Traditional Lifeways Curriculum:
ENVIRONMENTAL HEALTH IN RURAL COMMUNITIES: DRINKING WATER AND SANITATION

Upper Kuskokwim Region of Interior Alaska, K-12

Dina'ena tsaye ghinet tu hidinełghwts'
Jija huniya deno.

People are boiling water for tea
While they are picking berries

A Culturally-based Curriculum created by
Telida Traditional Council's
Indian General Assistance Program
Environmental Protection Agency

Curriculum and Teacher Resources available at **www.aknextgeneration.org**

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These education lessons are dedicated to the next generation to help protect our traditional way of life.

Dina'ena tsaye ghinet tu hidinełghwts'
jija huniya deno.

People are boiling water for tea
while they are picking berries.

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Upper Kuskokwim Region of Interior, Alaska, K-12
Drinking Water, Sanitation, and Environmental Issues in Rural Alaska Housing

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Alan Dick, Alaska Native Clipart

Foreword

Telida Village has developed a series of environmental health education that will keep the tribal members healthy and the environment clean for the future generations, fulfilling the Indian General Assistance Program's objective to reduce the risk to human health and the environment.

The "Drinking Water, Sanitation, and Environmental Issues in Rural Alaska Housing" education unit is composed of eight education lessons with a total of 50 activities. The community-based lessons focus on clean drinking water and safe housing and sanitation for people living in rural Alaska. Education activities include Elders working with students to examine and solve environmental problems in the local community.

The education lessons meet the Alaska State Content Standards and Alaska Standards for Culturally Responsive Schools. The activities in the lessons are based on "Translating Standards to Practice: A Teacher's Guide to Use and Assessment of the Alaska Science Standards" developed by the Alaska Rural Systemic Initiative and "The Handbook for Culturally Responsive Science Curriculum" by Sidney Stephens.

Curriculum Development Team

Charlene Dubay (Team Leader, Contributor) is the IGAP Environmental Director for Telida Traditional Council overseeing the development of the culturally-based Traditional Lifeways curriculum. Ms. Dubay has a Master's Degree in Cross-Cultural Studies from the University of Alaska Fairbanks and a Bachelor's of Science Degree in Wildlife Biology from the University of Massachusetts Amherst. Charlene has been integrating subsistence and language issues into preservation and outreach programs for over 20 years. She can be reached at charlenedubay@hotmail.com.

Steven Nikolai Sr. (Native Cultural Specialist) was born and raised in the Upper Kuskokwim region and is a First Speaker of Upper Kuskokwim Athabascan (UKA). Mr. Nikolai has taught bilingual classes at the Nikolai School in the Iditarod Area School District and is an experienced subsistence hunter, trapper and fisherman. Steven Sr. also worked with the Alaska Native Language Center. Steven Nikolai Sr. was Chief of the Telida Tribal Council for many years and has a heart for economic and social development as well as preserving traditional ways of living in the U.K. region. Steven provided UKA translations in the Series.

Teresa Hanson (Researcher, Contributor) holds a Masters Degree in Northern Studies and a Bachelors Degree in History from the University of Alaska Fairbanks. She currently consults curriculum development projects, as well as develops grant proposals for Alaskan cultural issues such as language preservation. Teresa homeschooled her four children and other small groups for over 15 years. Her Oral History collection Master's thesis: "Homeschooling in Alaska" interviews are housed in the Oral History collection in the UAF Archives at Rasmuson Library. If you would like contact her about curriculum development or other educational consulting services, she can be reached at teresaconsulting@hotmail.com.

Alan Dick, Alaska Native Clipart

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Indoor Air Information: CA/EPA Air Resources Board, Cold Climate Housing Research Center, and the University of Alaska Fairbanks Cooperative Extension Service, and Teresa Hanson with Tsidkenu Consulting.

Infectious Diseases Information: Alaska Division of Public Health, Alaska Department of Environmental Conservation, Alaska Native Tribal Health Consortium, Centers For Disease Control and Prevention, National Center for Zoonotic, Vector Borne, and Enteric Diseases and Prevention, and the State of Alaska Epidemiology Program.

