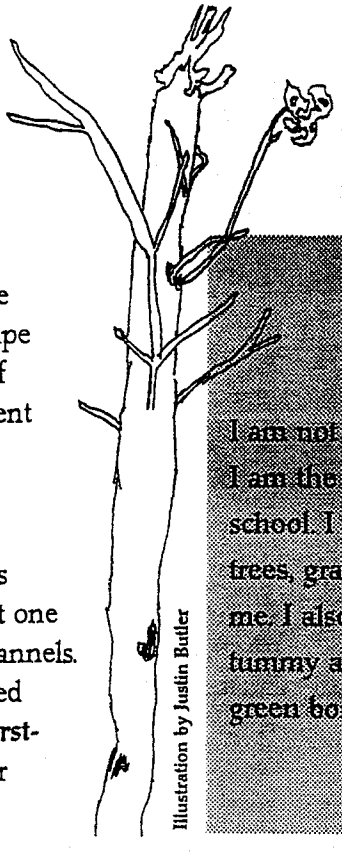


Illustration by Justin Butler

What Wolf Lake Said:

I am not as small as a mouse.
I am the size of the whole
school. I have dark green
trees, grass and flowers around
me. I also have water that fills my
tummy and lilypads as
green bones on my skin.

–Catrina Lee, 5th grade

Streamflow Types

Besides the ordering system previously described, streams may be classified by the period of time during which flow occurs.

- **Perennial** flow indicates a nearly year-round flow (90 percent or more) in a well-defined channel. Most higher order streams are perennial.
- **Intermittent** flow generally occurs only during the wet season (50 percent of the time or less).
- **Ephemeral** flow generally occurs during and shortly after extreme precipitation or snowmelt conditions. Ephemeral

Soils and Geology

Soil is a thin layer of the earth's crust. It is composed of mineral particles of all sizes and varying amounts of organic materials. It is formed from breakdown of parent rocks to fine mineral particles. This occurs by:

- Freezing and thawing in winter
- Heating expansion and cooling contraction in summer
- Wind and water erosion
- The grinding action of ice
- Gravity rockfall and avalanche movement
- Rock minerals in rain and snowmelt water
- Chemical action of lichens and other plants

Soils are of two types. **Residual** soils are those developed in place from underlying rock formations and surface plant cover. **Transported** soils include those transported by gravity, wind or water. Characteristics of residual soils are closely related to the parent material from which they were formed.

Climate, particularly precipitation and temperature, strongly affects soil formation. Rainfall causes **leaching**–movement of dissolved particles through soil by water. Temperature affects both mechanical breakdown of rocks and breakdown of organic material. Soil bacteria, insects, and burrowing animals also play a part in breakdown and mixing of soil components.

Soil often determines which plants will establish a protective vegetative cover. Plants also modify and develop soil. Plant roots create soil spaces. Plant litter adds organic matter to soil and extracts water and minerals in solution through the roots. Plant litter slows surface runoff and protects the soil surface from rainfall's beating and puddling effects. Soil depths and moisture-holding capacities are usually less on steep slopes, and plant growth rates are often slower.

Forage, timber, and water are all renewable resources. Water is renewed by cycles of climate. Forage and timber are renewed by growth in seasonal cycles. The availability of these resources is dependent upon soil. Soil is, except over long periods, a non-renewable resource. It may take more than a century to produce a centimeter of soil and thousands of years to produce enough soil to support a high-yield, high-quality forest, range, or agricultural crop. Soil is the basic watershed resource. Careful management and protection is necessary to preserve its function and productivity.

Vegetative Cover

Grasses, **forbs**, shrubs and trees make up the major plant cover types. All four types build up organic litter and affect soil development. They usually develop under differing climatic conditions and all are important to watershed management.

A forest usually includes, in addition to trees in various stages of growth, an understory of shrubs and a low ground cover of forbs and grasses. While all plants in a forest have some effect on water, trees are the most important. Tree-litter fall protects the soil's surface. Tree roots go deep into the soil and help bind it, and tree crowns provide the most shade. The effects of shrubs and grasses are similar to those of trees including increased protection for soil against the beating action of rain and drying action of the wind.

Plant cover benefits a watershed. The canopy intercepts rain and reduces the force with which it strikes the ground. The canopy and stems also reduce wind velocity.

When leaves and twigs fall, they produce litter, which decomposes and is eventually incorporated into the soil. Litter protects the soil surface, allows infiltration and slows down surface runoff.

Stems and roots lead water into the ground. Roots open up soil spaces for water retention and drainage as well as add organic materials to the soil. The movement of minerals from roots to canopy provides recycling.

Windbreaks of trees and shrubs protect crops and reduce moisture losses from evaporation. Grasses, trees, and shrub stems along riverbanks trap sediments and floating debris during high waterflows. Roots bind and stabilize streambanks and slopes to reduce slides and slumps.

MANAGEMENT CONSIDERATIONS

Water quality is largely determined by the soils and vegetation in a surrounding watershed. Accordingly, human activities have pronounced impacts on watershed quality. These activities include timber harvesting, livestock grazing, agriculture, recreation and urban or industrial development.

Timber Harvest

Timber harvest opens and reduces plant cover density. Timber harvest does not negatively affect a watershed if slope and soil are carefully considered and plant cover rapidly restored. In snow zones, timber harvest can

Streams from burned watersheds at first carry a heavy load of salts dissolved from ashes, floating debris, and erosion sediments. Water quality may soon return to normal, except for sediment-laden high flows. Water levels fluctuate and become less dependable. These conditions may continue for several years until the plant cover becomes re-established on the watershed.

Fire can be beneficial to a watershed when it is carefully managed. It can reduce available fuel and prevent more destructive fires. Fire thins understory seedlings that compete with larger trees for available moisture. Open forest types such as ponderosa pine are maintained by fire.

Beavers

The effects of beavers on a watershed can be both positive and negative. Their actions change watershed hydrology as well as damage cover. A beaver dam changes energy flow in its immediate area by turning part of a stream environment into a pond or swamp. If high beaver populations coincide with heavy livestock use, the results can be devastating to streams. On the other hand, their dams can be beneficial as sediment traps and fish habitat. Water held behind a beaver dam is released more slowly over a longer period of time.

Mining

Mining requires opening the earth to remove mineral resources. It is done by stripping off the surface soil and rock layers or by drilling tunnels into the earth to reach minerals.

With either method, quantities of waste material are left on the surrounding land. This waste material is subject to erosion, adding to the sediment load of streams draining the mined area. Surface changes include altered topography and drainage. Drainage from mined areas may contain toxic mineral salts harmful to the aquatic habitat. To prevent degradation of the watershed, waste material disposal must be controlled.

Development

Urban development involves:

- Clearing, leveling and filling land surfaces
- Constructing buildings with impermeable roofs
- Paving roads and sidewalks with impervious materials
- Installing sewage disposal systems

Such development greatly changes infiltration and runoff, reduces recharge to underground water and increases runoff to produce rapidly fluctuating streamflows.

