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A CURRICULUM GUIDE FOR THE INCLUSION OF ECOPSYCHOLOGY IN AN ALTERNATIVE EDUCATION SETTING

A Project Report

Presented to

The Graduate Faculty

Central Washington University

In Partial Fulfillment
of the Requirements of the Degree
Master of Arts
Education

by Sara LeRoux July 2010

ABSTRACT

A CURRICULUM GUIDE FOR THE INCLUSION OF ECOPSYCHOLOGY IN AN ALTERNATIVE EDUCATION SETTING

By

Sara LeRoux

July 2010

Ecopsychology is a relatively new field. It is a hybrid of environmentalism and psychology. The study of ecopsychology and nature awareness emphasizes that people, chiefly children, need nature in order to maintain brain health. This study examines the impact that nature has on humans, and focuses on the positive impact nature has on students with ADHD, ADD, autism, learning disabilities, students at-risk, and students at large. The author lobbies for a paradigm shift in traditional curriculum to accept and honor the extensive potential for students' emotional and psychical health. The proposed project focuses on creating approaches to integrate and implement ecopsychology sensitive curriculum into high school alternative education classrooms in Washington State. Adoption of such concepts and practices in alternative school settings are discussed.

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CHAPTER I

A Curriculum Guide for the Inclusion of Ecopsychology in an Alternative Education Setting

INTRODUCTION

This document is intended to serve as a model and resource for high school educators teaching in an alternative school setting that wish to incorporate ecopsychology in their classroom. A chief assertion of this manuscript is that there is a positive correlation between youth behavior, mental health and their interaction with nature. A review of the related literature and research is presented in this document, in addition to a discussion of the rationale supporting this position.

Justification of Project

This document will propose a method to help re-engage the at-risk student in schools based upon current research, modern curriculum models and best practices. In doing so, this curriculum guide will be another tool in the arsenal to help combat the high levels of high school dropouts and target students in alternative education settings.

The dilemma of students dropping out before earning their high school diploma is hardly a current trend. And, every president for decades has pledged to help bridge the achievement gap in schools and increase the numbers of educated young adults – yet, the dropout trend is continuing. In fact, just last year, President Barak Obama made an address to a joint session of Congress

discussing the plight of schools and the national problem of high school drop outs. In this speech, President Obama calls for a "'national effort to turn around America's persistently low-performing schools' and to reduce the number of students – 7,000 each school day, or 1.2 million each year – who drop out," (Sweet 2010). In fact, a leading state in this trend is California, in which the California Department of Education states that "one of every four students drops out before finishing high school," (Iverson 2008). Obama's administration is looking at strategies "to keep students from dropping out and to steer them toward college, including financing for alternative high schools," (Sweet 2010). The inclusion of ecopsychology in alternative school settings could be the new strategy.

The value of ecopsychology is derived by its ability to influence brain and emotional health which in turns positively effects behaviorally and emotionally troubled youth. Alternative schools and programs that have a firm foundation in nature therapy and the inclusion of nature in curriculum show dramatic positive outcomes for students that participate in such schools and programs. One such therapeutic treatment center, Bryn Melyn Community, concludes after a detailed analysis of its program that "adventure-based intervention in the form that we use it, works. It is effective. It helps to change behavior; it alters attitudes and changes values. It is also relatively cheap. It is healthy and it engages young people where other approaches have failed," (McNutt 1994). It is these types of promising programs that bolster the argument that nature and behavior can harbor a direct correlation.

Scope of the Project

This project is intended as a curriculum guide for the inclusion of ecopsychology in an alternative education setting. It is written under the assumption that educators working in alternative school settings with high school students have some flexibility and privileges in terms of curricula used and methods of implementation.

Chapter Two presents the review of the related literature relating to ecopsychology and students at-risk as a rationale for the need to develop a meaningful curriculum guide to help bridge the gap between the classroom and the creek. Chapter Three exemplifies the setting and steps involved in the progression of this project and outlines the context in which the author developed the curriculum guide. Chapter Four presents a guide for teachers to implement curriculum with a foundation in ecopsychology and includes a sample of such lessons. The guide is designed for educators of high school students in an alternative education setting; however, with some modification, the curriculum guide may be altered for younger or older students in public schools. The curriculum guide was intended so that educators using it might gain insight in the field of ecopsychology and expand their repertoire in implementing curriculum with such an underpinning. Chapter Five summarizes the project and discusses the connection between Chapter Two and Chapter Four.

Definitions of Terms

Attention Deficit Disorder (ADD):

This is a disorder usually associated with children, but has been known to be presents in adults. Attention Deficit Disorder, commonly called ADD, is characterized by a difficulty maintaining focused on tasks, especially for long periods of time. This disorder is frequently treated with the drug therapy Ritalin, which works by stimulating the attention-focusing structures of the brain.

Attention Deficit Hyperactivity Disorder (ADHD):

Although no longer in technical use, the origin of Attention Deficit Hyperactivity Disorder (ADHD) dates from the mid 1980's. Like ADD, ADHD is a condition usually found in children with the marked difference of hyperactivity and impulsiveness as symptoms. These symptoms often interfere with social interactions, as well as academic and occupational performances.

Alternative Education:

A form of education that is different from the mainstream or traditional education in its approach to teaching and learning. Not only that, alternative education typically hold deep roots in various philosophies and covet their small class sizes, sense of community, and close relationship between students and teachers.

At-Risk Youth:

The term at-risk youth can encompass a plethora of individuals. For this study, at-risk youth are students in the mainstream, traditional educational systems that are unsuccessful for any number of reasons and risk fail or dropping out of high school. Drug and alcohol abuse, teen pregnancy, emotional and behavioral

problems, poverty, criminal activity, and unstable home lives are typically the catalyst for students to be labeled as at-risk.

Attention Restoration Theory (ART):

This theory suggests that after looking at scenes of nature, or spending time in nature, people are able to concentrate better on task and reduce stress levels.

Cognitive Revolution: Named for an intellectual movement in the 1950s, the Cognitive Revolution began what are known collectively as the cognitive sciences. It began in the modern context of greater interdisciplinary communication and research. The Cognitive Revolution in psychology was a response to Behaviorism, which was the predominate school in experimental psychology at the time. This school was heavily influenced by Ivan Pavlov, B.F. Skinner, and other psychologists.

Cultural Autism:

This newly coined term describes children that lack time and experiences in nature. Symptoms of cultural autism are perpetuated through a continual lack of exposure to nature and the increase of physically detached human relationships. Ecopsychology:

This is the connection and intertwining of psychology and ecology. The essential idea of ecopsychology is that the human mind is inspired and comforted by the natural world, although our minds are now shaped by the modern social world. This inspiration and comfort develops because the natural world is the one in which humans originally evolved.

Integrated Thematic Instruction Model: Thematic learning is based on the idea that knowledge acquisition is efficient among students when they learn in the context of a coherent and holistic way and when they can associate whatever they learn to their surrounding and real life examples. Thematic instruction seeks to put the cognitive skills such as reading, thinking, memorizing, and writing in the context of a real life situation under the broad aim to allow creative exploration.

Nature Deficit Disorder:

Simply put, Nature Deficit Disorder claims that children are spending more time indoors and therefore less time outdoors. This change in behavior over the generations is credited for triggering a trend resulting in a wide range of behavioral problems due to the lack of interaction with nature and the outdoors.

Nature Therapy:

A therapeutic model that is carried out in nature where the philosophy is that the natural elements support the therapeutic process which can help a person's physical, emotional, and mental well-being.

CHAPTER II

A REVIEW OF THE RELATED LITERATURE

Ecopsychology connects ecology and psychology. A pioneer in the research of ecopsychology, and the man that coined the term in 1992, is Theodore Roszak. The fundamental definition of ecopsychology is used, "to describe the shift from unstructured play time outdoors to highly regimented play, often indoors or with electronics. The result is that children don't have any connection with their natural environment, and according to Richard Louv in his book published in 2005, Last Child in the Woods: Saving Our Children from Nature Deficit Disorder, he claims this lack of nature increases the occurrence and severity of disorders such as ADD and other behavioral and emotional disorders," (SuperGreenMe, 2008). Rather than focusing on how humans impact nature, ecopsychology focuses on how nature impacts human behavior and emotions. Through this review of the literature, there is ample and influential evidence to support the hypothesis that emotional and behavioral problems in atrisk youths can be directly linked to nature-deficit. The term nature-deficit was conceived by Louv; he claims that there is a trend in which children are spending less time outdoors, resulting in a wide range of behavioral problems. Although some critics argue that in the minds of many, "ecopsychology is... synonymous with new age pseudo-science and the alternative environmental and therapeutic fringe," as well as having "a substantial credibility gap," (Reser 1995). However, there is considerable research to the contrary.

To further this point, a controversial study was conducted by Carnegie Mellon University in 1998 and found that "people who spend even a few hours on the Internet each week suffer higher levels of depression and loneliness than people who use the Net infrequently," (Louv 2005, pg 65). Although Roszak and Louv can be credited for coining now common verbiage in this field, other research and studies, which will discussed further, have been compiled to support their original theories. Another explanation of ecopsychology argues that, "at its most ambitious, ecopsychology seeks to redefine sanity within an environmental context." Furthermore, "ecopsychology brings together the sensitivity of therapists, the expertise of ecologists, and the ethical energy of environmental activists," (Lester 1995).

Ecopsychology has promising effects on at-risk youth. This is exciting because at-risk youth are arguably the hardest population to educate and positively influence in the educational field. Often times, these students are dealing with drug, alcohol and other dependencies as well as dealing with a troubled home and social lives. Education with an ecopsychology focus has proved to be one of the most powerful tools in treating and educating these students. Individuals in an alternative educational setting are at an advantage in terms of the school's flexibility and openness to new types of treatment and education. Unlike public schools, private schools do not have as much 'red tape' to deal with funding programs, hiring educators and para-educators, implementing discipline, and governmental restrictions on curriculum, testing etc.

Due to these liberties and freedoms, some wonderful and positively powerful programs have been developed and implemented to help at-risk youth.

As society becomes more technologically dependent, each generation is showing more signs of both nature-deficit and cultural autism. (Cultural autism is seen as a disorder that affects children that lack time and experience in nature.) To further stress, students in the educational system are showing these signs and behavioral problems, including an alarming trend in the diagnoses of ADD and ADHD. Although there is evidence that students can benefit from exposure to nature and a curriculum founded in the ideology of ecopsychology, it is perhaps most effective with at-risk youth in an alternative educational setting due to the flexibility and freedom to craft lessons outside the classroom walls.

Society & Nature

In 1964, the Wilderness Act was written and signed into law by President Lyndon B. Johnson (Nash, 2001). This act was passed a full decade before the Endangered Species Act, and is a foundation for all environmental laws and regulations that follow; "wilderness is perceived in the US as unique and fascinating, and wilderness areas have been legally protected since the Wilderness Act" (Bauer, Wallner, Hunziker 2009). However, not all countries have found this connection with nature. For example, when conducting a study to determine how to go about protecting nature and rewild their country, the traditional notion in Switzerland about nature is that it is "hostile and dangerous" and therefore, the desire to maintain their wild places was not an urgent one (Bauer, Wallner, Hunziker 2009). It seems that these counties, however, are

slowly realizing that they need to make conscious efforts in order to maintain their wild spaces for the benefit of their citizens.

In order to explain a society's intentional decision to stay out of, and avoid contact with nature, a professor of psychology at the University of Washington, Peter H. Kahn, in conjunction with colleagues, conducted five collaborative studies to research the "sense of children's environmental moral reasoning," (Kahn 2001). The first three studies involved a black population in Houston, one of which was economically impoverished. These studies focused on interviewing students and parents of these students. The last two studies involved interviewing Brazilian children in both the rural and urban parts of the Amazon Jungle (Kahn 2001). Thru their research of different cultures and populations, these studies concluded that:

Thus our quantitative and qualitative cross-cultural results support the proposition that there are universal features in children's conceptions and values of the natural environment. If true, the reason may be that inherent aspects of nature itself help give rise to children's environmental constructions. In this way, nature is not a mere cultural convention or cultural artifact, as some postmodern theorists suggest. Rather, nature is part of a reality that not only has shaped our evolutionary history but form a developmental perspective bounds children's cognition. (Kahn 2001)

Kahn's research uncovered the interesting facts that children and parents in Houston consciously avoid going outside into nature due to their dangerous neighborhoods and pollution. One would argue that this mindset is due to their impoverished living conditions; "it is not so much that parents and their children wanted to avoid nature (even in terms of just playing in the backyard or sitting outside), but that the noxious

pollution and potential for violence within their community made such experiences difficult," (Peter, Friedman 1996). This sentiment seems only to solidify the echo of truth spoken over 20 years ago, that "the African American communities in Houston have remained largely invisible to politicians, researchers, and environmentalists alike, locally (in Houston) and nationally," (Bullard 1987). Unarguably, there are many communities sprinkled acrossed the country that have the same feelings about nature as the subjects in the Houston studies. These communities seem to know the importance of nature and wish they could have their kids play outside without fear of pollution or violence, but as of yet, these problems have yet to be remedied. This research identifies another societal factor that increases the nature-deficit in children.

At - Risk Youth

Typically, students that are labeled at-risk are those that appear to come from an unstable family life and perhaps engage in drug use and sexual intercourse (Mann 1986). Teachers describe these students as unengaged in the classroom and usually lack respect for authority. Even though decades ago, Dale Man, an author and researcher dealing with youth at-risk, says "there does not at this time appear to be a good definition or even description of who these youth are," (Mann 1986), this sentiment can be used today. There may not be a clear and defined definition of these students, but there are definitely demographic, socioeconomic, and institutional characteristics that correlate with students' likelihood of dropping out of school. These characteristics include: "...living in

high-growth states, living in unstable school districts, being a member of a lowincome family, speaking English as a second language, being single-parent children, having negative self-perceptions, having parents who are not high school graduates, being bored or alienated, and having low self-esteem," (Butler, Druian 1986). These characteristics are commonly associated with minority groups. "An estimated 30 percent of U.S. high school students drop out or fail to graduate," of these drop-outs, the rate of dropping out for black students is closer to 50 percent (America's Promise Alliance, 2008). In fact, not only are blacks at risk from these high drop-out rates, students from "some minority groups only have a 50-50 chance of earning a high school diploma (Swanson, 2003). These rates of drop-out only feed the perpetual cycle of students starting school at or predisposed to the risk of dropping out. For example, "high school dropouts earn \$250,000 less on average over a lifetime less than graduates," (U.S. Bureau of the Census, 2006). Why is this important? Earning less money means that children of drop-outs have a higher chance of being raised in poverty, which can be seen as a precursor for these children to drop out as well. It is possible for parents to pass their school failures onto their children; "students from impoverished households with undereducated parents are themselves more likely to drop out," (Ransel 2010). Students at-risk need supportive learning communities and individual instruction. Minority groups are often located in urban settings, and it is these settings that can also hinder their academic life. City life often leads to higher populations in schools, and therefore larger districts and larger schools. It is these schools that are another obstacle for minority students;

"extensive research evidence indicates that a supportive climate for learning can be severely damaged by the very large secondary schools that are typical of the major urban and suburban districts where many minority and low-SES students are enrolled," (Legters, McDill 1994). Although the research presented indicates that youth living in large urban areas reflect higher levels of nature deficit, all students can benefit from increased interaction with nature and schooling targeting the inclusion of ecopsychology.