Mold Information: Cold Climate Housing Research Center

Radon Information: John C. Hill, Richard Seifert with the University of Alaska Fairbanks Cooperative Extension Service, and the University of Alaska Fairbanks Cooperative Extension Service.

Rural Housing Information: Interior Regional Housing Authority, Denali National Park Service, and Teresa Hanson with Tsidkenu Consulting.

Safe Drinking Water Information: Alaskool, Alaska Department of Environmental Conservation, Cold Climate Housing Research Center, University of Alaska Fairbanks Cooperative Extension.

Sanitation Information: Alaskool, Cowboys and Indians Magazine, Joe Sarcone with the Agency for Toxic Substances and Disease Registry and Worker's Health Centre in Australia.
Water Quality Information: Alaska Department of Community and Economic Development, Alaska Department of Environmental Conservation, and Wilkes University Center for Environmental Quality Environmental Engineering and Earth Sciences.

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Introduction to Traditional Lifeways Curriculum Series

Alan Dick, Alaska Native Clipart

The wisdom of any culture lies not in the monuments constructed or the books written but rather within the skills it gives to its children for their continued survival.

When a community teaches co-operation, sharing and respect for the natural world it insures that the earth will continue to provide the necessities to nurture both the body and spirit of its people. From their earliest years the children of the Upper Kuskokwim Region are taught respect for land, water and the creatures of the earth.

Young children are encouraged to watch what others are doing. In this way they are learning what to do for themselves. They are being taught to be self-sufficient and when necessary to improvise with what is at hand. This ability to make independent decisions may someday be necessary for their own survival or that of another person.

Within the Upper Kuskokwim Region subsistence is necessary for day-to-day living. Hunting, trapping, fishing, gathering and gardening are crucial activities for the majority of the native population. (Sate of Alaska Community Website, McGrath, Takotna, Nikokai, and Telida.) Understanding rural issues such as sanitation, healthy drinking water and responsible solid management are necessary for the health of the environment and the individual.

The curriculum provided is not intended to replace the training of the elders but rather to provide a method which supports this training.

Pattern of Life (Collins, revised, 2004.)

"The people of the Upper Kuskokwim area developed a pattern of life that was determined to a large extent by their environment. There were no permanent, year-round villages in the past. People had to move seasonally to harvest food and would winter in different locations to keep from depleting the resources such as food, fur, and firewood in any given place. As with other Athabaskans who reside near the head of a river system surrounded by mountains, they share a number of environmental constraints.

The climate is that of the Alaskan Interior with cold winters and relatively warm summers. The boreal forest provides a number of micro-environments. Black spruce and moss lie over areas of frozen ground that requires a hot fire to clear and thaw, thus allowing willow and birch to move in. The thawed ground along the rivers is covered with stands of white spruce and birch on the higher cut bank side of the river, with thick stands of willow and alder on the sandbars. Cottonwood are found along the river and aspen on the higher ground. Cross-country travel is difficult in much of the lowland area because of numerous swamps and boggy areas drained by small streams that flow into the major rivers. The rivers are the main highways for travel both in summer and winter.

Food resources vary in type, quantity and habitat. Three species of salmon ascend the Kuskokwim streams: Chinook (King), Chum (Dog), and Coho (Silver). Whereas hundreds of thousands, and even millions, of salmon enter the Kuskokwim River, but by the time they reach the headwaters only a few thousand or even a few hundred are left to spawn in any given stream.

Until the late 1800's and early 1900's moose were absent in most of the area. The large animals most harvested were Dall sheep, caribou, Black bear and Grizzly bear. Dall sheep habitat is limited to the Alaska Range. Caribou also spend much of the year in the mountains, moving down to the lowlands primarily during the winter. Today, moose is widely hunted.

Small game species such as rabbits, grouse and ptarmigan are widely dispersed but their populations are cyclic and in some years they are very scarce.

Ducks and geese pass through the area by the thousands in the spring when the headwaters of the rivers first open, but most move on to nest elsewhere. During the fall migration, when there is plenty of open water, most fly over the area without stopping except for a brief rest.