High-quality water is described as cool, clear, clean, colorless, odorless, tasteless, oxygenated, free of floating and suspended materials, and carrying only limited amounts of dissolved materials. As quality is degraded, water becomes less and less useful for most purposes. Urbanization decreases water quality.

Point source pollutants enter waterways from a specific point. Common point source pollutants are discharges from factories and municipal sewage treatment plants. This pollution is relatively easy to collect and treat.

Non-point source pollution, on the other hand, is really a new name for an old problem—runoff and sedimentation. Non-point source pollution runs off or seeps from broad land areas as a direct result of land use. It comes from a variety of sources such as agriculture, urban construction, residential developments, timber harvest, roadsides, and parking lots. Sediment, fertilizers, toxic materials, and animal wastes are major non-point source pollutants. The diffuse source of these pollutants makes them more difficult to quantify and control than point source pollutants.

Non-point pollution causes more than half the water pollution problems in Oregon. The impact of non-point source pollutants on water quality is variable. Some are potential health hazards or harmful to fish and other aquatic organisms. Streams do have an absorption and disposal capacity for limited amounts of pollutants, but these limits are too often exceeded.

Urban air pollution, especially photochemical smog caused by internal combustion gasoline engine emissions and industrial smokes, has contributed to acid rain. This has had a subsequent effect on vegetation, streams, and lakes within watersheds, especially on the east coast and in Canada. The problem continues to grow, however, and the Pacific Northwest is not immune to the effects of acid rain.

Communication and transportation developments include roads, railroads, airports, power lines and pipelines. All of these may involve disturbance of plant cover, soil, and topography. Road and highway networks, with their impermeable paving and rapid drainage systems may radically change the runoff characteristics of their immediate area. They also require changing the natural topography and drainage, and moving huge amounts of soil and rock. Often these networks are responsible for extensive sediment production and may become the source of other water pollutants.

SUMMARY

Rivers, hillsides, mountaintops, and flood-formed bottom-lands are all part of one system. All are integrated with each other. Hillside shape controls the energy expenditure rate of water flow. All biotic elements in the watershed interact with and modify the energy flow through the system. So it follows that the shape of the watershed is a function of what lives there. The combination of climatic conditions, soil types, topography, vegetative cover, and drainage system define the particular character of each watershed.

In an unaltered state, a watershed is in a state of equilibrium. This equilibrium may or may not be the most suitable for the overall quality and contribution of the watershed to the entire picture.

Rivers do not stop at state lines. The effects of natural and human processes in a watershed are focused at its outlet, wherever it may be, even if it crosses another state or country's borders. Each watershed is a part of a larger watershed whose downstream portion may suffer from upstream influences.

ACTIVITIES

A first step in understanding watersheds is to explore your own local watershed. Since everyone lives within one, outline the boundaries of your watershed. Check with your local library for topographic maps if you cannot determine the boundaries visually.

a. On a map, trace the lines along the high points that separate your creek or river from the next.
b. Map the land use in your watershed (e.g., streets, forests, farms, yards, etc.)
c. List all possible places rain goes in your watershed.
d. Go outside the school building. What happens to the rain when it falls on the school roof? Does any of it get to a stream or river? How?
e. Are you ever anywhere that is not in a watershed?
f. Collect newspaper clippings on watershed management problems in your area.
g. In small groups have students design their own watershed. Each design should include the location, climate, uses of, abuses to, human impact on, and group perceptions of what a watershed should and should not be. After preparing visuals to depict their watershed, groups present their design to the class. (Contributed by Mary Roberts, 1989)

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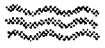
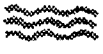
the force of gravity. This elevated land might be hills if the scale of your map is small or a mountain range if the scale is very large. High ground sheds water, so the term watershed is used to describe all of the land that surrounds a particular body of water.

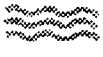
Draw in the hills or mountains that create the watershed where you live. Clue: Watersheds can be huge such as that for the Mississippi River with the Rockies on one side and the Appalachian/Allegheny Mountains on the other, or as small as the rise of ground that separates two creeks and the low hills around a pond in a park. Use a different color than the previous one showing water.



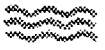
The next element to include in this map is soil. Use your memory of visits to different parts of the bioregion to draw in different types of soil such as sand, clay or black topsoil. Usually the highest ground is rockier than lower places because the lighter soil blows or washes away. If you remember seeing exposed rocks on hilltops, draw them in. The light soil that blew or washed away settles in valleys or other low places that are usually near bodies of water. Think of where this type of soil probably lies and draw it in. Clue: Farmers prefer nutrient-rich topsoil, so it can probably be found wherever you've seen fields and farm houses. Is there also sandy soil where you live? How about hard red clay? Use a new color (or colors) to draw these in. Add any other geological characteristics such as lava beds, granite cliffs, coral rock, caves, or salt beds that are unique to your bioregion.



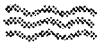
Next draw in some examples of plants and animals that are native to the place where you live. Native means that these are wild animals rather than domestic ones like dogs and cats or horses and cows. It also means plants that are indigenous rather than most of the ones that are grown for food or were brought from other places for some other reason. For example, oak trees are native to North American bioregions but apple trees aren't. Hint: Types of animals range from insects to fish and from birds to mammals. Plants include grasses, herbs, and shrubs as well as trees.



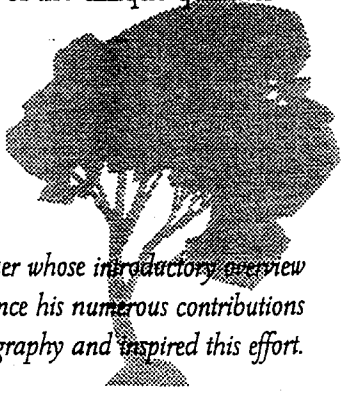
So far there haven't been any signs of human beings in this map. There are usually so many of them in all of the places where people live that most of them wouldn't fit. In order to focus your map in the present situation, draw in just two aspects of the human relationship to whatever other features you've drawn. The first one is a visual representation of the worst things people are doing. Hint: It could be a source of wastes that threatens to pollute all of the water. It could also be bad farming practices that are eroding soil, mining that is creating hazardous dumps, or dams that block the passage of fish in a river.



Now show the best thing people are doing to try to harmonize with the natural elements in the map. Hint: These may be organic produce or permaculture farms that maintain good soil, or recycling projects that reduce wastes. Some other beneficial activities could be renewable energy projects, efforts to restore forests or rivers, and other attempts to improve the balance between human needs and those of natural systems. Of course, this will be a matter of your personal opinion at this particular time but that's an important aspect of knowing how you perceive the place where you live.