Emotional & Behavioral Problems

There is abundant and significant evidence that supports the hypotheses that at-risk youths in an alternative educational setting are positively impacted by activities and lessons built from the ecopsychology ideology. One large scale study that was done with Outdoor Behavioral Healthcare Research Cooperative in conjunction with University of Idaho-Wilderness Research Center, studied over 800 at-risk clients. The study "indicates that participation in OBH [Outdoor Behavioral Healthcare] led to important reductions in the severity of behavioral and emotional symptoms, as perceived by the clients themselves, and even more so by their parents," (Russell 2001). Moreover, "two categories of outcomes are consistently reported in the literature from participation in wilderness and outdoor treatment programs: a) enhanced self-concept, and b) the development of appropriate and adaptive social skills," (Russell 2001). Stress is another noted factor in behavioral issues. The amount of stress a child or youth faces and deals with can almost be directly correlated with the

environmental setting in which they live and spend their time. Research has shown that nature promotes attention in an involuntary manner, this action eases stress by what is called a rest-producing experience (Gifford, 1995). When students engage in nature, their stress levels diminish and they are able to focus on tasks at hand and control impulsive behaviors.

In 2003, environmental psychologists at Cornell University conducted a study in which their findings indicated that children that had a room with a view of nature dealt with stress better than children that did not. Furthermore, nature in or around the home was significant in protecting the "psychological well-being of children in rural areas," (Louv 2005). The idea of stress management in children is critical due to the alarming number of children and young people that have been diagnosed with depression in the last decade. Additionally, rooms with a view do not only help children, "elderly adults tend to live longer if their homes are near a park or other green space, regardless of their social or economic status. College students do better on cognitive tests when their dorm windows view natural setting... Residents of public housing complexes report better family interactions when they live near trees," (Science Suggests Access to Nature is Essential to Human Health, 2009). Louv states that there is new evidence supporting the idea that the increase in medication for antidepressants and attention disorders is amplified by a child's disconnection from nature. Research has been conducted to support Louv's theory. One such researcher is Frances Kuo, a professor of natural resources and environmental science and psychology at the University of Illinois. In her 2001 study, Kou and her colleagues "asked

parents of children with ADHD which after-school activities worsened – and which soothed – their children's symptoms. The parents consistently reported that outdoor activities in natural settings lessened their children's ADHD symptoms more than activities conducted indoors, or in built environments outdoors," (Science Suggests Access to Nature is Essential to Human Health, 2009). Furthermore, a colleague of Kou and an Illinois postdoctoral researcher, Andrea Faber Taylor, "studied children with ADHD who went on field trips in green or manmade environments. After the trips, other researchers (who did not know where the kids had been) tested their concentration. Children with ADHD had significantly better concentration after a walk in the park than in an urban setting," (Science Suggests Access to Nature is Essential to Human Health, 2009). The amazing aspect of this study is that the difference in the childrens' concentration and behavior was comparable to the results of using standard ADHD medication.

Another theory that aims at explaining the importance of natural settings and the behavioral changes in urban settings is called Attention Restoration Theory, or ART. This theory is based on the fact that natural settings do not require the same amount of cognitive effort as urban settings, (Lehrer 2009). Because cities are brimming with stimuli, one is "constantly redirect[ing] attention" as to not be distracted by items of irrelevance, such as signs, sounds of cars, neon signs, etc. (Lehrer 2009). ART helps to further explain why children with symptoms of ADHD show fewer signs, if any, in natural settings and are able to focus on a given task. Interestingly enough, the impact of nature on people's

moods is not something new, but often gets overlooked or explained using other factors. For example, the American Psychiatric Association claims that in a court of law insurance companies can only be billed for one instance where nature impacts human neurosis, 'seasonal affective disorder.' This disorder is characterized by "a depressive mood swing occasioned by gloomy weather," (Roszak 1995) However, this seasonal affective disorder is trumped when it correlated with seasonal unemployment, when this occurs, "the economic factor then takes precedence over the seasonal phenomenon," (Roszak 1995).

Although it might not appear as such an issue, this is another example where people who believe that nature does not impact the mental and physical wellbeing of individuals use other factors to explain one's mood – and nature is not that factor.

Nature Deficit

Although he coined the term, Richard Louv is careful to explain that nature-deficit disorder "is not a medical diagnosis, but a description of the growing gap between human beings and nature, with implications for health and well-being," (Louv 2009). Behavioral problems and detachment are symptoms of cultural autism and cultural autism is a symptom of a larger and all-encompassing problem: nature deficit. Society has quickly become one that is mass media influenced and technology dependant. The chasm between person and nature has increased in this modern society and the human relationship has quickly devolved into an impersonal dialogue through any number of communicative technology devices. A noted alternative education philosopher,

Ron Miller, states that mass media and so-called free market has impacted modern worldviews from "local, traditional, earth-rooted cultures with an abstract national identity that in recent years has been further abstracted by globalization." Furthermore, Miller claims that "human relationships become 'abstract' when they are conditioned by distant impersonal forces," such as said free market and mass media (Miller 2005).

Frances Kou, as introduced in the previous section, attempts to explain these behavioral phenomena in humans. Kou explains that scientists are not looking at humans in the same way that they study animals in the wild and their adaptation to changing habitats on these species. Humans are now that species. Once living in towns and in rural areas, human societies are becoming more urban. The human habitat, which is the environment, is changing and so will behavior. In fact, Kou explains that, "humans living in landscapes that lack trees or other natural features undergo patterns of social, psychological and physical breakdown that are strikingly similar to those observed in other animals that have been deprived of their natural habitat," (Science Suggests Access to Nature is Essential to Human Health, 2009). Kou continues saying that some symptoms of this nature deprivation are "increased aggression... disrupted parenting patterns, [and] social hierarchies are disrupted."

Alternative Education

Alternative education is an old field becoming rejuvenated. A new focus on alternative education is the emphasis of ecopsychology and its positive impact on students in an alternative educational setting. All of these newly implemented

terms have strengthened the foundation for the argument that ecopsychology can positively influence students, particularly, students in an alternative educational setting. Although there is significant research being conducted presently, "outdoor educators have explored the therapeutic uses of camping, expeditions, and challenge courses since the 1930s," (Berman, Davis-Berman 2005). Furthermore, early attempts of using "out-of-doors as a healing environment took place in the 'tent therapy' programs at state hospitals during the early 1900s," (Berman, Davis-Berman 2005).

An example of a successful alternative school in practice is Summit Preparatory School (Summit) located on the outskirts of Kalispell, Montana. Summit is "an accredited private non-profit therapeutic boarding school specializing in compassionate, relationship-based treatment of bright, capable high school age youth who are struggling in their current academic and/or home community due to emotional, academic and behavioral concerns," ("Introduction Summit Prep." n.d.). Summit's student body consists of at-risk youth with moderate to severe emotional and behavioral issues which negatively impact both their academic and personal lives. Due to this combination, Summit incorporates college preparatory academics and professional therapy. Students at Summit are plucked from their familiar surroundings and are placed on Summit's campus which consists of a secluded 500 acres. The campus location lends itself to easy access to nature and opportunities for hiking, rafting, skiing, fishing, camping, horseback riding, snowshoeing, and other outdoor activities. During semester breaks, students participate in week-long hiking and camping

trips with counselors to work on team-building skills in a natural and neutral setting. The school runs year round and is broken into four semesters. Each student is enrolled in three academic subjects per semester. Classes are divided into subject matter rather than grade level with the average class size of 10-14 students. Parents receive a weekly update on their student's progress via e-mail, which includes student progress, achievements, struggles, etc. ("Education Philosophy," n.d.). Summit is able to incorporate both the natural world and rigorous academic standards to educate and encourage these at-risk students to grow and thrive.

Curriculum & Assessment

As discussed above, the research indicates a positive trend and direct correlation between the physical and mental wellbeing of youth and students and their connection and interaction with nature. Now, schooling and education must be introduced into the equation. Jerome Bruner was "not merely one of the foremost educational thinkers of the era; he is also an inspired learner and teacher," (Gardner 2001: 94). Often labeled as a founding father and key figure in such psychological revelation as the 'cognitive revolution,' Bruner penned such works as *The Process of Education* (1960) and *Towards a Theory of Instruction* (1966). Furthermore, Bruner became immortalized in the education circle for his work on the social studies program *Man: A Course of Study*, which, "in the mid-1960s [became] a landmark in curriculum development (Smith 2002). However, it was not until the late 1990s that Bruner wrote *The Cultural of Education* (1996) in

which arguments dealing with cognitive revolution were developed with respects to education and schooling. Bruner believed that, "What we resolve to do in school only makes sense when considered in the broader context of what the society intends to accomplish through its educational investment in the young. How one conceives of education, we have finally come to recognize, is a function of how one conceives of culture..." (Bruner 1996: ix-x). From this realization, the concept of spiral curriculum was born. The notion that "...any subject can be taught effectively in some intellectually honest form to any child at any state of development," (Bruner 1960: 33) underpins the core ideas of spiral curriculum, which are, "a curriculum as it develops should revisit this basic ideas repeatedly, building upon them until the student has grasped the full formal apparatus that goes with them," (Bruner 1960: 13). Furthermore, four key themes develop around *The Process of Education*, which are:

 The role of structure in the learning and how it may be made central in teaching

For this theme, Bruner talks about the importance of learning structure, not just facts and techniques. He argues that, "If earlier learning is to render later learning easier, it must do so by providing a general picture in terms of which the relations between things encountered earlier and later are made as clear as possible," (Bruner 1960).

2. Readiness for learning

Some believe that schools have wasted time by not teaching children important subjects and areas because they are deemed too challenging and/or complex.

This is where Bruner's spiral curriculum disputes the fact that children cannot learn difficult topics/skills.

3. Intuitive and analytical thinking

Bruner notes that experts in different fields appear "to leap intuitively into a decision or to a solution to a problem," (Bruner 1960). He later studies how schools and teacher can create conditions for intuition to thrive.

4. Motives for learning

Motivating students to learn knowledge for knowledge's sake, is rather difficult. However, Bruner echoes this sentiment when he says that "Knowing is a process not a product," (Smith 2002). This is why Bruner believes that certain motives for learning trump others. Rather than focus on grades and competing with other students for ranks and GPAs, he writes that "interest in the material to be learned is the best stimulus to learning, rather than such externals goals and grades or later competitive advantage," (Smith 2002).

A model of the implementation of Bruner's concept of spiral curriculum is the Alaska Native Knowledge Network (ANKN). The ANKN is a partner "designed to serve as a resource for compiling and exchanging information related to Alaska Native knowledge systems and ways of knowing," (About ANKN). ANKN was established to "assist Native people, government agencies, educators and the general public in gaining access to the knowledge base that Alaska Natives have acquired through cumulative experiences over millennia," (About ANKN).

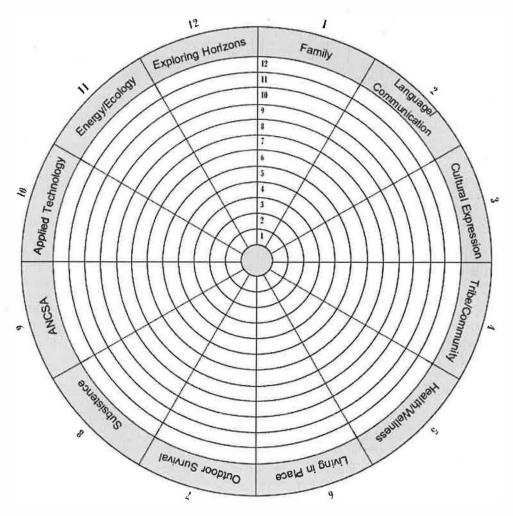


Figure 1: ANKN's model of Bruner's spiral curriculum.

ANKA uses 12 categories of emphasis when developing curriculum and lesson plans for implementation throughout Alaska; these categories are as follows: family, language/communication, cultural expression, tribe/community, heaith/wellness, living in place, outdoor survival, subsistence, Alaska Native Land Claim Settlement Act (ANLCSA) which targets cooperation/endurance, applied technology, energy/ecology, and exploring horizons. In the center of the spiral curriculum, designed as a web, the first number indicates 1st grade, and continues in an ascending manner until 12th grade. All 12 categories are then

addressed in each grade level until completion of the student's 12th year of education. This structure of learning echoes Bruner's statement that, "The teaching and learning of structure, rather than simply the mastery of facts and techniques, is at the center of the classic problem of transfer... If earlier learning is to render later learning easier, it must do so by providing a general picture in terms of which the relationship between things encountered earlier and later are made as clear as possible," (Bruner 1960, 12).