Yearly Cycle of Subsistence Activities (Collins, revised. 2004)

"A yearly cycle in one of these territories might begin with relocating to a fishing site in the late spring to take advantage of the fish runs that began moving upriver at breakup.

The original method for catching these fish was by constructing a fence and wire in a shallow side stream that was utilized for spawning. They were more difficult to catch in the main Kuskokwim River until the fishwheel was introduced in the 1900’s, and large twine and nylon fish nets became available.

Nikolai and Telida were suitable sites for winter villages. Other sites that were used at times included East Fork, Big River and Vinasale. During the winter some families dispersed to trapline cabins. As trade goods and industry such as mining became more available at McGrath, Takotna and Medora, trapping began to play a bigger role in the yearly cycle.

ALASKA STANDARDS

Source of Information: Alaska Standards for Culturally Responsive Schools
The following standards are excerpts from the Alaska Cultural and State Content Standards.

Cultural Standards

A. **Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community.**

Students who meet this cultural standard are able to:

1. assume responsibility for their role in relation to the wellbeing of the cultural community and their life-long obligations as a community member;
2. recount their own genealogy and family history;
3. acquire and pass on the traditions of their community through oral and written history;
4. practice their traditional responsibilities to the surrounding environment;
5. reflect through their own actions the critical role that the local heritage language plays in fostering a sense of who they are and how they understand the world around them;
6. live a life in accordance with the cultural values and traditions of the local community and integrate them into their everyday behavior.

B. **Culturally knowledgeable students are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life.**

Students who meet this cultural standard are able to:

1. acquire insights from other cultures without diminishing the integrity of their own.
2. make effective use of the knowledge, skills and ways of knowing from

their own cultural traditions to learn about the larger world in which they live.
3. make appropriate choices regarding the long-term consequences of their actions.
4. identify appropriate forms of technology and anticipate the consequences of their use for improving the quality of life in the community.

C. **Culturally knowledgeable students are able to actively participate in various cultural environments.**

Students who meet this cultural standard are able to:

1. perform subsistence activities in ways that are appropriate to local cultural traditions;
2. make constructive contributions to the governance of their community and the well-being of their family;
3. attain a healthy lifestyle through which they are able to maintain their own social, emotional, physical, intellectual and spiritual well-being;
4. enter into and function effectively in a variety of cultural settings.

D. **Culturally knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.**

Students who meet this cultural standard are able to:

1. acquire in-depth cultural knowledge through active participation and meaningful interaction with Elders.
2. participate in and make constructive contributions to the learning activities associated with a traditional camp environment.
3. interact with Elders in a loving and respectful way that demonstrates an appreciation of their role as culture-bearers and educators in their community.
4. gather oral and written history information from the local community and provide an appropriate interpretation of its cultural meaning and significance.
5. identify and utilize appropriate sources of cultural knowledge to find solutions to everyday problems.
6. engage in a realistic self-assessment to identify strengths and needs and make appropriate decisions to enhance life skills.

E. **Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.**

Students who meet this cultural standard are able to:

1. recognize and build upon the inter-relationships that exist among the spiritual, natural and human realms in the world around them, as reflected in their own cultural traditions and beliefs as well as those of others;
2. understand the ecology and geography of the bioregion they inhabit;

Science Standards:

A. **Science as Inquiry and Process – A student should understand and be able to apply the processes and applications of scientific inquiry.**

A student who meets the content standard should:

3. develop an understanding that culture, local knowledge, history, and interaction with the environment contribute to the development of scientific knowledge, and local applications provide opportunity for understanding scientific concepts and global issues.

B. **Concepts of Physical Science – A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world.**

A student who meets the content standard should:

2. develop an understanding that energy appears in different forms, can be transformed from one form to another, can be transferred or moved from one place or system to another, may be unavailable for use, and is ultimately conserved;
3. develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems; and
4. develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.

C. **Concepts of Life Science – A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science.**

A student who meets the content standard should:

2. develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms; and
3. develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.

E. **Science and Technology – A student should understand the relationships among science, technology, and society**.

A student who meets the content standard should:

2. develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits; and
3. develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures.