This map is a view of your bioregion, and it is also a kind of flag for the place. It's a record of what you know and don't know at this moment, and it can be added to or redrawn as more information is gained. You've shown your home base in terms of the natural elements that ultimately support life there, These elements need to be restored where they have been damaged and preserved where they are still intact. Some of them should be seen as sources for supplying basic human needs of food, water, energy, and materials as long as this is done in ways that are sustainable for humans and other life. Your map shows a territory that needs support and defense. You many want to join together with other people who live in your bioregion to start finding out more about it and developing ways to live there that will be ecologically appropriate in terms of the unique qualities of that place.



Dedicated to Carl O. Sauer whose introductory overview MAN IN NATURE served to enhance his numerous contributions to the study of geography and inspired this effort.

My Philosophy of Teaching Poetry in the Classroom

by Sheryl Noethe
From *Poetry Everywhere*

EVER SINCE FIFTH GRADE, writing has been my better world, a refuge and solace where imagination is king. This is the opportunity we as teachers of poetry have before us in the classroom. We can offer this sustenance, this self-creation, to children, making their lives richer and happier and giving them more alternatives. Writing is a grip on existence, an empowerment, and a way to listen to the inner truth of the self. The poet enters a dialogue with all previous poets, singers, and writers. You keep great company.

When I read a poem to the class I read it as though it were the most important and only poem in the world. I use the opportunity to hook the students up to the heart of the poet. I use the poem as a force to pull our imaginations into the associative world of words and ideas. I read the poem aloud and make it real for them. Inadvertently, something rare happens when we begin to anticipate hearing a poem; we settle into a dreamy concentration, to sit back and hear the poem in a sort of reverie. Ask the class to daydream and let their minds fill with the images that the poet gives them. Put the world on HOLD for a while and pay attention to your inner life by letting the poem inside.

Eventually, you will find a different poem for everyone. If you persist in selecting and then learning wonderful poems to read aloud to the class, you will find that different students will respond to different poems, finally connecting with an idea or a phrase that touches them, and they will appreciate that singular thing that poetry does so well. "Ah!" the mind says, "wonderful!" Besides the inherent miracle of the poem, imagine teaching a subject where no one can fail, where the student will achieve some success and then crave more! Turn a child's identity into a respected position—a writer—and have him or her know there is nothing like success. Your job as a teacher is to tell every student what is right about his or her work. This calls for wit, compassion, and a huge frame of reference! Relationships develop with the exchange of history and imagination. Trust and empathy are aroused when you hear someone else's words echo your own feelings, in surprising ways and common ways, and you cannot stay strangers. When you point out to your students where they are at their best in their work—the funniest or the most imaginative or the truest to their vision—you give them success and they in return give you their trust. They write in the only way beautiful things are created—from the heart, without censorship or fear. That's when you get the poetry.

- Try different ways at different times (for example, combine two exercises, or try an entirely new warmup). Let the students know why you are taking a new tack.
- You can use pre-writing (days before the poetry session) and various warmup activities at the beginning of the session to immerse students in a given subject. A caution: there can be too much brain-storming, leading the kids to regurgitate info and use the same chalkboard vocabulary.
- Simply reading good books to students is a good preparation for writing.

2. Manner of Presentation and General Tips

*• Be yourself. You needn't and shouldn't show reverence for poetry by means of an artificially dignified atmosphere.
- "Walking around while teaching, sharing, and especially reading orally grabs all the students' attention, involves them as a community" (Chris Casterson, third grade teacher). It also helps lend a physical sense to the poetry.

*• Energy is the key–but it shouldn't be forced. It can be "quiet" energy.
- In some ways, you can be less "in charge." Much of the learning in poetry comes from the inside out.
- It's probably best not to "push" your beliefs about the beauties of poetry, but to let them emerge through examples and practice.
- Don't overexplain.

*• Avoid abstractions. When you speak in concrete terms, it helps bring out better poems. However, stressing "detail," "imagination," and "originality" repeatedly will tend to unify these words with their examples in the poems.

*• Read poetry aloud with energy, expressiveness, and rhythm (this can be the variable rhythm of everyday speech). For example, read or tell the Greek myths as if they happened this morning.
- Make a conscious choice as to whether to read with pauses at the ends of lines (which tends to emphasize the breath, the connection of poetry to the body) or not (which can emphasize the flow of sound and ideas).
- It's helpful to admit your own errors, blankouts, and ignorance. This helps create an open mood in the classroom.
- Presentation of sample material on overhead projectors can help students' visual comprehension (but the reading voice should always "carry" the work).
- When you know a kid, you can criticize his or her poem if you include encouragement (and if it's one-on-one, not public). "This part is full of great energy, but down here it just kind of falls apart–you need an image."
- Sometimes a little edge of sarcasm or sharpness in a general sea of kindness and warmth will help the students realize "We're really trying to do something here." It's not goof-off time.

The Rain of Fragrance

As I walk on the desert a drop of rain comes down but not just any rain the rain of fragrance as I still keep walking I hear voices of singing women and still the smell of fragrance every time I see women pouring buckets of perfume into the air. At last I stop and I disappear into the rain of fragrance.

–Luis Perez, 6th grade

- At any time, you can, if inspired, simply read or recite a good poem to the class–and that poem needn't have an obvious connection to what you're doing.

*• Maintain cheer and confidence if a student reacts negatively. Try to avoid confrontations; often the best approach is to ignore that student for the moment and concentrate on the rest of the class. Your positive attitude and the peer influence of the majority's participation will probably bring the recalcitrant student along.
- If your students seem to have trouble getting going, tell them to flap their elbows and just start scribbling. Urge spontaneity in different ways. "Work it out on paper, don't try to think it all up in your head first." "It can be messy, shows you're thinking; this is a worksheet. We'll make them pretty later." Perhaps suggest that they can copy topics from other kids, if their own treatment is original.

*• Never tire of pounding home the happy use of details, as opposed to generalities.

*• A brisk pace is good, energizing, as long as you're willing to be flexible and slow down when the situation needs it.

*• Don't worry. Decide thoughtfully what you're going to do, then let 'er rip. Relax and concentrate. Have fun. Freely intersperse humor and seriousness.

*• Be open to children's visions–they really have them.

- You can start reading the kids' work aloud (and tell the class to be quiet and attentive) when all but a few papers are in. (No harm if a few are still working).

C. Reading their works aloud

- Again, read the poems expressively and rhythmically (if you read them).
- If the kids don't want their names read aloud, respect this, but in time try to lead them out of their shyness–as long as it doesn't deter them from writing freely. Younger students sometimes like the option of raising hands or standing after their poems are read.

*• It's a definite plus if students practice reading their poems aloud, especially older kids. But use your discretion–the virtues of the poems may get lost in poor renditions. If the students do read, urge pizazz. Tell them to read "so the termite eggs embedded in the far wall can hear it," or something. It's okay if some of them volunteer to read and others don't.