A new way of instruction and assessment has been created called the integrated thematic instruction model. Coupled with Bruner's ideas of curriculum development, integrated thematic instruction could produce a fantastical revolution in the educational system. The woman behind the ITI model, Susan Kovalik, developed the model to always stress "problem-solving and decision-making," (Kovalik 1994). In order to accomplish this, the ITI model implements:

...three interlocking, interdependent principles... First, that the human brain research has given us a window on learning never before realized in the history of civilization and that this knowledge must become the basis for all decisions made to improve student and teacher performance. Second, that teachers' strategies or ability to orchestrate learning in the classroom is both an art and a science... And third, curriculum development cannot be mandated by textbook publishers from afar but must be developed at the classroom level from the knowledge and understanding only the classroom teacher can bring to bear – an understanding of the learners and the communities in which they live. (Kovalik 1994)

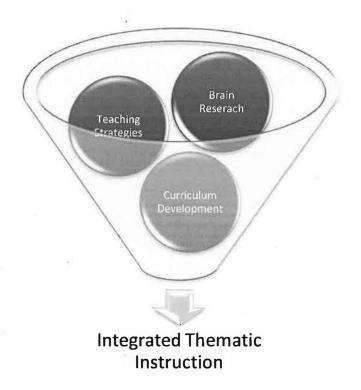


Figure 2: Integrated Thematic Instruction is a vehicle for bringing these three areas together, a way of conceptualizing a implementing a "brain compatible" learning environment for students and teachers (Kovalik 1994).

Integrade Thematic Instruction:

Interlocking, Interdependent Principles

Teachers' Strategies:

Brian Research:
Increased knowledge in how humans learn must be implemented when making "decisions made to improve student and teacher performance."

Likened as poetry in motion, a teacher greatly impacts their class with their strategies or ability to "orachestate learning in a classroom [as] both an

art and a science."

Curriculum
Development:
Textbook publishers
should not weild the
power curriculum;
"contunuum of concepts"
should be agreed upon for
all students in a given
district/region.

Figure 3: Elaboration on the principles that form the ITI model: brain research, teachers' strategies, and curriculum development.

The model is effective based on how the parts and pieces of the model are dovetailed together. At the heart and soul of this dovetailing is the concept of a yearlong theme in the classroom. The yearlong theme is "the source of curriculum development and sets direction for instructional strategies," (Kovalik 1994). The yearlong theme concept is simplistically brilliant and enables the classroom teacher to explore and teach skills while using a consistent trend of subject matter to convey these skills. Below is a figure that represents only three months of an academic year to illustrate the way in which a yearlong theme is graphically organized. Note that each weekly topic connects to a monthly component which ultimately ties into the yearlong theme. Therefore, nearly everything taught and learned throughout one academic year is relatable.



Figure 4: Yearlong theme

Although this organization seems simplistic, "the theme is so critical to brain-compatibility, its selection deserves careful thought," (Kovalik 1994). There are six main criteria to consider when developing a theme; the theme (Kovalik 1994):

- 1. must have substance and application to the real world,
- 2. must have readily available resources,
- 3. must be age-appropriate,
- 4. must be worthy of the time spent on it,
- 5. should flow from month-to-month and back to center,
- 6. lastly, the title should be a kid-grabber.

As the author of What's Worth Teaching? Selecting, Organizing, and Implementing Knowledge, Marion Brady states, "the primary purpose of schooling should be to help students understand their world;" therefore, the ITI model stresses curriculum that is applicable to the real world (Brady 1997). Similarly, the ITI model addresses these real world applications when assessing for mastery of a given inquiry.

Once the curriculum is established, a critical part of all teaching is assessing student learning. The ITI model also has a remedy for this often trite necessity. Kovalik discusses an alternative to the traditional bell curve which she argues is a "...dangerous tradition in all its applications: the classroom level, the institutional level, the workplace level," and further proclaims that the bell curve is "nonsense, counterproductive, expensive, and damaging," on both an academic

level and societal level (Kovalik 1994). This alternative focuses on mastery in terms of student competence and their ability to understand the skills and concepts taught and are able to apply them to real world situations. An alternative to the bell curve assessment, which Kovalik is an activist for, is a concept called the "3 Cs" of Assessment. These three criteria determine mastery of inquiries (Kovalik's word choice for assignments), they are: complete, correct, and comprehensive. Below is a diagram showing the relationship between these criteria and assessment of mastery.

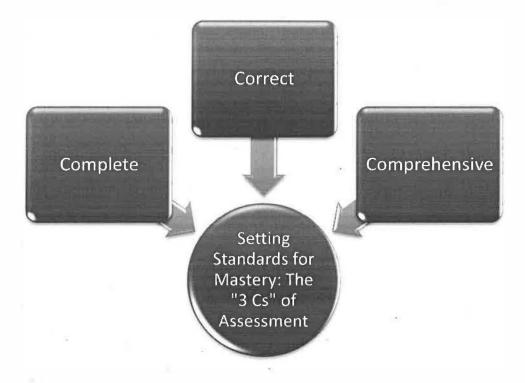


Figure 5: "3 Cs" of Assessment

1. Complete

Completion means that the inquiry met the specified requirements and within the timeline permitted.

2. Correct

The "work called for by the inquiry contained accurate information, the information used was the most recent available, and more than one source was consulted," (Kovalik 1994).

3. Comprehensive

This criterion requires the work to show a level of thoroughness of thought, exploration, and analysis. This thoroughness includes adequate researched information to support student opinion and additional view points.

Using yearlong themes joined with more applicable and rigorous assessment standards, Kovalik hopes to decrease the number of underprepared, under educated and illiterate students graduating high school. Due to low expectations and traditional grading techniques, Kovalik states that American high schools "graduate almost one million illiterate students a year," (1994). The "3 Cs" of Assessment will allow a teacher to accurately assess a student's learning in a multifaceted manner, not simply pass or fail. Furthermore, the yearlong theme coupled with "3 Cs" of Assessment acts as a call to action to Gardner's concerns in his book, *Unschooled Mind* (1991). Gardner acknowledges that the majority of students learn to become literate but in a way that is not necessarily conducive outside the classroom. While Gardner recognizes students are learning decoding skills, he maintains that students are still missing "two other facets: the capacity to read for understanding and the desire to read at all," (Gardner 1991: 186). Again, Gardner is concerned about students being inclined to use skills in daily life and do so in a productive manner.

Traditionally, students were passed from one grade to the other with educators not always being interested in their students' knowledge base, let alone how the curriculum will impact their students' lives on a real and practical manner. Rather than just teach students the traditional subject matters in the traditional ways, teachers are challenged to not merely teach their students, but to educate them. The incorporation and implementation of both yearlong curriculum themes and the "3 Cs" of Assessment will give teachers powerful tools to positively and in a transformative manner impact the lives of their students that will resonate well beyond the classroom walls.

Action Plan

No serious scientist or educator can cheapen the promising research and exciting evidence that alternative education with an ecopsychology foundation is truly one conceivable answer for reengaging at-risk youth. A *Curriculum Guide for the Inclusion of Ecopsychology in an Alternative Education Setting* will be created that can be implemented to address the importance of bridging the gap between the classroom and the creek. The following curriculum is grounded in nature as the subject matter to teach pertinent thinking and life skills.

Furthermore, the lessons are designed to be partially, if not fully, implemented in a natural outdoor setting. Lastly, the lessons intertwine the elements of Bruner's spiral curriculum and Kovalik's yearlong themes and assessment strategies.

Chapter III

Procedures

Genesis of the Project

Whilst substituting in the Tahoma School District right after student-teaching, the author stumbled upon a book entitled *Last Child in the Woods:*Saving Our Children from Nature-Deficit Disorder by Richard Louv. In fact, the author began reading the texts the night before she first taught at Maple Valley High School, the alternative high school in the Tahoma School District located in Maple Valley, Washington. If one would to take a look at the author's copy of the text now, one could see underlining, pink sticky notes, and highlighted text.

Although the author was instantly interested in the ideas of ecopsychology and alternative education while reading Louv's text, it was not until several years later, in graduate school, that the author had the opportunity and wherewithal to begin a curriculum guide for the inclusion of ecopsychology in alternative education.

Project Development

The author employed a systematic review of the related literature pertaining to ecopsychology and alternative education. This literature review was conducted using an assortment of online databases, and both electronically published texts and printed texts on the subjects. The databases used included: ERIC, PsycINFO, Article First, and JSTOR. The information derived from these

sources was organized into categories using a logical fashion in order to have the reader travel down the written path of the subjects blending together. These categories are illustrated in Chapter Two using the sub-headings: Society & Nature, At-Risk Youth, Emotional & Behavioral Problems, Nature Deficit, Alternative Education, Curriculum & Assessment, and Action Plan.

Several sources were instrumental in compiling the curriculum guide housed within this document. The most important influence came from substituting in alternative schools and speaking with teachers that work with atrisk youth on a daily bases. These teachers and the programs they run became a tangible place to watch a public alternative school function on a routine bases.

Project Implementation

The author hopes that this document will be implemented in alternative education settings throughout Washington State. With continuing research and development, the author foresees the adaption and evolution of this working document for the future.

Chapter IV

A Curriculum Guide for the Inclusion of Ecopsychology in an Alternative Education Setting



CURRICULUM GUIDE

for the Inclusion of Ecopsychology in an Alternative Education Setting

> Sara LeRoux Summer 2010

Please note: Images in this curriculum guide have been redacted due to copyright concerns.

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A Curriculum Guide for the Inclusion of Ecopsychology in an Alternative Education Setting

"...bridging the gap between the classroom and the creek."

Introductory & Exploration Seminar

Seminar Facilitator:

The following PowerPoint is intended to introduce the faculty to the exciting and promising field of ecopsychology and the powerful impact nature can play in the classroom.

In the PowerPoint, there are several important, and possibly to some staff members, new concepts and schools discussed. Main concepts and ideologies are: ecopsychology, alternative education and at-risk students, spiral curriculum, integrated thematic instruction. Furthermore, the PowerPoint looks at four practices as work (schools): Cedarsong Nature School, IslandWood, Foxfire, and Summit Preparatory School. Although there is essentially endless information pertaining to any of the above issues, this presentation is intended for a brief overview. Further research on any, or all, of the above are encouraged and recommended. Reviewing the material provided is crucial before presenting to faculty.

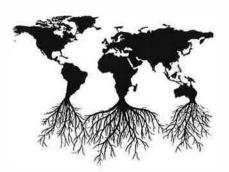
Although formats for this seminar can vary, ideally, this seminar would be held in a lecture hall or another room that will accommodate all faculty members (projector and screen will also be necessary). Discussions on the slides are encouraged throughout the presentation, and depending on width and breadth of these discussion, the time necessary to facilitate this PowerPoint will vary.

After the Introductory and Exploration Seminar, explain to the faculty that sample lesson plans will be provided in order to act as a model for including elements of ecopsychology in crafting and implementing lessons. Washington State Essential Academic Learning Requirements (EALRs) and Grade Level Expectations (GLEs) are included in each lesson to illustrate that lessons meet Washington State standards. Additionally, the sample lessons will address one or more standards from Alaska Standards for Culturally Responsive Schools. These lessons use Alaska Native Knowledge Network (ANKN) standards to address essential criteria such as, but not limited to: community contributor, quality producer, global citizen, etc. Combining both Washington State standards and those used from ANKN allows for a unique dynamic when constructing and executing lessons anchors in ecopsychology.

Sara LeRoux Curricula Developer

Helpful websites: Alaska Native Knowledge Network The Center for Effective Learning Children and Nature Network, C&NN

www.ankn.uaf.edu www.thecenter4learning.com www.childrenandnature.org



Introductory & Exploration Seminar

Facilitator

Summer 2010

Overview & Objectives

This seminar series is intended to serve as an introduction to the field of ecopsychology and the implementation of transformative lessons grounded in such a theory.

Objectives for Educators:

- Participate in staff development directed towards re-engaging atrisk students through the use of ecopsychology based curriculum.
- Learn the characteristics of ecopsychology, alternative education, and at-risk youth.
- Understand the positive impact nature has on humans' physical, mental, and emotional wellbeing.
- 4) Explore the field of ecopsychology and own experiences in nature.
- 5) Create lesson plans to incorporate student-nature interaction.
- Implement ecopsychology centered curriculum in own classroom.

Ec-o-psy-chol-o-gy

Definition

Noun

- The emerging synthesis of ecology and psychology
- 2) The skillful application of ecological insight to the practice of psychotherapy
- The study of our emotional bond with earth
- 4) The search for an environmentally-based standard of mental health

Philosophy

In the education arena, the philosophy of ecopsychology is to re-engage students with nature. This re-engagement will yield both emotional, behavioral and scholastic benefits.

& Alternative Education & AHRISK Youth

- Although a noted researcher, Dale Mann, declares that "there does not at this time appear to be a good definition or even description of who these youth are [youth at-risk]," there are several characteristics that correlate with a student's likelihood of dropping out of school.
- Living in high-growth states
- Living in unstable school districts
- √ Being a member of a low-income family
- Speaking English as a second language
- Being single-parent children
- Having a negative self-perceptions; being bored or alienated; having low self-esteem
- Having parents who are not high school graduates

"Along with milk and vegetables...

kids need a steady diet of rocks & worms; rocks need skipping, holes need digging, water needs splashing. bugs & frogs & slimy stuff need finding.

Importance of Ecopsychology Inclusion



Outdoor Behavioral Healthcare

 Study of participation in OBH indicate a "important reductions in the severity of behavioral and emotional symptoms."



Home Around Nature

Nature in or around the home was significant in protecting the "psychological well-being of children in rural areas."



Children with ADHA

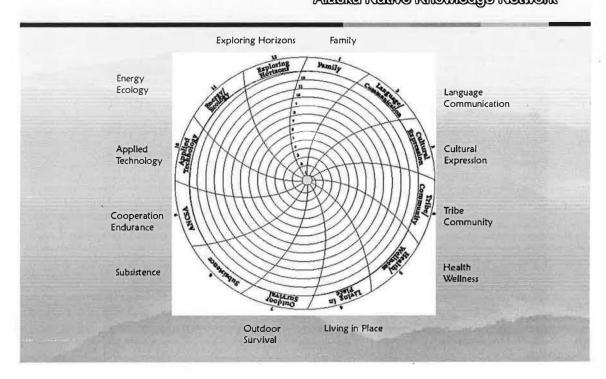
 Study conducted on children with ADHA. Results showed that students with ADHA had significantly better concentration after a walk in the park than in an urban setting.