F. **Cultural, Social, Personal Perspectives and Science – A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives.**

A student who meets the content standard should:

2. develop an understanding that some individuals, cultures, and societies use other beliefs and methods in addition to scientific methods to describe and understand the world; and
3. develop an understanding of the importance of recording and validating cultural knowledge.

G. **History and Nature of Science – A student should understand the history and nature of science.**

A student who meets the content standard should:

1. develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge;
4. develop an understanding that advancements in science depend on curiosity, creativity, imagination, and a broad knowledge base.

Math Standards:

A. **A student should understand mathematical facts, concepts, principles, and theories.**

A student who meets the content standard should:

1. understand and use numeration, including:

    a. numbers, number systems, counting numbers, whole numbers, integers, fractions, decimals, and percents; and
    b. irrationals and complex numbers;

2. select and use appropriate systems, units, and tools of measurement, including estimation;

3. perform basic arithmetic functions, make reasoned estimates, and select and use appropriate methods or tools for computation or estimation including mental arithmetic, paper and pencil, a calculator, and a computer;

4. represent, analyze, and use mathematical patterns, relations, and functions using methods such as tables, equations, and graphs;
5. construct, draw, measure, transform, compare, visualize, classify, and analyze the relationships among geometric figures; and
6. collect, organize, analyze, interpret, represent, and formulate questions about data and make reasonable and useful predictions about the certainty, uncertainty, or impossibility of an event.

B. **A student should understand and be able to select and use a variety of problem solving strategies.**

A student who meets the content standard should:

1. use computational methods and appropriate technology as problem-solving tools;
2. use problem solving to investigate and understand mathematical content;
3. formulate mathematical problems that arise from everyday situations;
4. develop and apply strategies to solve a variety of problems;
5. check the results against mathematical rules;
6. use common sense to help interpret results;
7. apply what was learned to new situations; and
8. use mathematics with confidence.

E. **A student should be able to apply mathematical concepts and processes to situations within and outside of school.**

A student who meets the content standard should:

1. explore problems and describe results using graphical, numerical, physical, algebraic, and verbal mathematical models or representations;
2. use mathematics in daily life; and
3. use mathematics in other curriculum areas.

Assessment:

- Log books
- Surveys
- Graphs
- Number of Elders included
- Number of Investigative walks around the community
- Number of new project needs identified in the community

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Skills and Knowledge

Drinking Water

The students will:

- Know how to listen and work with Elders to gather information that will help to solve environmental health problems with drinking water in the community.
- Be able to identify the different sources of drinking water that people use in the community.
- Know how to trace the water cycle from the beginning to the end in the community as the people use the water and then dispose of it.
- Be able to identify sources that can pollute the community's drinking water.
- Understand how bacteria, viruses and protozoa can contaminate the community's drinking water.
- Know about the diseases that people can catch from contaminated water and what they can do to prevent the water from becoming contaminated.
- Understand how to evaluate roofs for collecting drinking and cooking water.
- Understand how to make a roof safe for collecting cooking and drinking water.
- Know how to purify the family's drinking water.

Sanitation

The students will:

- Know how to listen and work with Elders to gather information that will help solve environmental health problems with sanitation in the community.
- Understand about the waste disposal system in the community.
- Know what a disease is and how the immune system works to help prevent disease.
- Know the diseases that the community is at risk for from sanitation and how to protect themselves against the diseases.
- Understand what the risks are to the community if the river floods.
- Know how much clean water a family should store in case of emergency.
- Understand how the family needs to handle food, water, sewage, and fuel/oil/hazardous substance spills after a flood.
- Know how to safely work with bleach when sanitizing.

Environmental Issues in Rural Housing: Wood Smoke, Mold, and Radon

The students will:

- Know how to listen and work with Elders to gather information that will help solve environmental issues in rural housing in the community.
- Know the history of rural housing for the area.