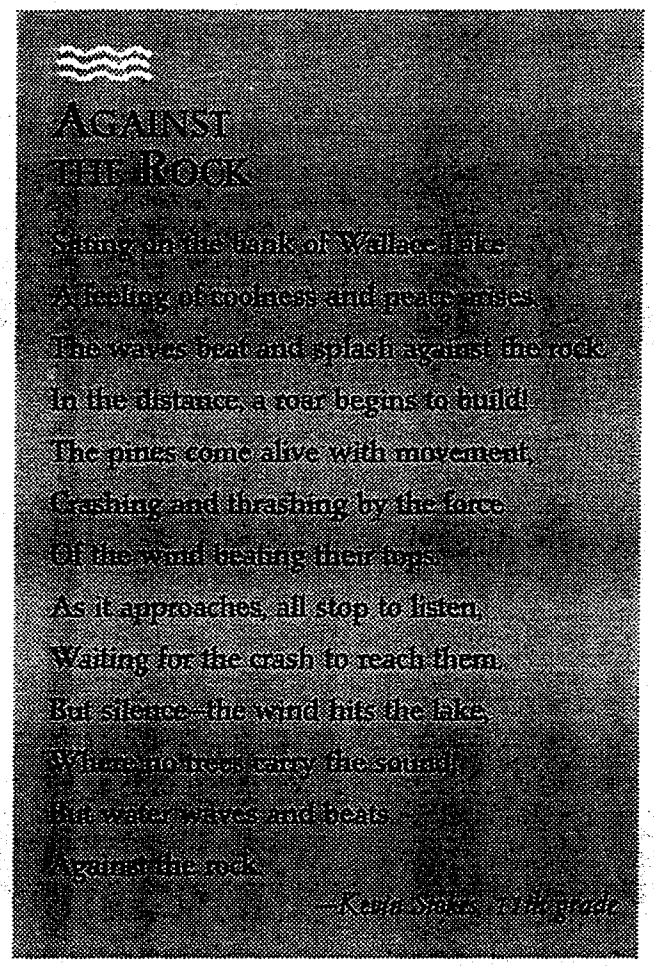
*• It's best not to criticize student work when its first read; respond with cheer to each kid's piece. Discrimination can be exercised by selective intensity of praise. They'll note this and learn from it. Never give false praise. Be as concrete as you can in each bit of praise. Repeat good words or phrases they've written. You can often praise rhythm or energy or spirit or originality when it's hard to find anything else to praise. But don't let your comments get so long as to impede the flow of their work. A hearty "All right!" will often suffice.

- When students read collaborative poems aloud, try having them do choral readings–divide the class in various ways (blue eyes, brown, even or odd rows). Have them read in different voices–scared, baby, laryngitic, as The Principal, etc.

4. Afterwards

*• Typing up student poems preserves and honors them and makes them available to others. We strongly recommend typing up a selection. Kids love to see their work "in print."

- When typing up, correct spelling routinely (unless it has some special charm) but take grammar on a case-by-case basis. Poetry is always creating its own voice, so "correctness" is relative. In regard to punctuation, suggest–but don't insist– that it be consistent within a given poem.



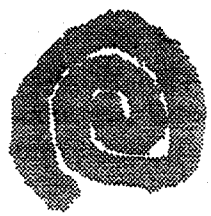
Against the Rock

Sitting on the bank of Wallace Lake
A feeling of coolness and peace arises.
The waves beat and splash against the rock.
In the distance, a roar begins to build!
The pines come alive with movement,
Crashing and thrashing by the force
Of the wind beating their tops.
As it approaches, all stop to listen,
Waiting for the crash to reach them.
But silence–the wind hits the lake,
Where no trees carry the sound.
But water waves and beats
Against the rock.

—Keira Stokes, 7th grade

- Often it's hard to tell whether a student piece is written with linebreaks or not. If there's time you can check with the author. Otherwise, look each piece over before typing and decide the apparent intent, then type accordingly. Sometimes, even if paper-width seems to have dictated the shape, the poem will "feel right," and you should type the poem up they way the student wrote it.
- If a poem or piece is off-task but good (interesting), take it.
- It helps students care for their work if you have them keep it in special folders to which they have free access.
- Then you can have the students bring out, reread, and illustrate their words.

*• In any case, student poems should be kept and can then be typed up, put on bulletin boards, published schoolwide, sent to pen pals, individually published by the students themselves, and distributed in the community.



Basic Creativity

by Hannah Hinchman

WE CHERISH the myth that kids are unfettered creative souls. In reality, even in the earliest grades, they are already burdened by intimidation and uncertainty when it comes to the mystery of art. Too many students, too early, lose the vital confidence in their own eyes and hands that would allow their creativity to blossom. Instead, they resort to repetitive or formulaic picture-making, or learn to copy whatever looks "accomplished" from another student. Without skillful deflection from an alert teacher, many of them will get mired there, until they bore themselves out of any continuing interest in art.
I consider creativity–that nebulous and highly charged word–to refer to several basic instincts or urges, common to everyone. The trick is in figuring out ways to keep students in constant touch with those fundamentals, to keep their desires aflame, but hooked to tangible skills all along. Here are some of my observations about how creativity works in art, and ways you can keep it working.

Remember the simple joy of "stuff." The urge to play with materials comes before the desire to make specific images or shapes. Just the tactile, visceral act of moving brush, pen, pastel over different kinds of paper holds a satisfaction all its own. Shaping and molding a yielding substance is pure fascination. Pay attention to the tools, and find out everything they can do. Find out what they *want* to do. Some of the most common tools, like wax crayons, can be frustrating to a child who craves dense, brilliant, dazzling colors. Point her towards pastels, oil pastels or Prismacolor pencils if you can. If crayons are all you have, help her find ways of using them that begin to come close to her yearning. Try to help her find the right surface to use them on–it might not be construction paper. And there's a boy who has visions of intricate, complicated patterns, but he's using a fat marker on newsprint! Introduce him to the glories of a sharp, really sharp pencil (brought to perfection with an X-acto knife and sandpaper), and then maybe a variety of fine-tipped pens. Don't lose touch with the physical act of making art. Remind students of that basic pleasure and help them explore and use it. It's one of creation's primary fuels.

Encourage the hand-eye link as early as you can. Though "copying nature" came to have a bad name in the era of abstract-dominated art, it's one of the most vital episodes in developing creativity. For a student to discover that she can place a leaf, a nutshell, a bone on her desk, really look at it, and translate its nature onto the page is almost alchemical in the excitement it generates. Surprisingly few classrooms devote time to drawing from life. A book like *Drawing on the Right Side of the Brain* (enthralling reading even if you don't consider yourself an artist) will help you lead students towards realizing that they *can* draw what they see. And so can you.

The link between the eye and the hand is really so simple–think of the hand as a kind of seismograph, recording the movements of the eye in the act of observing. Once a child experiences that link, whole worlds open up.