Spiral Curriculum Jerome Bruner (1945-)

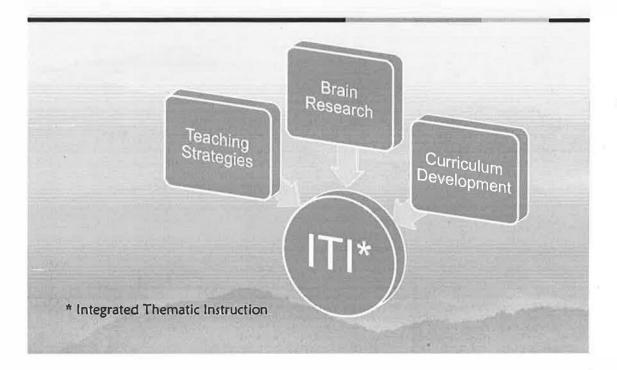
- Best-Know & Influential Psychologist of 20th Century
- Basic Principal of Spiral Curriculum:
 - A curriculum as it develops should revisit this basic ideas repeatedly, building upon them until the student has grasped the full formal apparatus that does with them.

'How one conceives of education,' he wrote, 'we have finally come to recognize, is the function of how one conceives of the culture and its aims, professed and otherwise.'

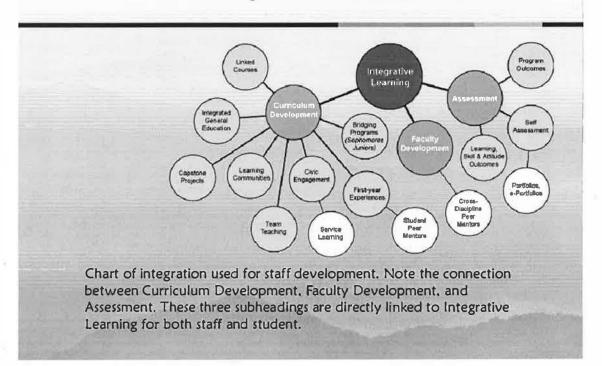
Spiral Curriculum Alaska Native Knowledge Network



Integrated Thematic Instruction



Integrated Thematic Instruction



Practices at Work

Gedensong Neiture School Vashon Island, Washington

Mission Statement: The mission of Cedarsong Nature School is to provide opportunities for direct experience with nature. Our goal is to increase awareness of and connection to the natural world in order to foster compassion and empathy for the earth and all its inhabitants.

Program Information: Cedarsong Nature School is an all-outdoor preschool for youngsters ages 3-5. Campus is located on 5 privately owned acres on Vashon Island from attorney-turned-teacher, Erin Kenny. Enrollment is limited to seven students at a time, and currently, Cedarsong has an extensive waiting list.

Images provided by The Seattle Times

Involvement of Nature: Students are literally outdoors the entire day and come dressed for the weather (only once in the last two years, due to heavy snowfall, has Kenny brought the toddlers inside). Like Forest Kindergartens in Europe, Kenny teaches her students about insects, birds, mammals, weather, edible plants, etc. from their treks in the forest.

Precioes at Work Island Wood, Aschool in the Woods Beinbridge Island, Washington

Mission Statement: To provide exceptional learning experiences and to inspire lifelong environmental and community stewardship.

Program Information: Through its flagship School Overnight Program, IslandWood's educators combine scientific inquiry, technology and the arts to help Puget Sound-area students discover natural connections with the outdoors. IslandWood also offers a wide range of programs and community events for adults, families and professionals.

Involvement of Nature: IslandWood sits on 255 acres on Bainbridge Island, Washington. The buildings themselves are made using sustainable recourses, recycled materials, Earth-Smart design, and Leadership in Energy and Environmental Design (LEED) certified. Some design elements include: solar panels, compost bins, cork flooring, and the site even treats its own sewage water in the Living Machine.

Images provided by www.Islandwood.org

Practices at Work Foxire Fund, Inc. Rabun County, Georgia

Mission Statement: Foxfire (The Foxfire Fund, Inc.) is a not-for-profit, educational and literary organization based in Rabun County, Georgia. Founded in 1966. Foxfire's learner-centered, community-based educational approach is advocated through both a regional demonstration site (The Foxfire Museum & Heritage Center) grounded in the Southern Appalachian culture that gave rise to Foxfire, and a national program of teacher training and support (the Foxfire Approach to Teaching and Learning) that promotes a sense of place and appreciation of local people, community, and culture as essential educational tools.

Program Information: Foxfire was born in 1966 as a magazine to teach students English skills while generating interest on the topic that would be the vessel for demonstrating these skills. From there, Foxfire caught on fire, and within 10 years of the first publication, there were studies conducted to see why Foxfire was such a successful program. Shortly thereafter, the Foxfire Approach to Teaching and Learning was used throughout the country. Now, Foxfire magazines are still be produced by school students and there is now a Foxfire Museum and Heritage Center that educates visitors on the historical impact Foxfire has had on the Appalachians and beyond.

Involvement of Nature: Foxfire was developed as a means of getting students interested in English curriculum. Using their own back yard and history, the students of Foxfire were able to create fantastical magazines about their native Appalachia. Students learned basic writing skills while creating the content in addition to gathering historical information about their area.

imag

www.foxflre.org

Practices at Work Summit Preparatory School Kalispell, Montana

Education Philosophy: Together, teachers and students at Summit Preparatory School become lifelong learners by pursuing the challenges of learning and enjoying the intrinsic reward of academic accomplishment and success.

Program Information: Summit Preparatory School "is an accredited private non-profit therapeutic boarding school specializing in compassionate, relationship-based treatment of bright, capable high school age youth who are struggling in their current academic and/or home community due to emotional, academic and behavioral concerns." Summit incorporates college preparatory academics and professional therapy.

Involvement of Nature: The school sits on 500 acres outside Kalispell, Montana. The campus location lends itself to easy access to nature and opportunities for hiking, rafting, skiing, fishing, camping, horseback riding, snowshoeing, and other outdoor activities. During semester breaks, students participate in week-long hiking and camping trips with counselors to work on teambuilding skills in a natural setting.

Image provided by www.summitprepschool.org

Assessing Student Learning

■ ITI: Authentic Assessment – focus on a nationwide movement in education which advocates using a variety of assessment tools by which students can demonstrate their ability to apply what they have learned to real world situations; such tools use standards on performance from the adult world.

CATCH-22:
Authentic assessment is possible only when student have been

given meaningful, authentic content which can then be assessed on the basis of usability!*

*Susan Kovalik

Setting Standards for Mastery: The "3 Cs" of Assessment

Work called for by the inquiry met all the requirements or Complete specifications of the inquiry, including timeliness. · Work called for by the inquiry contained accurate information Correct Information used was the most recent available; more than one source Work reflects thoroughness of thought and investigation; looked at from different points of Comprehensive view Conclusion was supported with relevant data

"Children learn best through their everyday experiences with the people they love and trust, and when the learning is fun. And the best place for these experiences is outdoors, in the natural world."

Center for Families, Communities, Schools and Children's Learning.

References Websites

Alaska Native Knowledge Network <u>www.ankn.uaf.edu</u>
Cedarsong Nature School <u>www.cedarsongnatureschool.org</u>
The Center for Effective Learning <u>www.thecenter4learning.com</u>
Foxfire Fund Inc. <u>www.foxfire.org</u>
IslandWood <u>www.islandwood.org</u>
Summit Preparatory School <u>www.summitprepschool.org</u>

A Curriculum Guide for the Inclusion of Ecopsychology in an Alternative Education Setting

"...bridging the gap between the classroom and the creek."

Sample Lessons

Greetings Fellow Teacher:

The following sample lessons are crafted in five different content fields to use as models when developing lessons for classroom implementation. Each lesson includes pertinent information such as: grade level, content field, time allotment, lesson implementation, assessment strategy, and attachments to execute the lessons.

These lessons can be used independently, but some work better as a unit (such as the science curriculum). Note that not only does the curriculum address issues in nature and uses the world as a springboard for learning, but also, the lessons are encouraged to be implemented outside the classroom walls in a natural setting. (Although teaching these lessons outside would be the best situation, sometimes it can be impractical and therefore the materials still lend themselves to environmental education.)

Washington State Essential Academic Learning Requirements (EALRs) and Grade Level Expectations (GLEs) are included in each lesson to illustrate that lessons meet Washington State standards. Additionally, the sample lessons will address one or more standards from Alaska Standards for Culturally Responsive Schools. These lessons use Alaska Native Knowledge Network (ANKN) standards to address essential criteria such as, but not limited to: community contributor, quality producer, global citizen, etc. Combining both Washington State standards and those used from ANKN allows for a unique dynamic when constructing and executing lessons anchors in ecopsychology.

Use these lessons and enjoy!

Sara LeRoux Curricula Developer

English

The Journey with Journals Language Arts

Adapted from Alaska Native Knowledge Network

Original Authors: Jenna Anasogak, Jolene Katchatag, Mike Kimber, John Sinnok, Nita Towarak, Cherly Pratt

Grade Level: 5-8 (can be adapted for lower or higher grade levels)

Subject (primary): Language Arts

Subject (secondary): Art

Part 1: One Hour Part 2: Year Long

Materials: Pocket knives, twine, tag board, cardboard and three-hole blank paper or manufactured notebooks with blank paper, "Tacky" glue, "modge podge", scissors, permanent markers, writing utensil

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

Writing EALR 1: The student understands and uses a writing process.

Component 1.1: Prewrites to generate ideas and plan writing.

- 1.1.1 Applies more than one strategy for generating ideas and planning writing.
- Generates ideas prior to organizing them and adjusts prewriting strategies accordingly (e.g., brainstorms a list, selects relevant ideas/details to include in piece of writing, uses a story board).
- Gathers information from a range of sources, formulates questions, and uses an organizer (e.g., electronic graphic organizer, chart) to analyze and/or synthesize to plan writing.

Component 1.6: Adjusts writing process as necessary.

- 1.6.1 Applies understanding of the recursive nature of writing process.
- Revises at any stage of process.

Edits as needed at any stage.

Writing EALR 2: The student writes in a variety of forms for different audiences and purposes.

Component 2.2: Writes for different purposes.

- 2.2.1 Demonstrates understanding of different purposes for writing.
- Writes to learn (e.g., math learning logs, reflections, double-entry logs, steps/strategies used to solve math problems), to tell a story, to explain, and to persuade.
- Includes more than one mode within a piece to address purpose (e.g., descriptive details or narrative anecdote within an explanation).

Writing EALR 3: The student writes clearly and effectively.

Component 3.1: Develops ideas and organizes writing.

- 3.1.1 Analyzes ideas, selects a narrow topic, and elaborates using specific details and/or examples.
- Narrows topic with controlling idea (e.g., from general topic, such as baseball, to specific topic, such as "The Mariners are my favorite baseball team.").
- Selects details relevant to the topic to extend ideas and develop elaboration (e.g., specific words and phrases, reasons, anecdotes, facts, descriptions, examples).
- Uses personal experiences, observations, and research to support opinions and ideas (e.g., data relevant to the topic to support conclusions in math, science, or social studies; appropriate anecdotes to explain or persuade).

Component 3.2: Uses appropriate style.

- 3.2.1 Applies understanding that different audiences and purposes affect writer's voice.
- Writes with a clearly defined voice appropriate to audience (e.g., informal versus formal voice).
- Writes in appropriate and consistent voice in narrative, informational, and persuasive writing (e.g., a "how to" paper vs. a persuasive piece).
- 3.2.2 Uses language appropriate for a specific audience and purpose.
- Uses precise language (e.g., powerful verbs, specific descriptors).
- Uses formal, informal, and specialized language (e.g., *photosynthesis*, *ratio*, *expedition*) appropriate for audience and purpose.
- Uses literary and sound devices (e.g., similes, personification, rhythm).
- Selects words for effect.

Alaska Standards for Culturally Responsive Schools

- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 1. Recognize and build upon the inter-relationships that exist among the spiritual, natural, and human realms in the world around them
 - 2. Understand the ecology and geography of the bioregion they inhabit

Procedures

OVERVIEW:

This activity will provide your students with a means to record information and personal observations throughout the entire unit on edible plants. The students will need their journals for most of the lessons within the Maple Theme. "Journal keeping should be a joyful experience... A celebration rich in personal reward and positive feedback". William Hammond, Natural Context, 1993

BACKGROUND & DISCUSSION:

"A journal is a place for thinking and feeling, for harvesting the moment, the image, the idea, the place you occupy. Don't wait to paint the perfect picture or sketch; don't wait for the time when you have time to write the polished essay or poem but rather get down on the pages of your journal those core images, ideas and fragments of experience you are now feeling. Edit or recompose later if you must. Grab images, words, drawings, pressed leaves, dirt, post cards, anything that impresses you and will help you remember the time, place and events you are experiencing and creatively get them into you journal. William Hammond, Natural Context, 1993

from Project Wild, Western Regional EE Council, 1983

A naturalist is a person who studies nature, especially by direct observation of plants, animals, and their environments. Naturalists often spend alot of time in the out-of-doors, and the often record their obsessions in some form - from sketches, drawings, paintings, and photos, to poetry and prose. Each person's motivation will be unique, and may include sheer joy in learning more about natural systems, interest in contributing to scientific research, love for the art of writing as literature, and simple satisfaction in being outside.

People benefit today from the insights and observations of people who have delighted in, and been fascinated by, the wonders of the natural environment. Henry David Thoreau, Walt Whitman, Enos Mills, John Muir, and today's Edward Abbey and Annie Dillard are among those who have captured their insights in words and offered them to others.

Most of the naturalists who put their observations in poetry and prose carry with them a small journal as they wander the woods, streams, lakes, oceans, deserts, and other

natural environments.

The major purpose of this activity is for students to make their own journals, and to acquires experience in using a journal to record their observations and findings in out-of-door settings.

GETTING READY:

Bring in an example of a journal, handmade or published, which includes illustrations from the author. There are many examples available for purchase by explorers, gardeners, travelers, etc. Maybe someone in your community would be able and willing to share a personal journal with the class.

LESSON IMPLEMENTATION:

- A. 1. Have students cut two pieces of tag board for a front and back cover of their journals. These pieces should be slightly bigger than the size of the three-hole paper they are going to be using.
- 2. Make holes into the tag board to match to the holes in the paper. (Optional -Cut out two thin pieces of cardboard the same size as the tag board and use Tacky glue to adhere these to the front and back covers. Punch holes in the cardboard to match that of the tag board.)
- 3. Fasten the paper and covers together using natural twine weaving it through the holes.

Some students may wish to fasten a small maple branch into the twine lengthwise with the journal as decoration. The front covers can be decorated any way the students desire. It would be nice to use parts of the maple for these decorations. Small twigs can be glued down to form an elaborate design and then coated with modge podge to seal.