- Be able to evaluate how the type of house a person lives in impacts human health and the environment.
- Know how to build a fire that gives off the least amount of wood smoke.
- Be able to recognize the symptoms of carbon monoxide poisoning.
- Understand how particulate matter and toxins from wood smoke impact human health and the environment.
- Be able to assess the type of wood stoves/boiler that are in people's homes in the community.
- Know how to research the new wood burning technologies to find out how economical they would be to buy and install in homes.
- Be able to survey their homes for mold.
- Understand how to reduce the moisture in their home so that mold will not grow in it.
- Know how to safely clean up mold in their homes.
- Understand how radon impacts people's health in the community.
- Know how to test for radon in the home and the school and what to do if the radon results are high.

Elders in the Classroom

by Roby Littlefield

“All students can benefit from inter-generational contracts. In Alaska Native cultures, grandparents were held in high regard as they contributed to the community by passing on knowledge and skills. Children learned by listening to and watching Elders and often didn't realize they were in training. Bringing grandparents in to share personal knowledge when studying subjects like nutrition, customs, plants, biology, and history can benefit the entire class.

To get started, first look to your class members. Send home a note or survey expressing your desire to include parents, grandparents, and Elders in your lessons. Get referrals for possible speakers from organizations that work with Natives and/or the Elderly.

The way to ask Native American Elders for help is different from Western customs. Initial and subsequent contact should be subtle. Visit with them, allowing time for the conversation to wander. Allow for extended pauses, giving them time to think and decide. If their hearing is poor, sit on the side of their better ear and make sure your lips can be seen. Direct eye contact should be limited. Standing or sitting at an angle can increase an Elder's comfort level. Keep your questions basic and specific.

Begin the request by telling a little story about your class and how the Elder could help. If you are not sure if the Elder is interested, hint strongly that you would like to have their help and ask if she or he knows of someone who might be willing to participate. Custom teaches that it is rude to give someone a frank "no" to a request for help, so you need to recognize that a noncommittal response might mean "no," or it might mean that the request is being considered. If at some point the Elder changes the subject more than once while you are explaining your request, you should be aware that she or he might be trying to say "no." Don't force a response; if it is clearly not a "yes," let it go, or suggest they can contact you after they've thought about it.
It is important to ask before a meeting for permission to make audio or video recordings. Don't show up with the equipment; you may force consent and cause bad feelings. Permission to listen to or tape a story or lecture does not give you any right to rebroadcast or write the story with you as author.

If an Elder has agreed to participate in a classroom, suggest an activity or topic outline so they know what you are expecting. Provide them with optional dates and the logistics. It is helpful to explain the routine, consequences for students' misbehavior, and possible options if problems come up during the lesson. It is your responsibility to ensure discipline is maintained. Be aware, however, that Elders generally do not support strict discipline in a public setting. Discuss how to make a smooth transition to help the Elder leave the class. Agree on some visual signs and ground rules.

When the Elder arrives, properly introduce her or him so the Elder under stands your respect for them. The teacher should be alert for visual cues from the Elder during the

visit and be prepared to give unspoken signals back. The teacher should stay in the room.

Give the Elder a chance to use traditional discipline. Be prepared to move a child to sit by an adult who can role model how to listen respectfully. If you have problems with students degrading or ignoring an Elder, have a teacher's aide or adult Native quietly intervene.

Most traditional stories are like a round, crocheted pot holder. The story teller goes round and round the subject until it all comes together and finally comes to the lesson or point. Be patient; allow the Elders to share their culture in their own way. Your students are learning how to listen. Students should refrain from interrupting to ask questions. There will be a proper time to ask questions.

As a thank-you, Elders usually appreciate students and teacher letters, pictures, and story booklets, which are treasured and shown to friends and relatives. This may also encourage other Elders to participate in classroom projects.

Sometimes you will find a resource person who is available for a wide variety of subjects and projects. If you use an Elder more than once, the school should provide some type of stipend in appreciation of the energy and knowledge the Elder is contributing. Be careful not to burn out your Elders. Whenever you make a request, be sure the Elder understands she is not obligated.

Keep your lessons flexible in case the Elder can't come at the last minute. Once an Elder has agreed on a time to come into your classroom, avoid changing or postponing the visit." (Littlefield, 1999)