Many children, especially at certain ages, don't want to draw things around them. They'd rather bring inner pictures, dramas, events, and situations out onto the page. Respect this, but keep in mind that drawing from life develops a visual vocabulary–of shapes, spaces, textures, expressions, gestures–that will add potency to the inner vision.

And drawing from life helps the student get past "symbol drawing," the stultifying stick with the ball on top that means "tree," done the same way every time (occasionally with smaller balls for apples, as a variation). Slowly, actual observation is replaced by a set of symbols that stand for something, and a creative door closes. Many students get sucked into that eddy and never get out.

Help students accept that art requires patience. It doesn't spring complete and perfect from the mind to the page. Creating something has much more to do with false starts and scary moments, when the marks you've made so far look like nothing recognizable. That's when you need to say, "hold on, things are going to get weird for awhile, it will come out okay in the end." A lot of fumbling, fixing, re-visioning, re-searching goes into the creation of anything of integrity. It can get frantic and desperate sometimes, but you can help reinterpret those feelings as excitement rather than fear. If your student is stuck with a certain approach, branch out laterally, bring in new materials. Or ask him to close his eyes for a moment to go back to what it was that originally moved him.

Art can require a daunting amount of time and patience. It's not simply a matter of making a picture, then you're done. In art school, we were pushed to take one idea through what seemed like endless permutations–bewildering and irritating to many of us. But that's one of the ways we learn what it is to create: it doesn't just happen. And the urge to get it right should be honored and aided.

Yes, sometimes it appears as a spontaneous, fresh sketch...but other times, we're required to dig, grope, and wait. And ask more of ourselves and our tools than we ever thought they contained.

The Stream Scene: Watersheds, Wildlife & People
Oregon Dept. of Fish and Wildlife
Office of Public Affairs
PO Box 59
Portland, OR 97207
Tel: 503-229-5400 x428

Discovering Your Life Place: A First Bioregional Workbook
by Peter Berg
Planet Drum Books
PO Box 31251
San Francisco, CA 94141
Shasta Bioregion USA
Tel: 415-285-6556

Save Our Streams
Isaac Walton League
1401 Wilson Blvd, Level B
Arlington, VA 22209
Tel: 1-800-453-5463

Clean Water, Streams & Fish
Washington State Office of Environmental Education
17011 Meridian Ave. N., Rm. 16
Seattle, WA 98122
Tel: 206-542-7671

ART RESOURCES

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Library of Congress
Washington, DC 20540-8200
Tel: 202-707-5221
Fax: 202-707-9898

Kennedy Center for Alliance for Arts Education Network
Kennedy Center
Washington, DC 20566-0001
Tel: 202-416-8845
Fax: 202-416-8802
Email: artsedge@kennedy.center.org
http://artsedge.kennedy-center.org

Nat'l Art Education Association
1916 Association Dr.
Reston,VA 22091
Tel: 703-860-8000
Fax: 703-860-2960

National Assembly of Local Arts Agencies
927 15th St.
Washington, DC 20005
Tel: 202-371-2830
Fax: 202-371-0424

National Writing Project
615 University Hall
UC Berkeley
Berkeley, CA 94720
Tel: 510-642-0963
Fax: 510-642-4545

Teachers and Writers Collaborative
5 Union Square West
New York, NY 10003-3306
Tel: 212-691-6590
Fax: 212-675-0171

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This bibliography was compiled with the help of Christian McEwen and Carol Murphey.

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A Natural History of the Senses: Diane Ackerman (Vintage Books, New York 1990). Filled with amazing details about all five senses that kids (and grownups too) will love.

Sisters of the Earth: Edited by Lorraine Anderson (Vintage Books, New York, 1991). Poems, essays, stories, and journal entries by a wonderfully wide range of women writers, from Willa Cather to Joy Harjo, from Emily Dickinson to Adrienne Rich.

The Norton Book of Nature Writing: Edited by John Finch and John Elder (W.W. Norton, New York and London, 1990). Superb range, probably the best of all the many nature anthologies available.

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Earth Prayers From Around the World: Edited by Elizabeth Roberts and Elias Amidon (Harper, San Francisco, 1991). A book of readings for the turning year. It includes some unusual selections (Rumi, Native American chants, Neruda, Thich Nhat Hanh).

Water Music: Jane Yolen and Jason Stemple (Boyds Mills Press, Honesdale, PA, 1995). A lovely children's book of poems and photos about rivers.

TECHNICAL

The Poetry Writing Handbook: Neil Baldwin (Scholastic Books, 1981). A modest and informative primer; a useful introduction to the teaching of poetry.

Poetry Everywhere: Teaching Poetry Writing in School and in the Community: Jack Collom and Sheryl Noethe (Teachers & Writers, 1994). One of the liveliest of the many teaching guides put out by T&W. Contains 60 writing exercises and more than 450 example poems (for excerpt see p. 25).

A Crow Doesn't Need a Shadow: Writing Poetry from Nature: Lorraine Ferra (Gibbs Smith, 1994). Lots of good writing exercises for kids, with student examples too, and some excellent illustrations. Genuinely fresh and inspiring.

The Poetry Connection: An Anthology of Contemporary Poems with Ideas to Stimulate Children's Writing: Kinereth Gensler and Nina Nyhart (Teachers & Writers Collaborative, 1978). A crisp, well-organized handbook with many imaginative examples.

Rose, Where Did You Get That Red?: Kenneth Koch (Vintage Books, 1973). One of the classic handbooks for teaching great poetry in the classroom.

Teaching Kids to Love the Earth, Sharing a Sense of Wonder: 186 Outdoor Activities for Parents and Other Teachers: Marina Lachecki Herman, Joseph F. Passineau, Ann L. Schimpf, Paul Treuer (Pfeifer-Hamilton, 1991). A compendium of ideas, most geared to small groups of children in the outdoors. Excellent book lists and usable indoor teaching ideas, too.

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Riverkeeper: George Ancona (Macmillan, New York, 1990). This tells of the work of John Cronin, who keeps environmental watch on Hudson River. Text and photos illustrate his day-to-day activities. (Upper elementary and middle school)

Where the Forest Meets the Sea: Jeannie Baker (Greenwillow Books, New York, 1987). A father and son think about the history of plant and animal life in the riparian environment in the Australian rainforest environment, one of the oldest in the world, and the real life threat it faces. (Primary)

The World That Jack Built: Ruth Brown (Dutton Children's Books, New York, 1991). The story is set in the English countryside, where a cat goes from the beautiful grounds of the house that Jack built to the polluted stream and valley where Jack's factory resides. (Primary)

A River Ran Wild: Lynne Cherry (A Gulliver Green Book, Harcourt Brace Jovanovich, Publishers, New York, 1992). Set in Massachusetts and New Hampshire, this is an environmental history of the Nashua River from its discovery by Indians to its death by industrial pollution and its subsequent revitalization. (Upper elementary)