The possibilities are endless for making a journal personal and creative. Allow students ample time to create something that will be special.

"Every journal is uniquely shaped by its keeper. Every journal is designed by its keeper and is a powerful creativity tool which in turn helps to continue to redesign the designer! This is exactly why there can be no "best" way to do journal. You as the designer must design not only the journal techniques and approaches you wish to use but you must understand YOUR purpose for journal keepings and design a journal keeping system which will nurture that purpose. Journals should be places for invention!" William

Hammond, Natural Context, 1993.

Once the journals are created: (Part Two)

- B. 1. Take the students to a place near the school where maples are growing and have each of them choose a "Special Spot" in the maples. These Special Spots can be visited over and over again during the unit.
- 2. Have students spend time here today writing, drawing and recording their thoughts and observations in a creative way. Use questions below to prompt writing.
- a. Why is this spot 'special?'
- b. Draw a picture of a maple
- c. Using that drawing as inspiration, write three (3) sentences describing the maple.
- 3. Ask them to include a complete description of all the information they already know about maples and what they want to know about maples. (Later in the unit, you can ask students to discuss if their questions were answered and what they have learned about maples.)
- 4. Before you leave, have students press some of the leaves (esp. in the spring) or seeds from maples (esp. in the fall) into their journals.

ASSESSMENT:

You may have students write a self-assessment of the creativity of their journal and a description of what they are already planning to include in their journals. Use their writing as an assessment also. What information did they discover about maples? What do they already know about maples and what do they want to know?

Complete

- Students write self reflection in their journal
- Students have 20 minutes to write (timeline for assessment)

Correct

- Students are able to write for the timeline of the assessment
- Students discuss in their journal what they are planning to include

Comprehensive

Answers show thought and reflectiveness

Stories and Beliefs of Local Birds Language Arts

Adapted from Alaska Native Knowledge Network

Original Authors: Jenna Anasogak, Jolene Katchatag, Mike Kimber, John Sinnok, Nita Towarak, Cheryl Pratt

Grade Level: 2-3

Subject (primary): Language Arts

Part 1: One hour minimum, can vary length

Materials: books on native birds, a ornithologist or local expert on birds

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

Reading EALR 1: The student understands and uses different skills and strategies to read.

Component 1.1: Use word recognition skills and strategies to read and comprehend text.

- 1.1.4 Apply understanding of phonics.
- Read words containing complex <u>letter patterns</u> and/or <u>word families</u> (e.g., -ieve, -eive, -ield) in isolation and in context.
- Apply multi-syllabic decoding when reading words in all text.

Reading EALR 2: The student understands the meaning of what is read.

Component 2.2: Understand and apply knowledge of text components to comprehend text.

- 2.2.3 Understand story elements.
- Describe characters' physical traits and infer personality traits by what they say and do.
- Describe the problem faced by a character and how he/she/it solves the problem.
- Explain how the setting is important to the story.
- Identify the speaker (narrator) in a selection and explain first person point of view.
- Select, from multiple choices, the best description of a character or setting in a story or poem (e.g., character traits, feelings, character's problem, or importance of character).

Reading EALR 3: The student reads different materials for a variety of purposes.

Component 3.4: Read for literary experience in a variety of genres.

- 3.4.1 Understand different perspectives of family, friendship, culture, and traditions found in literature.
- Listen to, read, and discuss a variety of literature representing different perspectives of family, friendship, culture, and tradition, generating a personal and/or text-based response.
- 3.4.2 Understand contemporary and traditional literature written in a variety of genres.
- Explain the characteristics of a variety of genres.
- Respond to literature from multiple genres using teacher prompts appropriate to the text and content.
- 3.4.3 Understand a variety of literature representing different cultures and traditions.
- Discuss the culture and/or traditions described in a piece of literature and explain how they are similar or different from those of the reader.

Alaska Standards for Culturally Responsive Schools

- A- Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community.
 - 3. Acquires and pass on the traditions of their community through oral and written history.
- B- Culturally-knowledgeable students are able to build on the knowledge and skills of the local cultural community and foundation from which to achieve personal and academic success throughout life.
 - 4. 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.

Procedures

NOTE TO TEACHER:

Targeted grade level is 2/3 but lessons and materials could be adapted for other elementary levels. This lesson can be expanded and the idea and study of local birds can become a culminating unit throughout the year and in between subject areas. In order for students to spend as much time outside as possible, this lesson would be best implemented in fall/spring when the weather is a little more predictable.

BACKGROUND & DISCUSSION:

Oral traditions find their roots in many native cultures. Historically, oral traditions were used to communicate history from culture-to-culture. Even today, oral stories are passed down from one family member to another. Using birds as the subject for knowledge transfer, oral stories of local birds and their importance will be used to implement this lesson.

LESSON IMPLEMENTATION:

- 1) Read a traditional story about a bird which is found locally. (Raven is a good one as there are raven stories in many cultures. Look at sample lesson 3 for raven stories.) Discuss what is a "traditional" story as compared to a life experience story or fiction and how sometimes traditional stories were used to explain certain bird characteristics (eg. why raven is black). Point out that there may be different versions of the same story. Ask students if they have heard any local stories about birds. Read a story about a different bird.
- 2) Assign students to interview family members about stories and beliefs involving birds. Invite an elder/expert to come to class to relate a bird story and tell about local beliefs and taboos involving birds. Discuss these beliefs and others which students may have heard. For example, there is a bird which tells that the fish are coming; some people believe that the owl foretells death and that the raven's behavior can indicate luck.

Discuss why there were so many beliefs about the birds?

List the reasons birds were highly respected.

- 3) After researching for a story, have students retell a traditional story either orally or in written form. (This activity would be perfect for a sunny day in fall/spring in order to take the class outside.)
- 4) Make and illustrate a class book of local bird beliefs.

Assessment:

The assessment of student learning can take place when they recite their stories to the class. Following these stories, the class and the teacher can ask pertinent questions pertaining to the information that student gathered on a particular bird.

Complete

- What information did they discover about maples?
- What do you alrady know about maples and what do you want to know?
- Answer questions using 5+ sentences
- Students recite story in class (timeline for assessment) when called upon

Correct

- Students answer first question with information that was presented to the class about maples
- Students are able to list several sources of information, ie books, expert, etc.

Comprehensive

- Answers show reflectiveness and understanding of the topic, birds
- Students broaden their knowledge on birds and share stories or prior knowledge.

The Raven: Legend and Lore and More? Language Arts

Adapted from Public Broadcasting System, PBS Teachers

Grade Level: 4-6

Subject (primary): Language Arts

Activity 1: 30-45 minutes Activity 2: 40-50 minutes Activity 3: 60 minutes or more

Washington State Essential Academic Learning Requirements & Grade Level Expectations

Reading EALR 1: The student understands and uses different skills and strategies to read.

Component 1.3: Build vocabulary through wide reading.

- 1.3.1 Understand and apply new vocabulary.
- Integrate new vocabulary from <u>informational/expository text</u> and <u>literary/narrative text</u>, including text from a variety of cultures and communities, into written and oral communication.

Component 1.4: Apply word recognition skills and strategies to read fluently.

- 1.4.2 Apply <u>fluency</u> to enhance comprehension.
- Read aloud grade-level <u>informational/expository text</u> and <u>literary/narrative text</u> accurately, using appropriate pacing, phrasing, and expression.

Reading EALR 2: The student understands the meaning of what is read.

Component 2.1: Demonstrate evidence of reading comprehension.

2.1.6 Apply comprehension monitoring strategies to understand fiction, nonfiction, informational text, and

task-oriented text: monitor for meaning, create mental images, and generate and answer questions.

- Monitor for meaning by identifying where and why comprehension was lost and use <u>comprehension</u><u>repair strategies</u> to regain meaning.
- Generate and answer questions about the text before, during, and after reading to aid comprehension.
- Use <u>questioning strategies</u> to comprehend text.
- Draw, write about, or verbally describe the mental images that occur while reading.

Component 2.3: Expand comprehension by analyzing, interpreting, and synthesizing information and ideas in literary and informational text.

- 2.3.2 Analyze sources for information appropriate to a specific topic or for a specific purpose.
- Select appropriate resources such as an atlas, newspaper, magazine, memos, directories, and/or schedules, to locate information on a specific topic or for a specific purpose.
- Sort information gathered from various sources by topic and judge the utility of the information for a specific purpose.

Writing EALR 1: The student understands and uses a writing process.

Component 1.1: Prewrites to generate ideas and plan writing.

- 1.1.1 Applies more than one strategy for generating ideas and planning writing.
- Generates ideas prior to organizing them and adjusts prewriting strategies accordingly (e.g., brainstorms a list, selects relevant ideas/details to include in piece of writing, uses a story board).
- Gathers information from a range of sources, formulates questions, and uses an organizer (e.g., electronic graphic organizer, chart) to analyze and/or synthesize to plan writing.

Component 1.2: Produces draft(s)

- 1.2.1 Produces multiple drafts.
- Refers to a prewriting plan.
- Drafts by hand and/or electronically.
- Rereads text and continues drafting over time.
- Rereads text, puts it away, and returns to it later.

Component 1.3: Revises to improve text.

- 1.3.1 Revises text, including changing words, sentences, paragraphs, and ideas.
- Rereads work several times and has a different focus for each reading (e.g., first reading adding details for elaboration; second reading deleting sentences or phrases to achieve paragraph unity; third reading reorganizing ideas for meaning).
- Records feedback using writing group procedure (e.g., partner underlines telling sentences, such as "I had fun," and writer changes to show detail, "I squealed as the roller coaster sped around a corner.").
- Makes decisions about writing based on feedback (e.g., revision before final draft).
- Uses multiple resources to identify needed changes (e.g., writing guide, peer, adult, computer, thesaurus).

Component 1.4: Edits text.

- 1.4.1 Applies understanding of editing appropriate for grade level (see 3.3).
- Identifies and corrects errors in grade level conventions.
- Uses multiple resources regularly (e.g., dictionary, peer, adult, available technology, writing guide).
- Proofreads final draft for errors.

Component 1.5: Publishes text to share with audience.

- 1.5.1 Publishes in more than one format for specific audiences and purposes.
- Publishes using a variety of publishing options (e.g., book, poster).
- Publishes multipage pieces and attends to format, graphics, illustrations, and other text features (e.g., captioned photos, maps).
- Publishes for a wide range of purposes, in different forms and formats.
- Uses a variety of available technology as part of publication (e.g., slide show, overhead projector, publication software).

Component 1.6: Adjusts writing process as necessary.

- 1.6.1 Applies understanding of the recursive nature of writing process.
- Revises at any stage of process.
- Edits as needed at any stage.
- 1.6.2 Uses collaborative skills to adapt writing process.
- Contributes to different parts of writing process when working on a class poetry book (e.g., individuals
 draft poem; group plans format together; individuals submit word processed poems; team edits; class
 publishes).
- 1.6.3 Uses knowledge of time constraints to adjust writing process.
- Works on one draft over several days or weeks adjusting work to fit the time frame.
- Allots amount of time for each stage of writing process for on-demand writing.
- Adjusts the number of drafts for on demand tasks.

Writing EALR 2: The student writes in a variety of forms for different audiences and purposes.

Component 2.1: Adapts writing for a variety of audiences.

- 2.1.1 Applies understanding of multiple and varied audiences to write effectively.
- Identifies an intended audience.
- Identifies and includes information a diverse audience needs to know (e.g., explains prior events, makes no assumptions about audience's prior knowledge, such as defining an ollie in skateboarding).
- Anticipates readers' questions and writes accordingly.

Component 2.2: Writes for different purposes.

- 2.2.1 Demonstrates understanding of different purposes for writing.
- Writes to analyze informational text or data (e.g., explains the steps of a scientific investigation).
- Writes to learn (e.g., math learning logs, reflections, double-entry logs, steps/strategies used to solve math problems), to tell a story, to explain, and to persuade.
- ... Writes for more than one purpose using the same form (e.g., a letter used to explain, to request, or to persuade).
- Includes more than one mode within a piece to address purpose (e.g., descriptive details or narrative anecdote within an explanation).

Component 2.3: Writes in a variety of forms/genres.

- 2.3.1 Uses a variety of forms/genres.
- Includes more than one form/genre in a single piece (e.g., a report about salmon that includes a poem,

fact box, and story).

- Maintains a log or portfolio to track variety of forms/genres used.
- Produces a variety of new forms/genres.

Writing EALR 3: The student writes clearly and effectively.

Component 3.1: Develops ideas and organizes writing.

- 3.1.1 Analyzes ideas, selects a narrow topic, and elaborates using specific details and/or examples.
- Narrows topic with controlling idea (e.g., from general topic, such as baseball, to specific topic, such as "The Mariners are my favorite baseball team.").
- Selects details relevant to the topic to extend ideas and develop elaboration (e.g., specific words and phrases, reasons, anecdotes, facts, descriptions, examples).
- Uses personal experiences, observations, and research to support opinions and ideas (e.g., data relevant to the topic to support conclusions in math, science, or social studies; appropriate anecdotes to explain or persuade).
- Varies method of developing character (e.g., dialogue) and setting (e.g., through the eyes of a character) in narratives.

Note: Well written, language-rich text as models should include a multicultural perspective and be read aloud to students throughout all grade levels.

- 3.1.2 Uses an effective organizational structure.
- Writes in a logically organized progression of unified paragraphs.
- Develops an interesting introduction in expository writing (e.g., leads with the five W's, an interesting fact).
- Develops an effective ending that goes beyond a repetition of the introduction (e.g., summary, prediction).
- Varies leads and endings in narratives.
- Sequences ideas and uses transitional words and phrases to link events, reasons, facts, and opinions within and between paragraphs (e.g., order of importance least, most).
- Organizes clearly:
 - comparisons (e.g., point-by-point)
 - explanations (e.g., save most important point for last)
 - persuasion (e.g., if-then)
 - narratives (e.g., problem-solution-outcome)

Component 3.2: Uses appropriate style.

- 3.2.1 Applies understanding that different audiences and purposes affect writer's voice.
- Writes with a clearly defined voice appropriate to audience (e.g., informal versus formal voice).
- Writes in appropriate and consistent voice in narrative, informational, and persuasive writing (e.g., a "how to" paper vs. a persuasive piece).