Amazon Basin, Vanishing Cultures: Jan Reynolds (Harcourt Brace and Company, New York. 1993). The Yanomami live in the Amazon River basin, the largest tropical riparian environment in the world. Dramatic photographs and a simple narrative invite readers to experience the daily life of a vanishing culture. (Elementary)

Deaf Maggie Lee Sayre', Photographs of a River Life: Maggie Lee Sayre' (University Press of Mississippi, Jackson, MS, 1995). In 1930, Maggie Lee Sayre' began taking pictures with a camera given to her sister. Maggie was born deaf. She began to use film to record her life in a fishing family, on a houseboat along the Ohio and Tennessee Rivers. The camera became a way of communicating her identity and of engaging in a dialog with a hearing world. (Elementary, middle school and high school)

Vanishing Peoples, Yanomami, People of the Amazon: David M. Schwartz (Lothrop, Lee and Shepard, New York, 1995). The Yanomami people live where Brazil meets Venezuela. Gold miners are presently poisoning their river and destroying their way of life. This book documents their daily ways in hopes that it will encourage people to preserve, not destroy, their way of life. (Elementary and middle school)

**River Through the Ages*: Philip Steele (Eagle Books, Troll Associates, U.S.A., 1994). This book takes you on a time journey through a fictitious riparian environment in northern Europe. It examines how people living along the river develop and change their environment over timefrom the Stone Age into the future. (Upper elementary and middle school)

Where are you going Manyoni?: Catherine Stock (Morrow Junior Books, New York, 1993). The book describes the long walk to school of a child in Zimbabwe. During the course of the walk we become acquainted with African life in a rural area along the Limpopo River. (Elementary)

**Native Americans, The People and the Land*: Dana Walker (Frank Schaffer Publications, Carthage, IL, 1993.) Interactive, cooperative lessons about conflict over land between the US government and the Quinault, Taos, Flathead, and Salish Indians.

**Yangtze, China's Longest River*: How Man Wong (China Books and Periodicals, San Francisco, 1989). The people are explored in this book, as well as the environment and the journey on the Yangtze. All of these are documented in photographs and text. (Middle school and high school)

RIVERS AS BORDERS

Across the Great River: Irene Beltran Hernandez (Arte Publico Press, University of Houston, TX, 1989). This is a novel documenting the trials of a family that crosses the Rio Grande illegally, with a "coyote," to enter the United States at Eagle Pass, Texas. (Middle school)

**Exploring Rivers*: Derek Cullen and John Murray-Robertson (Schoolhouse Press, Needham, PA, 1988). The story of the exploration of some of the major rivers of North America, South America, Asia and Africa are included in this book. (Upper elementary and middle school)

**A Day on the River*: Reinhard Michel (Barron's Educational Series, Inc., Hong Kong. 1985). The story is about the author's youth growing up at the mouth of the Danube in lower Bavaria. It tells, in pictures and words, of the river in the early 1950s and ends with its death at the present time. (Upper elementary and middle school)

**Native Americans, The People and the Land*: Dana Walker (Frank Schaffer Publications, Carthage, IL, 1993). Interactive, cooperative lessons about conflict over land between the US government and the Quinault, Taos, Flathead and Salish Indians.

Friends from the Other Side, Amigos del Otro Lado: Gloria Anzaldua (Children's Book Press, San Francisco, 1993). This book is in English and Spanish. A young boy has crossed illegally to Texas from Mexico and receives help from a brave Mexican-American girl. (Elementary)

RIVER AS A METAPHOR

Parallel Myths: J. F. Bierlein (Ballentine Books, New York, 1994). This book explores myths from around the world in depth. Among the many sections presented are an international collection of creation myths and a similar collection of flood myths. (High school)

How the Farmer Tricked the Evil Demon: Alice Lucas (Pacific Asia Press, A Greenshower Corp., Covina, CA, 1994). This book is written in Hmong and English. It is a classic Cambodian storyteller tale about a clever rice farmer. (Elementary)

Tales from the Amazon: Marin Elbl and J. T. Winik (Hayes Publishing Limited, Ontario, Canada, 1986). This book has three tales told by the indigenous people of the Amazon. (Elementary)

Legends of Earth, Air, Fire and Water: Eric and Tessa Hadley (Cambridge University Press, New York and London, 1985). This is a collection of stories from around the world. (Upper elementary)

The River that Gave Gifts: Margo Humphrey (Children's Book Press, San Francisco, 1987). This is an Afro-American story about four children who make their own special gift to the beloved elder woman of the town. (Elementary)

The River that Went to the Sky: Mary Medlicott (Kingfisher, New York, 1995). Among the twelve tales of African storytellers in this book, some deal with rivers. (Upper elementary and middle school)

How We Came to the Fifth World: Harriet Rohmer (Children's Book Press, San Francisco, 1988). The text is in English and Spanish and is a creation myth from ancient Mexico. (Elementary)

How Night Came: Joanna Troughton (Bedfrick/Blackie, New York, 1986) This is a tale told by the Tupi Indians of Brazil. The daughter of the great snake living in the river marries a mortal and night and day come into being. (Elementary)

How the Birds Changed Their Feathers: Joanna Troughton (Bedfrick/Blackie, New York, 1986). This is a tale told by the Arawak Indians of Guyana. A rainbow snake living in the river is captured and the birds, who are white, gain color. (Elementary)

The Laughing River: Elizabeth Haze Vega (Rayve Productions Inc., Windsor, Canada, 1995). The story of peace is incorporated with scored music and is intended to be performed with Orff instruments. Instructions for making some of the instruments are included. (Elementary)

The Legend of the River Li: M. Jeanne Lee (Holt, Rinehart and Winston, New York, 1983). This ancient Chinese tale tells of a sea princess who wishes to lessen the hardships of the poor laborers employed in building the Great Wall of China. She seeks help from the Goddess of Mercy and the beauty of the River Li is the result. (Elementary

TECHNOLOGY RESOURCES

Amazon Trail (MECC Macintosh Disks). Students learn about plants, animals and the rainforest environment while trying to survive an expedition to find a Peruvian king.

Decisions, Decisions: The Environment. (Tom Snyder, Macintosh, IBM, Apple). Students interact with the computer to make decisions about the cleanup of a polluted pond. The Mayor, with the advice of his advisors, an environmentalist, a campaign manager, a scientist, and an economist, must set priorities for the cleanup as the Mayor faces an upcoming election.

Stellar Schools: Project Rivers. Project Rivers is a combined effort of the Stellar Schools initiative of STEM-Net and Cable Atlantic, along with the Friends and Lobbyists of the Waterford River and the Quidi Vidi/Rennies River Development Foundation. It brings together the resources of all these groups to provide the basis of classroom projects that will use the latest in communications technology to help classes appreciate riparian environments. 710, http//www.stemnet.nf.ca/Projects/Stellar/stelriv.html(Excite)

Operation Watershed. CD-ROM (Windows & Mac). A computer environmental adventurethat involves teams of players in a mission to solve environmental problems. Players use collaborative decision making as they attempt to solve cases.
National 4-H Council Supply Service
c/o Crestar Bank
PO Box 79126
Baltimore, MD 21279-0126
Tel: 301-961-2934
Fax: 301-961-2937

SOME INTERESTING WEBSITES:

California Academy of Sciences
http://www.calacademy.org
Exploratorium
http://www.exploratorium.edu/
John Muir Exhibit
http://aldo.des.ucdavis.edu.John_Muir/John_Muir_Ehibit.html
Radar Images of Earth
http://www.jpl.nasa.gov/sircxsar.html
U.S. Geological Survey
http://info.er.usgs.gov/

(An * indicates a book listed more than once because it fits in more than one category.)

River of Words Curriculum Supplement

What's Your Ecological Address?

What follows is an adaptation of a quiz on basic perception of place that was originally published in *Co-Evolution Quarterly*, now known as *Whole Earth Review*. The quiz is culture-bound, favoring those children who live in the country over city dwellers, but even questions difficult for urban kids to answer (like naming edible plants in their region, for example) provide interesting possibilities for discussion and research (what kind of edible plants *used* to grow in my area?).

1. Where does your tap water come from?

2. Where does your garbage go?

3. How many days till the moon is full?

4. When was the last time a fire burned your area?

5. What were the primary subsistence techniques of the culture(s) that lived in your area long ago?

6. Name five edible plants in your region.

7. From what direction do winter storms generally come in your region?

8. How long is the growing season where you live?

9. On what day of the year are the shadows the shortest where you live?

10. Name five resident and five migratory birds in your area.

11. What is the land use history of where you live?

12. What species have become extinct in your area?

13. What kind of soil are you standing on? (It's down there somewhere, no matter where you're standing.)

14. From where you're reading this, point north.

15. What river basin (watershed) are you living in?

16. What creek runs closest to your school? (Remember, it might be underground.)

Quiz compiled by: Leonard Charles, Jim Dodge, Pamela Michael, Lynn Millman, Victoria Stockley

October. Rivers in the far north are also highly seasonal, with minimum flows during the frozen winter followed by huge floods during the summer melt.

The great milestones of human history took place by the banks of rivers. Fossilized remains of our earliest known hominid ancestor were found by Ethiopia's Awash River. Evidence of the momentous change from mostly nomadic hunting and gathering to sedentary farming first appears in the narrow river valleys of the mountains of the Near East at archaeological sites between nine and ten thousand years old. The first civilizations emerged in the third millennium BC along the Euphrates, Tigris, Nile and Indus, and a little later along the Yellow. Much later another momentous turning point in human history occurred along the rivers and streams of northern England which powered the early industrial factories.

Rivers, and the rich variety of plants and animals which they sustain, provide hunter-gatherer societies with water for drinking and washing, and with food, drugs and medicines, dyes, fibres and wood. Farmers reap the same benefits as well as, where needed, irrigation for their crops. For pastoral societies, who graze their herds over wide areas of often parched plains and mountains, perennial vegetation along the banks of rivers provides life-sustaining food and fodder during dry seasons and droughts. Towns and cities use (and misuse) rivers to carry away their wastes. Rivers also serve as roadways for commerce, exploration and conquest. With the exception of a few maritime societies, 'all the great historic cultures,' writes technology historian Lewis Mumford, 'have thriven through the movement of men and institutions and inventions and goods along the natural highway of a great river.'

The role of rivers as the sustainers of life and fertility is reflected in the myths and beliefs of a multitude of cultures. In many parts of the world rivers are referred to as 'mothers': *Narmadai*, 'Mother Narmada'; the Volga is *Mat' Rodnaya*, 'Mother of the Land'. The Thai word for river, *mae nan*, translates literally as 'water-mother'. Rivers have often been linked with divinities, especially female ones. In Ancient Egypt, the floods of the Nile were considered the tears of the goddess Isis. Ireland's River Boyne, which is overlooked by the island's most impressive prehistoric burial sites, was worshipped as a goddess by Celtic tribes.

The rivers of India are perhaps wrapped in more myths, epic tales and religious significance than those of any other nation. Environmentalist Vijay Paranjpye describes a

CREATING A WATERSHED IN YOUR HAND

SUMMARY:
Students use crumpled paper to create a miniature watershed model that demonstrates the basic geography of a watershed, how water flows through this system, and the impact people can have on the quality of our water.

GRADES: K–12

TIME: 10 to 30 minutes

MATERIALS:
- 8 1/2" x 11" paper; one sheet for each student
- 3 different colors of water soluble markers
- several spray bottles of water

SETTING: classroom

BACKGROUND:

A watershed is a geographic area in which water, sediments and dissolved minerals all drain into a common body of water like a stream, creek, reservoir or bay. A watershed includes all the plants, animals and people who live in it, as well as the non-living components like rocks and soil. We are all part of a watershed, and everything we do can affect the surface and ground water that runs through this system. When you create your miniature watersheds, be sure to use water soluble markers—as the markers 'bleed' they demonstrate how rain moving through the watershed affects soil erosion and urban runoff.

ACTIVITY:

1. To create the watershed, crumple a piece of paper up into a tight ball. Gently open up the paper, but don't flatten it out completely. The highest points on the paper now represent mountain tops, and the lowest wrinkles represent valleys.

2. Choose one color of water soluble marker and use it to mark the highest points on the map. These points are the mountain ridge lines.

3. Choose a second color and mark the places where different bodies of water might be: creeks, rivers, lakes, etc.

4. With a third color mark four to five places to represent human settlements: housing tracts, factories, shopping centers, office buildings, schools, etc.

MAPPING YOUR WATERSHED: USING A TOPOGRAPHIC MAP

SUMMARY:
Students use a topographic map to define the boundaries of the watershed around their school.

GRADES: 3–12

TIME: 1 hour

MATERIALS:
- topographic map which includes your school site
- a road map of the area around your school
- clear sheet of plastic the size of your map (mylar or acetate is available at art and office supply stores)
- dry erase markers and eraser or tissues
- other topographic maps for comparison and for learning about reading maps (optional)

SETTING: classroom

BACKGROUND:

A topographic map has lines to help you determine the height of mountains, hills, and valleys. These lines connect points on the map that are at the same altitude. By connecting the high points and ridges on a map you can locate the boundaries of your watershed. Locating your school on a topographic map can make it easier for students to understand how they fit into a watershed, where their stream or creek gets its water and how their actions can have an impact on the flow of water, for better or for worse. This activity is a good follow-up to the activity "Creating a Watershed in Your Hand."

ACTIVITY:

1. Have students study different topographic maps to become familiar with the markings on the maps and what they can tell us. How do these maps help us to determine the highest and lowest points?