Component 3.3: Knows and applies writing conventions appropriate for grade level.

- 3.3.1 Uses legible handwriting.
- Maintains consistency in printing or cursive handwriting (e.g., size, spacing, formation, uppercase and lowercase).
- 3.3.3 Applies capitalization rules.

- 3.3.4 Applies punctuation rules.
- 3.3.5 Applies usage rules.
- 3.3.6 Uses complete sentences in writing.
- 3.3.7 Applies paragraph conventions.
- 3.3.8 Applies conventional forms for citations.

Alaska Standards for Culturally Responsive Schools

- A- Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community.
 - 5. Acquires and pass on the traditions of their community through oral and written history.
- B- Culturally-knowledgeable students are able to build on the knowledge and skills of the local cultural community and foundation from which to achieve personal and academic success throughout life.
 - 6. 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.
- D- Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.
 - 1. Gather oral and written history information from the local community and provide an appropriate interpretation of its cultural meaning and significance.

Procedures

OVERVIEW:

- 1. Analyze the variety of ways the raven has been perceived by different cultures.
- 2. Conduct research on the raven and classify the information.
- 3. Design art and language activities using their knowledge of ravens.

BACKGROUND & DISCUSSION:

From images of death or ill omen to images of placing the sun in the sky, the raven has captured the attention of civilizations throughout the centuries. In this lesson students will conduct research to learn about the fascinating ways and lore of the raven.

LESSON IMPLEMENTATION:

Activity 1:

The purpose of this activity is for students to activate their background knowledge of ravens. (Plan this lesson for the early fall or late spring so the students can complete Activity 1 outside.) Have the class sit in a circle or two semi-circles to complete the following:

- 1. Involve students in a class discussion about ravens. Elicit personal perceptions and encounters with ravens.
- 2. Read and discuss how the raven is portrayed in the following quotation from BEOWULF:
- "... but the black raven, eager for the doomed ones, as he shall say much to the eagle of what success he had at feeding, when he, with the wolf, plundered the corpses."
 - 3. Generate a list of words that could be used to describe the raven in the BEOWULF quotation.

- 4. Read and discuss how the raven is portrayed in "The Man and the Ravens" myth from this site (access the site, then select "Stories" from the menu on the left, then "Raven Stories" from the menu that appears): http://www.indigenouspeople.net/ipl_final.html
- 5. Generate a list of words that could be used to describe the raven in "The Man and the Ravens" myth.
- 6. Compare and contrast how the raven is portrayed in the BEOWULF quotation and the myth.
- 7. Find examples from the RAVENS program that illustrate the dichotomy in which ravens are perceived.

Activity 2:

The purpose of this activity is for students to build on their basic knowledge of ravens by collecting facts, artwork, photos, and anecdotes about ravens.

- 1. Break students into small groups and send them on a scavenger hunt to find information on ravens (typically school library and/or computer lab).
- 2. Information should be collected for these categories:
- Create a raven attribute chart including the following:
- Where ravens live
- What ravens eat
- Physical characteristics
- Particular characteristics useful for a raven's survival
- Works of art containing ravens
- Photos of ravens
- Raven anecdotes
 - 3. Encourage students to use a variety of resources. These sources might include the RAVENS program, books, magazines, personal stories, and Internet sources. The

following sites are a good place to begin Internet research:

- Pennsylvania Game Commission Web site:
 http://www.pgc.state.pa.us/pgc/cwp/view.asp?a=458&q;=150475
- ADF&G Wildlife Notebook Web site:
 http://www.adfg.state.ak.us/adfg/notebook/bird/raven.php
- 4. Provide time for students to select information from each category and share it with the class.

Activity 3:

The purpose of this activity is for students to use the knowledge acquired in Activity One to convince a person to change his negative opinion of ravens. (Again, plan this lesson for the early fall or late spring so the students can complete Activity 1 outside.) Have the class sit in a circle or two semi-circles to complete the following:

- 1. Read the following quotes and discuss how ravens were portrayed by William Shakespeare:
- In Shakespeare's play "Macbeth," the raven "croaks the evil entrance."
- In the play "Othello," Shakespeare writes that the raven flies "o'er the infected house."
 - 2. Tell the students that William Shakespeare is going to visit their class, and they will be presented with an opportunity to convince William Shakespeare to change the way he portrays the raven in his writings.
 - 3. Working in the same small groups from Activity One, ask students to complete the following activities:

A. Choose one of these activities:

- Write a poem about the raven and copy it onto a piece of poster board
- Create a work of art featuring the raven (example: poster, mural, sculpture, etc.).
 Encourage students to use items they find outside on a nature walk to complete their create art work with.

- B. Choose one of these activities:
- Write a short story about a raven's antics from the raven's point of view
- Write a skit about a raven
- C. All groups must complete this activity
- Write an impassioned plea to Shakespeare that explains why he has been wrong in his portrayal of the raven.

ASSESSMENT:

After each group completes a written plea to Shakespeare, have the groups present and a winner determined. Using the winner plea as an example, have the class dissect the paper to example why the piece won. What word choice and facts were presented in a persuasive manner?

Complete

- Each group has a written plea to Shakespeare complete within the class period (timeline for assessment).
- Facts on raven included and why these facts are important to their plea

Correct

- Each group member participates in the formulation of the written plea, opinions are shared and encouraged
- Facts presented on the raven are correct and derive from reserach conducted

Comprehensive

- Different points of view are presented, but ultimately, the plea comes from one.
- Plea is supported with reserach on the raven and shows thoroughness of research conducted on the topic

RESOURCES:

- Native American Lore
 http://www.ilhawaii.net/~stony/loreindx.html
- The Raven Archive bibliography
 http://www.rinzai.com/raven/bibliography.html
- o "The Raven" E. A. Poe Society of Baltimore http://eapoe.org/works/poems/ravenb.htm

Social Studies

Call of the Wild is Fading: Shrinking Wolf Habitat Social Studies

Adapted from Environmental Education for Kids (Eek!) and Wisconsin Schools

Grade Level: 5-8 (can be adapted for lower or higher grade levels)

Subject (primary): Social Studies Subject (secondary): Science

Part 1: One Hour, but can adapt for longer

Materials:

- o Introduction handout (attached)
- o green and blue construction paper
- o classroom desks, tables or chairs
- o five or six large bed sheets or blankets for a student group of 25

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

EALR 3: GEOGRAPHY The student uses a spatial perspective to make reasoned decisions by applying the concepts of location, region, and movement and demonstrating knowledge of how geographic features and human cultures impact environments.

Component 3.1: Understands the physical characteristics, cultural characteristics, and location of places, regions, and spatial patterns on the Earth's surface.

- 3.1.1 Analyzes maps and charts from a specific time period to analyze an issue or event.
- 3.1.2 Understands how human spatial patterns have emerged from natural processes and human activities in the past or present.

Component 3.2: Understands human interaction with the environment.

3.2.1 Understands and analyzes how the environment has affected people and how people have affected the environment in Washington State in the past or present.

EALR 4: HISTORY The student understands and applies knowledge of historical thinking, chronology, eras, turning points, major ideas, individuals, and themes of local, Washington State, tribal, United States, and world history in order to evaluate how history shapes the present and future.

Component 4.1: Understands historical chronology.

4.1.1 Analyzes a major historical event and how it is represented on timelines from different cultural perspectives.

Component 4.2: Understands and analyzes causal factors that have shaped major events in history.

- 4.2.2 Understands and analyzes how cultures and cultural groups contributed to Washington State or world history.
- 4.2.3 Understands and analyzes how technology and ideas have impacted Washington State or world history.

Component 4.4: Uses history to understand and present and plan for the future.

4.4.1 Analyzes how an event in Washington State or world history helps us to understand a current issue.

Alaska Standards for Culturally Responsive Schools

- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 7. Recognize and build upon the inter-relationships that exist among the spiritual, natural, and human realms in the world around them
 - 8. Understand the ecology and geography of the bioregion they inhabit

Procedures

OBJECTIVES:

Students will learn about some of the effects of land development on wolves and their habitat.

Students will recognize that loss of habitat is the most critical problem facing wolves today.

BACKGROUND & DISCUSSION:

All around us, and all over the planet, wildlife habitat is being lost. Whenever an area of land is paved for a shopping center, divided and excavated for homes for people, and sometimes when it is plowed to grow a crop, animals lose their homes, frequently their sources of food and water, and, in some cases, the large expanse of habitat they need to survive. A wolf pack's territory may cover 20-120 square miles. This need for a large range often results in conflict as human and wolf territories overlap. Today, timber wolf populations are improving in Wisconsin with the help of research, protection, and public education programs. But there is concern over how the growing human territories will impact wolf populations.

The major purpose of this activity is for students to simulate some of the potential impacts of land development on wildlife and its habitat, and to understand that loss of habitat is generally considered to be the most critical problem facing wildlife today.

Address the issue of wolf reintroduction into Washington State (this can be an entire lesson plan in and of itself). Acknowledging that Washington State once had many wolves and are now being reintroduce to parks, national forests, etc.

LESSON IMPLEMENTATION:

Read the introduction to the subject (see attached). Hold a brief class discussion based on the information provided. Briefly discuss laws that impact wolves and their habitat. These laws can be from Washington State and/or other local and national laws impacting wolves and their habitat. Again, due to the large volume of information, this lesson can be easily expanded to address other grade levels and content areas. This topic would be great of integrating with other content fields.

- 1. Discuss the elements necessary for a habitat (food, water, shelter and enough space) with your students. Then explain that they will be simulating wolves in their native habitat.
- 2. Divide the students into four groups: deer and beaver (herbivores), wolves (carnivores), vegetation (trees, shrubs, grasses) that deer and beaver may eat and people who will be land developers. If the students are not familiar with these terms, provide them with definitions. Plan for three times as many deer and beaver as wolves with a small number of developers in proportion to the other two groups. The number of students acting as vegetation may vary. For example, two developers, three wolves, nine deer and beaver, and six trees or bushes.
- 3. Establish a large open area outside in a place that can be used to simulate a large tract of forest before development (outside would be best). Developers should stay on the sidelines and keep an eye on the undeveloped land while they meet nearby to discuss the possibilities of developing this land into a community with a major highway.
- 4. Provide each deer/beaver with hula hoops to use as a shelter, three pieces of green construction paper to represent food, one piece of blue construction paper to represent water, and some vegetation (as portrayed by other students). Provide each wolf with one hula hoop to use as a "lair" space equivalent to that used by three herbivores, three herbivores as a potential food source, one piece of blue construction paper to represent water, and some vegetation portrayed by students.
- 5. Ask the herbivores to arrange their food, water and shelter, including the students who are "vegetation," in order to represent their habitat. Then, ask the wolves to move into the area to establish their habitat and look for possible food sources (herbivores). Have each animal role play its characteristics. This phase takes about 10 minutes, with the developers planning while the deer/beaver and wolves arrange their habitat.
- 6. Once all the animals are established in their habitats, it is time for the developers to enter the picture. These developers have been given the opportunity to create a housing area with shopping and a highway system leading out of the community. (They may use 3 to 7 minutes to construct their development, explaining their actions as they take them.) Restrict them to an area equivalent to the space of three herbivores. Have developers use sheets and blankets to build their development. They may remove trees (represented by the students) gently so no student gets hurt, shelter (represented by desks), food, and water.
- 7. Once they have finished building their development, discuss what happened. What took place? With what consequences? Would or did animals die? From what causes? Could developers have done anything differently to change the consequences? Could they have developed in a different pattern, with what effects? Would it have reduced negative consequences for wolves and other wildlife if they put the development in a

different area of the habitat? Were there any positive consequences? How were they achieved? Ask the students to discuss what was realistic about the activity and what was not.

8. Ask the students to summarize some of the possible impacts on wolves and other wildlife from land development. Are there places in your community where wildlife habitat has been lost by human development? Are there places where wildlife habitat has been enhanced by human activity? What choices, if any, are there to development of previously undeveloped areas? What trade-offs are involved: for example, in developing vacant areas within communities rather than undeveloped areas outside of communities? What kinds of actions, can people take to minimize the negative consequences for wildlife, vegetation, and other elements of the environment?

ASSESSMENT:

Have the students create an informative brochure either handmade or using a program such as Microsoft Publisher. Included in this brochure must be information regarding wolves as a whole and their habitat loss. How do humans impact wolves and vica-versa. Lastly, one panel of the brochure needs to be dedicated to how humans can protect wolves from habitat loss. Resources used must be included in the brochure. Once completed, these brochures will be displayed somewhere on campus.

Complete

- Timeline for assessment is beginning of next class period. Students will have time in class to work on brochures, but need to be compelte and ready to turn in next class period.
- Brochure needs to include all the information listed above

Correct

- Information used for the brochure is correct and form multiple sources, online and otherwise
- More than one source used

Comprehensive

- Answers show reflectiveness and understanding of the topic, wolves
- Different points of view on peoples' thoughts and feelings about wolves are considered

Call of the Wild is Fading: Shrinking Wolf Habitat

Timber Wolf

Wisconsin Status: Protected Federal Status: Endangered

Have you ever heard a wolf howl in the wild? Not many people have. Once, the haunting sound of wolves echoed throughout North America. Three hundred years ago, somewhere betweeen 3,000-5,000 wolves roamed all over Wisconsin. In 1957 there were no wolves here. In 2009, it is estimated that there are between 630-680 wolves across the state, most of them in the northern half of Wisconsin.

Timber wolves before you were born

Long ago, the land in Wisconsin provided wolves with the kind of habitat (food, water, shelter, space) they needed. But beginning in the 1830's, many settlers moved to our state and started to change the landscape. They cleared land to put in roads and to build towns and farms. They hunted elk and bison, animals that were part of wolves' diets, until the elk and bison were gone.

Animals responded in different ways to these habitat changes. Some animals such as rabbits, quail and deer were able to adapt to the new habitats created around farms. Their numbers grew.

Other animals, such as wolves, couldn't adapt to the changes. Their numbers declined.

Wolves were also affected by the ideas people had about them. Some settlers were afraid of wolves. They believed the folk and fairy tales that described wolves as big, bad, and ferocious. Settlers thought wolves would kill so many deer that there wouldn't be any left for them to feed their families. They were also afraid that wolves would kill all their livestock.

In 1865 people passed bounty laws in Wisconsin. People could kill all the wolves they wanted to, and they were paid money to do so. Bounty laws were changed in 1957, but by then there was not a single wolf left in Wisconsin. At that time, the only wild wolves in North America were in Minnesota, Canada, and Alaska.

In the early 1970's, new wolf packs were found in northern Wisconsin. Where do you think they came from? Minnesota. These new packs needed protection, so in 1975 wolves were added to Wisconsin's endangered species list. In 1979 wildlife biologists began to monitor wolf populations and to study wolves and wolf behavior to learn more about them and what they needed to survive.

How do you follow a wolf around?

Each spring biologists capture adult wolves to put special radio collars around their necks. The radios help biologists follow the wolves around and locate the packs' home sites. During the summer, under cover of darkness, biologists howl near these home sites to learn whether pups are hidden there. Biologists listen carefully to the returned howls because pups howl at a different pitch than adults. In winter, when there is snow on the ground and no leaves on trees, biologists can count how many wolves are in each pack. They count the tracks in the snow or count the animals from an airplane. Tracking also helps biologists learn more about the wolves' territory.

A territory is the space in which wolves live. Wolves live together in family groups called packs, usually 2-15 wolves. Each wolf pack needs about 100 square miles of territory in which to find water, food, shelter, and to raise young. Wolves defend these territories from other wolves by scent marking and by howling. Just like some people mark the edges of their property with signs and fence posts, many animals mark their territory, only they do it by urinating and defecating.

Check out this map of winter wolf distribution to find out where you can find wolves in Wisconsin. You can see some wolf photos from winter wolf surveys in our aerial photo gallery.

They're back!

In 1989, a group of concerned citizens got together with the Department of Natural Resources to develop a Timber Wolf Recovery Plan. The goal of the plan was to work toward having wild wolves roaming northern Wisconsin. Wolf population monitoring was put into action with live-trapping, radio telemetry, winter snow tracking, and summer howl surveys.

Because of the success of recovery efforts, wolves have made a comeback in our state. It is estimated that there are now between 630-680 wolves in Wisconsin (2009), enough that the species was reclassified in Wisconsin from threatened to protected.

If we continue to learn more about wolves and what they need to live, and take proper actions to protect and manage them, wolves will continue to thrive in Wisconsin. And, maybe someday, you'll be lucky enough to hear "the call of the wild."

Bridges: Local, National, and Global Connections Social Studies

Adapted from Marshall University, Huntington, West Virginia, www.teachers.net

Original Author: Meghan Webb

Grade Level: 5

Subject (primary): Social Studies Subject (secondary): Math

Part 1: Varies

Materials: K'nex, handout (attached)

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

EALR 2: ECONOMICS The student applies understanding of economic concepts and systems to analyze decision-making and the interactions between individuals, households, businesses, governments, and societies.

Component 2.1: Understands that people have to make choices between wants and needs and evaluate the outcomes of those choices.

2.1.1 Analyzes the costs and benefits of decisions colonists made to meet their needs and wants. Examples:

EALR 5: SOCIAL STUDIES SKILLS The student understands and applies reasoning skills to conduct research, deliberate, form, and evaluate positions through the processes of reading, writing, and communicating.

Component 5.2: Uses inquiry-based research.

5.2.1 Understands how essential questions define the significance of researching an issue or event.

Component 5.3: Deliberates public issues.

5.3.1 Engages others in discussions that attempt to clarify and address multiple viewpoints on public issues based on key ideals.

Alaska Standards for Culturally Responsive Schools

- 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.
 - 9. Make appropriate choices regarding the long-term consequences of their actions
- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 10. Understand the ecology and geography of the bioregion they inhabit

Procedures

OBJECTIVES:

After completing this activity, students will be able to understand how bridges affect both commerce and transportation locally, nationally, and globally. Students need to know this concept because bridges are vital links to both travel and trade.

TEACHER NOTE:

This activity also continues to meet the five powerful social studies aims because it is challenging and actively involves the students in local, national, and global connections, as well as science, technology, and society.

Students will benefit from visiting local bridges, contact the county and/or forest service to see if any tours can be provided for school groups. Also, this assignment can be implemented outside while on a tour of bridges.

LESSON IMPLEMENTATION:

- 1. Teacher will randomly place students into groups (4-6 students) depending on the amount of materials provided, academic ability, and class size.
- 2. Once the children have settled down, the teacher will prompt the students in a brainstorming session about A. How bridges affect students in their community B. How bridges affect the United States C. How bridges affect the world.
- 3. The teacher should then assist the children in understanding that bridges are a vital link for travel and trade. Brainstorming Question: How would your life be different without bridges? How many bridges have you traveled over in the past week? What other types of transportation would you have to use?
- 4. Once the children understand how bridges are relevant to their lives everyday, the teacher will then explain how each group will calculate the cost of the materials that they will need for building a model bridge.
- 5. Ask the students to give examples of the type of bridge that they would like to build and how their bridge would affect a local, national, or global community. Some of the examples may include: pedestrian bridges, intercostals waterway bridges, river bridges, golf course bridges, trail bridges, skywalks, overpasses, cable stayed bridges, pipe support bridges, industrial bridges, catwalks, etc. (Make sure that the students understand that the type of bridge that they decide to build must

- link commerce and transportation on the local, national, or global level.)
- 6. Once students have thought about the type of bridge that they would like to build briefly introduce the concept of time and money because: Bridge builders not only have to consider the location and function of a bridge, but also its cost and the time needed for building it. The children also need to understand that they cannot skimp on materials because of the potential loss of safety. Keeping on schedule is important too, since people will need to use the completed bridge, and the longer it takes to build the bridge, the more it will cost.
- 7. Give the students 10-15 minutes to make a final group decision on the type of bridge that they would like to build and why they would like to build it. How and why is your bridge meaningful to society? Ask the groups to record their results on the worksheet provided.
- 8. Once the students finish the worksheet and the teacher feels that each group fully understands how bridges are a vital link to local, national, and global connections, let the building and the creativity roll!

ASSESSMENT:

The teacher will be able to evaluate the effectiveness of this activity by the responses documented on the worksheet. When the teacher uses the worksheet as an assessment device, he or she will also be able to see if the students understand how bridges affect local, national, and global travel and trade and how bridges are meaningful to their lives.

Complete

- Student completes the worksheet
- •Illustration of the bridge is not simplistic, but rather detailed and creative

Correct

- Answers to the worksheet are correct and discussed and shared with class
- Student can defend answers if they differ from others

Comprehensive

- Illustration of bridge is thoughtful, thorough and creative
- Student demonstrates understanding of the topic based on the worksheet and illustration

HOMEWORK:

Allow the students to self explore by researching other bridges around the world. Ask the students to then document their discoveries and return with them the next day. The studentsi; material should generate a discussion/learning session for the next day because the information that the children have found will be meaningful to them.

Bridges: Local, Nation, & Global Connections

lude Cost and N	umber of Each Piec	e Used (additio	nal research might	be needed):
<u> </u>				
×				

Illustration of Bridge:

Humans and the Environment Social Studies

Adapted from Tahoma High School

Grade Level: 12

Subject (primary): Social Studies
Subject (secondary): Language Arts

Part 1: 45 minutes Part 2: 45 minutes

Materials: copies of graphic organizers: Summarizing, Problem Solving, internet access,

newspapers

Washington State Essential Academic Learning Requirements & Grade Level Expectations

EALR 3: GEOGRAPHY The student uses a spatial perspective to make reasoned decisions by applying the concepts of location, region, and movement and demonstrating knowledge of how geographic features and human cultures impact environments.

Component 3.2: Understands human interaction with the environment.

- 3.2.1 Evaluates how human interaction with the environment has affected economic growth and sustainability.
- 3.2.2 Analyzes and evaluates the social and political factors affecting cultural interactions.
- 3.2.3 Analyzes and evaluates current opportunities and obstacles connected with international migration.

Component 3.3: Understands the geographic context of global issues.

3.3.1 Analyzes how the geography of globalization affects local diversity.

EALR 5: SOCIAL STUDIES SKILLS The student understands and applies reasoning skills to conduct research, deliberate, form, and evaluate positions through the processes of reading, writing, and communicating.

Component 5.1: Uses critical reasoning skills to analyze and evaluate positions.

- 5.1.1 Analyzes the short-term and long-term implications of decisions affecting the global community.
- 5.1.2 Evaluates the plausibility of an analysis of decisions affecting the global community.

Component 5.2: Uses inquiry-based research.

5.2.2 Evaluates the breadth of research to determine the need for new or additional investigation when researching an issue or event.

Alaska Standards for Culturally Responsive Schools

- A- Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community.
 - 11. Assume responsibility for their role in relation to the wellbeing of the cultural community and their life-long obligations as a community member.
 - 4. Practice their responsibilities to the surrounding environment
- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 12. Understand the ecology and geography of the bioregion they inhabit

Procedures

OBJECTIVES:

Students will practice communicating with clarity and precision, to build background knowledge of the causes and effects of current environmental issues facing our world: local, international, national.

BACKGROUND & DISCUSSION:

Have the students take a walk around campus, or a park near campus. While walking, have the students reflect on current environmental issues impacting the world today. Have the students create a mental list of issues to bring back to class to discuss.

To prepare students, review the following (consider modeling with a short article):

- a. Thinking skill of summarizing: depending on the articles and issues they choose, students might summarize the article's beginning, middle, and end; the solution, problem, and resolution; or cause and effects.
- b. Key concepts of sustainability and interdependence: revisit students' definition of these concepts from a previous lesson.
- c. Thinking skill of problem solving: framing the situation, identifying the problem, generating and choosing alternatives.
- d. Citing media sources with an online citation generator.

LESSON IMPLEMENTATION:

Part 1: Knowledge Acquisition

- 1. Ask students to predict what environmental issues they might find reflected in the media today.
- 2. Instruct students to individually review the following resources: Seattle Times, NY Times, Washington Post, CNN/MSNBC, BBC, and/or a local newspaper/publication.
- 3. Students should find three different articles that illustrate different environmental issues that are facing our world. (Examples: China air quality, US land use issues, BP oil spill, local watersheds, etc.)
- 4. Distribute Summarizing and Problem Solving graphic organizers.

5. For each article, instruct the students to: A) Write a 1 paragraph summary of the article. B) 1 paragraph explanation of the connection/patterns that exist between the issue and the concepts of sustainability and/or interdependence. C) Identify three potential causes of the problem and three potential solutions with a justification for their solution. D) Cite the article using MLA/APA citation format.

Part 2: Knowledge Presentation

- 1. Each person chooses one of their articles to present in small group. Students should choose an article and issue that is not being shared by another student in their group.
- 2. Each small group presents to the class ONE article that was shared from their small group. Review the thinking skill of finding patterns. Explain that students will be looking for themes that repeat throughout the summaries and proposed solutions for the issues presented.
- 3. Discuss as a class: what issues seemed most critical to students?

CLOSURE/ASSESSMENT:

What are two common themes that you found when listening to the solutions to these issues? Which solution can you apply to your life? How? Responses must be a minimum of 2 pages typed.

Complete

- Timeline for assessment: students will type a 2 page response by the beginning of the next class period
- Students will address the questions above

Correct

- Students are able to defend their answers to the questions
- Typed response is a minimum of 2 pages using MLA formatting

Comprehensive

- Answers show reflectiveness and understanding of the topic
- Students use article to defend their position and cites these facts in their paper

Math

Commercial Salmon Fishing Math

Adapted from Alaska Native Knowledge Network

Original Author: Bobbi Jordan

Grade Level: Secondary

Subject (primary): Math

Part 1: 1-1.5 hour (time may vary depending on student skill level)

Materials: Handouts for students, computers for assessment

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

M1.3 Core Content: Linear functions, equations, and relationships (Algebra, Geometry/Measurement, Data/Statistics/Probability)

Students understand that linear functions can be used to model situations involving a constant rate of change. They build on the work done in middle school to solve systems of linear equations and inequalities in two variables, learning to interpret the intersection of lines as the solution. While the focus is on solving equations, students also learn graphical and numerical methods for approximating solutions to equations. They use linear functions to analyze relationships, represent and model problems, and answer questions. These algebraic skills are applied in other Core Content areas across high school courses.

 M1.3.G Describe the correlation of data in scatterplots in terms of strong or weak and positive or negative.

M1.5. Core Content: Data and distributions (Data/Statistics/Probability)

Students select mathematical models for data sets and use those models to represent, describe, and compare data sets. They analyze the linear relationship between two statistical variables and make and defend appropriate predictions, conjectures, and generalizations based on data. Students understand limitations of conclusions drawn from the results of a study or an experiment and recognize common

misconceptions and misrepresentations.

M1.5.C Make valid inferences and draw conclusions based on data.

Alaska Standards for Culturally Responsive Schools

- **B-** Culturally-knowledgeable students are about to build on the knowledge and skills of local cultural community as a foundation from which to achieve personal and academic success throughout life.
 - 3. Make appropriate choices regarding the long-term consequences of their actions
- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 13. Understand the ecology and geography of the bioregion they inhabit

Procedures

OVERVIEW:

The following unit deals with the commercial fishing of salmon in Alaska from 1970 – 1999. The data is from actual Alaska Department of Fish and Game information from its website, so it can be updated every year if the teacher is interested in doing so. To obtain the information for this unit go to

www.cf.adfg.ak.us/geninfo/finfish/salmon/catval/history/1970-99.htm. Or go to the Alaska Department of Fish and Game homepage at www.adfg.ak.us.

Teachers' Note: For clarification, the Number in Thousands refers to the actual number of salmon harvested – every single fish counted or estimated to be caught. It needs to be noted that the numbers have been truncated and that they are in actual thousands of fish. It is very easy for students to ignore this fact.

The graphing segment of this unit is somewhat complex. It will take students some time to do the graphing by hand, but it can be done. This activity can also be done with the graphing calculator. It makes the graphing easier and gives students some opportunity to learn or practice calculator skills.

BACKGROUND & DISCUSSION:

Salmon is an important resource to Alaskans and people of the Pacific Northwest. The commercial fishing of salmon is a major factor in Alaska's economy. The table below was obtained from the Alaska Department of Fish and Game. This can be easily switched out using information from Washington State. (Discussion can even pertain to Alaska fishermen that dock their boats in Seattle.)

GETTING READY:

The pertinent information is already gathered. Copies of the below information and questions will need to be made for every student.