2. Cover the topographic map with plastic and tack or tape it up on the wall. (Covering the map with plastic will allow you to reuse the map for other classes, or for other activities. If you use dry erase markers you will be able to reuse the plastic covering as well.) Locate your school and mark it with a dry erase pen. You might need to use a street map to help you locate your school, house, etc.

3. Find bodies of water (creeks, streams, reservoirs, marshes, bays, etc.) and mark them in blue.

EXTENSIONS:

- Contact your City's storm water representative and ask them to come in to show you how the storm drain system works, and to help you locate this system on your map.
- Create a photo display or video illustrating your watershed. Follow the path of water through your watershed on a walking or driving trip, from one of the highest points in the watershed down to where runoff would meet up with a larger body of water, and take pictures of the landscape, evidence of runoff, physical features that impact flow, etc.
- Do some research on land use and management issues in your community that might affect rain and runoff in your watershed. Look for articles in the local newspaper and interview city officials, farmers and gardeners, park rangers, etc.
- Study the Native Americans that once inhabited your area. Where in the watershed did they live? How did their actions affect the quality of water?

- Scientific reports, studies, readings from naturalists' journals
- Books and specific field guides

Cultural history:
The human influence on and response to the site past and present

- Interviews with long-time residents and others involved with the site
- Archeological and anthropological reports and studies
- Historic routes (trails, waterways, etc.)
- Settlement patterns
- Economic development of the area, land use history
- Specific site histories
- Historic photos
- Newspapers, local library and county records
- Environmental issues today that affect the site, including scientific opinions and local sentiment
- Books by local authors (past or present) in which the site plays a role
- Poems, songs, movies or plays about the area
- Art that depicts the site or its denizens
- Folkways and crafts of the region (basketry, boat building, etc.)

Adapted from "A Sense of Place for Environmental Education and Interpretation," by Jeanie & Richard Hilten

RIVER of WORDS
ENVIRONMENTAL POETRY & ART PROJECT

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From the Acceptance Speech for the 1998 River of Words "Teacher of the Year" Award

Why write poetry?

Why teach the writing of poetry?

This is America in the late twentieth century. Our marketplace attitude of "the firstest with the mostest" leaves little time and even less respect for contemplation.

Rivers and poems insist on going their own way. Small wonder then, that those who would dam and reroute rivers for the sake of production and protection would also feel threatened by the force that creates poetry. It is a wild force. You do not control it—you follow it.

So why encourage such wildness? Because it is alive. It is the force of life and if you try to dam the force of life, first you get stagnation, then pollution, and finally, death.

Being an advocate and practitioner of poetry and the wild in all of us does not make one a successful citizen, if success is based on accruing material wealth. Poets and teachers don't do that. I make my living by applying for grants, or being chosen by a school staff to receive a small part of their discretionary budget, or by the contributions of parents whose children come home saying, "Today I had the most fun in poetry!"

I had the most fun. A recent study, investigating how people learn most effectively, discovered that we learn better when we're having fun.

So why is writing poetry so much fun? Because it's alive. To create something is to bring it to life. To dig down inside of our minds and hearts and find what is new there; to take that new stuff and—with hard work and discipline—pull it out and give it a new form. Tangible, audible, sharable. And then to know that we have the ability to do that again and again. *To make ourselves tangible, audible, sharable.*

— Grace Grafton
California Poets in the Schools
San Francisco Public Library
April 19, 1998

River of Words™ Contest Entry Form

Note: If we can't read your handwriting, you can't win a prize and you won't get your Watershed Explorer™ Certificate. So, please print carefully and use a pen!

Date: _____(**IMPORTANT! I am entering as an individual___ , OR, as part of a class/group____.**)

Name:_____ Age:___ Grade:__ Male: __ Female: __

Note: If you are entering as part of a group you MUST indicate whether you are entering through school, Girl Scouts, summer camp, park district, library, or other organization below.

School or Organization_____

School/Org Address:_____City:_____

State___ Zip/Postal Code_____ Country:_____ School Phone No:_____

Teacher/Facilitator(s):First Name:_____Last:_____

Title of Submission:_____ Art:___Poem:___ (Check one)

Parent or Guardian's Name:_____ **Signature:** _____

Home Address: _____ City:_____

State___Zip/Postal Code_____ Country:_____Home Phone:_____

I hereby grant and assign to the River of Words (ROW) Project the non-exclusive right and permission, in respect of the original writing, artwork or photos that I have submitted to River of Words, to use, re-use, publish, and re-publish, and otherwise reproduce, and display the same, individually or in conjunction with other original artwork, writing, photos, and video, in any and all media now or hereafter known throughout the world, for illustration, promotion, art, advertising, and trade, or any other purpose whatsoever; and to use my child's name to identify the author of the work in connection with my participation in the River of Words Project. I understand that any use of this submitted work will include my child's name as its creator. I hereby release and discharge River of Words from any and all claims and demands arising out of or in connection with the use of the original artwork, writing, photos, and video, including without limitations any and all claims for libel or invasion of privacy. In any of the winning categories, River of Words maintains the exclusive right to declare no winner and withhold prizes if no poem or artwork of merit is found. ROW assumes no responsibility for lost or damaged poetry or artwork. River of Words may sell, assign, license, or otherwise transfer all rights granted to it hereunder. This authorization and release shall also inure to the benefit of the successors, legal representatives, licensees, and assigns of River of Words. I have read the foregoing and fully understand the contents thereof. This release shall be binding upon me and my heirs, legal representatives, and assigns. I further release River of Words from any responsibility for injury incurred during the research or production of the original writing, artwork, photos and video.

I, _____, being the parent or guardian of the above-named minor, hereby consent to and join in the foregoing release and consent on behalf of said minor.

Pledge of Originality: I declare and avow that the poem(s) or art I am submitting to the River of Words Contest is my own original work.

Student's signature_____

PO Box 4000-J, Berkeley, CA 94704 USA
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http://www.riverofwords.org • Email: row@irn.org

9. In what ways did your school and/or your community support your students' participation in the project? (For example, financial help or invited speakers).

_____

_____

10. Did the project receive any local press coverage?_____If so, how did they find out about it? _____
(We would very much appreciate copies of any press coverage you received.)

11. Did you collaborate with teachers from other disciplines, grades, and/or other schools?____ What subjects did they teach? _____
How did this work? _____

12. Please describe projects or events that may have blossomed as a result of *River of Words.*

13. Which part of the curriculum did your students respond to most?

_____

14. Which classroom activities were:
    a. most useful_____
    b. least useful_____

15. Did you take field trips in conjunction with this project? _____
Where?_____

16.What classroom or field experiences/activities could you share with other educators?

17. Any comments, criticisms, and suggestions for the future of *River of Words*?

We hope that River of Words provided teaching and learning opportunities that heightened your students' sense of place and community.

Please mail to: River of Words Project, PO Box 4000-J, Berkeley, CA 94704
ROW Form 1010 2/5/97