LESSON IMPLEMENTATION:

1. Begin the class by brainstorming and discussing the financial and cultural importance of the salmon. The class can start with a think-pair-share, Want-

- Know-Learn graphic organizer, or journal entry.
- 2. After discussion, handout the following copies and explain the assignment to the class.

ASSESSMENT:

After completing the above, students will write a brief article describing their findings on salmon fishing. If there is a student website, the articles can be published online to educate their community on the topic. The article will be written for a scientific journal (this type of writing will have already been taught in a prior class).

Complete

- Students will complete worksheets attached
- •Timeline for assessment: students will have their worksheets completed and their brief article typed and ready to turn in by the beginning of the next class period

Correct

- Student answers on the worksheets match those of master copy
- Students are able to defend their answers and summarize their article to the class

Comprehensive

- Answers show reflectiveness and understanding of the topic, salmon
- •Conclusions in article are supported with information from lesson and worksheets
- Article shows a thoroughness of thought and understanding

RESOURCES:

 Alaska Department of Fish and Game www.adfg.ak.us

Salmon Fishing

Name:		
100		
Period:		

Year	Number of salmon	Year	Number of salmon
	harvested in		harvested in
	thousands		thousands
1970	68364	1985	145358
1971	47499	1986	128949
1972	31945	1987	96626
1973	22186	1988	111564
1974	21762	1989	154129
1975	26237	1990	155058
1976	44422	1991	189517
1977	50847	1992	136803
1978	82326	1993	192900
1979	88342	1994	195861
1980	109991	1995	217795

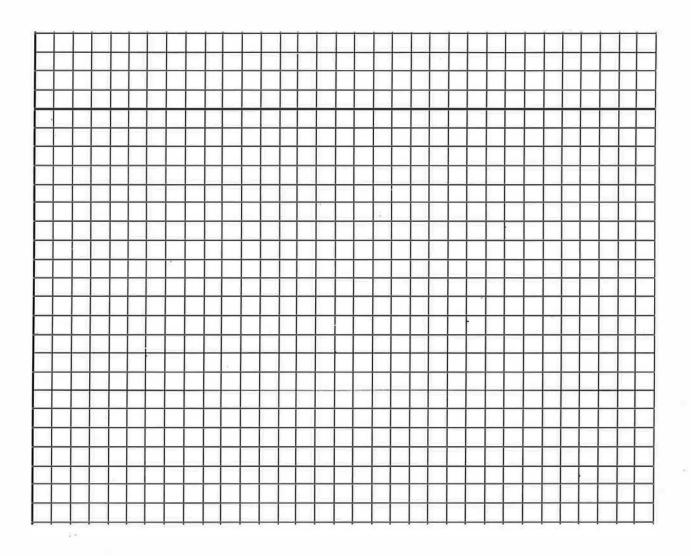
1981	113289	1996	175370
1982	111725	1997	123140
1983	127921	1998	151820
1984	133960	1999	216610

- 1. a) Which year had the least number of fish caught?
 - b) What was the total number of fish harvested that year?
- 2. a) Which year had the greatest number of fish caught?
 - b) How many fish were harvested that year?
- 3. What is the range of the data?
- 4. What is the median number of salmon harvested?

5. Determine the mean number of salmon harvested between 1970 and 1999.

- 6. Is there a mode? Why or why not?
- 7. Which of these measurements best describe the average number of fish harvested from 1970 1999? Explain why you chose this measure of central tendency.

8. Create a scatter plot of the data.



- a. What units of measure best represent the x-axis?
- b. What units of measure best represent the y-axis?

9.	What is the general trend of this data?
10.	Sketch a line of best fit on the same graph as question #10. What is the approximate slope of this line?
11.	What does the slope represent?
12.	What is the y-intercept of this line?
13.	Is the y-intercept useful information? Why or why not?
14.	Use the line of best fit to predict the salmon harvest for 2002.
15.	What conclusions can be made from this scatter plot?

Firefighting Crew Math

Adapted from Alaska Native Knowledge Network

Original Authors: Beth Sukraw

Grade Level: 10-12

Subject (primary): Math

Part 1: 1.5 Hours

Materials: Handout (attached)

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

EALR 1: The student understands and applies the concepts and procedures of mathematics.

Component 1.1: Understand and apply concepts and procedures from number sense.

- 1.1.1 Understand and use scientific notation.
- 1.1.5 Compute using scientific notation.
- 1.1.8 Apply estimation strategies in situations involving multi-step computations of rational numbers using addition, subtraction, multiplication, division, powers, and square roots to predict or determine reasonableness of answers.

Component 1.5: Understand and apply concepts and procedures from algebraic sense.

1.5.2 Determine an equation or rule for a linear function represented in a pattern, table, graph, or model. 1.5.4 Use variables to write expressions, linear equations, and inequalities that represent situations involving rational numbers, whole number powers, and square roots.

EALR 2: The student uses mathematics to define and solve problems.

Component 2.2: Construct solutions.

2.2.1 Select and use relevant information to construct solutions.

EALR 3: The student uses mathematical reasoning.

Component 3.1: Analyze information.

3.1.1 Analyze, compare, and integrate mathematical information from multiple sources.

Component 3.2: Conclude.

- 3.2.1 Draw and support conclusions, using inductive or deductive reasoning.
- 3.2.2 Evaluate procedures and conclusions to make needed revisions.

EALR 4: The student communicates knowledge and understanding in both everyday and mathematical language.

Component 4.2: Organize, represent, and share information.

- 4.2.1 Organize, clarify, and refine mathematical information relevant to a given purpose.
- 4.2.2 Represent mathematical information in graphs or other appropriate forms.
- 4.2.3 Use mathematical language to explain or describe mathematical ideas and information in ways appropriate for audience and purpose.

Alaska Standards for Culturally Responsive Schools

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

14. Understand the ecology and geography of the bioregion they inhabit

Procedures

OVERVIEW:

The following lesson explores the use of statistics to make decisions. Calculations for the mean, median, and mode must be accurate and then used to compare one firefighter to another. The decision as to when to use the mean, median, or mode to pick a firefighter is made and then justified. For example, someone might choose a firefighter whose test score is closest to the mode test score. Then that decision must be explained using reason. The use of the bar graphs when comparing the mean, median, and mode will help with the justification. This emphasizes how geometrically humans think and how important it is to graph information in order to understand it.

BACKGROUND & DISCUSSION:

Every year during the summer, fires flare up in the Pacific Northwest. In Washington state, these fires are usually centralized east of the Cascade Mountain Range. When these fires occur, on-call firefighters throughout the state are alerted and move to control the blaze. (Occasionally, firefighters from other states are called out-of-the region. For example, when California fires grow too large, firefighters from around the neighboring states come to help fight the flames.)

Questions for discussion:

- 1. Have you, or anyone you've known fought forest fires?
- 2. What are the differences between house/structural fires and forest fires?
- 3. Who do you think is in more danger, why?
- 4. Have you ever seen a forest fire?

LESSON IMPLEMENTATION:

In order to gain the fullest benefits of this lesson (could be extended into an entire unit dealing with forest fires), it might behoove the teacher to contact the Department of Natural Resources, or another department that deals with forest fires and firefighters, to bring onto campus and speak to the student. Or, to meet the students at an old fire and speak to them about fire ecology.

- 1. Guest speaker, if available
- 2. Open with a background and discussion (above)

- 3. Students are to complete the math problems (attached)
- 4. Once completed, have the students pair-share their findings and articulate a defense for their fire crew

ASSESSMENT:

The teacher will complete the assignment before the students and write up a key for the lessons. Although students can argue a number of crews, they will have to defend their decision using the data provided and therefore, defend their grade. A class discussion will follow to determine which crew would be the best and prove why through their calculations.

Complete

- Timeline for assessment: students will complete the worksheets in class, homework if they work well but run out of time
- Student attempted to answer all the questions

Correct

- Student answers match those of the key
- Students are able to defend their answers and show their work

Comprehensive

- Answers show reflectiveness and understanding of the topic
- In class discussion, students are able to demonstrate their new knowledge of fire crews and defend their choice for best crew

EXTENDED LEARNING/OUTDOOR EDUCATION:

This lesson lends itself nicely to several extended learning opportunities. If the school is located near enough to a forest fire, a trip can be conducted to survey the effects of fire on an ecosystem. Ideally, science and math classes can develop a whole unit around a forest fire. For this particular lesson, the class can recreate a forest fire, or simulate a fire, using computer programs and information from the fire and use their firefighter crew to battle the blaze (the information gathered at the fire site can aid in this simulation).

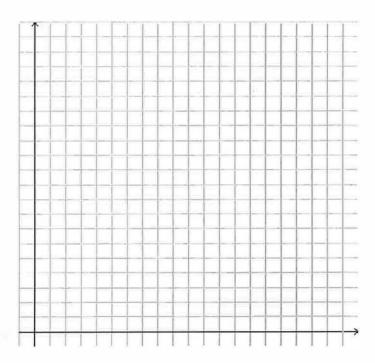
Firefighting Crew

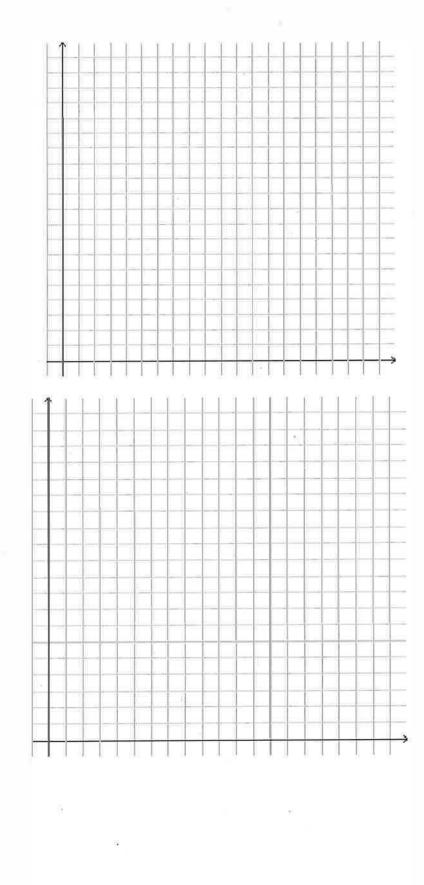
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Period:		

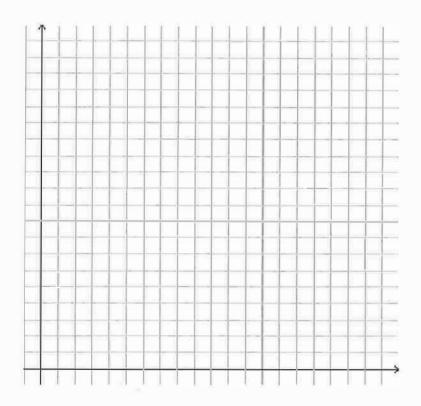
The following are the physical fitness scores, ages, safety test scores and firefighting experience of 10 firefighters. You are to pick 5 of the best for a crew using the statistics you calculate. Below is a table of data for each firefighter.

Firefighters	Number of years of firefighting experience	Age in years	Safety test score	Time on the 3- mile 45-pound pack test in minutes
Α	10	30	Minimum	35
В	5	45	Minimum	40
С	2	22	Above minimum	35
D	2	28	Maximum	30
Е	15	44	Minimum	35
F	4	38	Above minimum	38
G	11	45	Maximum	42
Н	8	35	Maximum	40
ı	8	30	Maximum	38
J	1	19	Minimum	32

1. Graph the data given on 4 separate graphs. Create one bar graph for each category: number of years firefighting experience, age in years, score on safety test, and time for the 3-mile 45-pound pack test.







2. Find the mean, median, and mode for the number of years of firefighting experience.

3. Find the mean, median, and mode for the age in years.

4. Find the mean, median, and mode for the score on safety test. Note: Use 1, 2, and 3 to calculate for minimum, above minimum, and maximum.

5. Find the mean, median, and mode for the 3-mile 45-pound pack test.

- 6. Designate the mean of each category on the correct category's grid by marking the mean with an X and then drawing a horizontal line parallel to the horizontal axis through the X across the entire graph. Include this symbol X in the legend of your graph. An example is X = arithmetic mean.
- 7. Designate the median of each category on the category's grid by marking the median with an O and then drawing a horizontal line parallel to the horizontal axis through the O across the entire graph. Include this symbol O in the legend of your graph. An example is O = median.

8. Designate the mode of each category on the category's grid by marking the mode with a _ and then drawing a horizontal line parallel to the horizontal axis through the _ across the entire graph. Include this symbol _ in the legend of your graph. An example is _ = mode.

9. Using the graphs and the measures of central tendency (mean, median, and mode), pick 5 of the best firefighters to form a crew.

10. Explain why you picked those 5 firefighters as the best using the graphs and measures of central tendency to defend your choices.

Plant Coverage *Math*

Adapted from Alaska Native Knowledge Network

Original Authors: Beth Sukraw

Grade Level: 10-12

Subject (primary): Math

Part One (discussion): Varies

Part Two: Hour

Materials: Handout (attached)

Washington State Essential Academic Learning Requirements & Grade Level Expectations

EALR 1: The student understands and applies the concepts and procedures of mathematics.

Component 1.1: Understand and apply concepts and procedures from number sense.

- 1.1.1 Understand the concept and symbolic representation of real numbers, including rational exponents.
- 1.1.2 Understand the meaning and relative values of real numbers.
- 1.1.7 Apply strategies and uses tools to complete tasks involving computation of real numbers.

Component 1.5: Understand and apply concepts and procedures from algebraic sense.

- 1.5.3 Recognize functional relationships presented in words, tables, graphs and symbols.
- 1.5.6 Solve various types of equations and inequalities numerically, graphically, and algebraically;

interpret solutions algebraically and in the context of the problem; distinguish between exact and approximate answers.

EALR 2: The student uses mathematics to define and solve problems.

Component 2.1: Define problems

2.1.2 Analyze a situation and describe the problem(s) to be solved.

EALR 4: The student communicates knowledge and understanding in both everyday and mathematical language.

Component 4.2: Organize, represent, and share information.

- 4.2.1 Use symbols, diagrams, graphs, and words to clearly communicate mathematical ideas, reasoning, and their implications.
- 4.2.2 Summarize and interpret mathematical information which may be in oral or written formats.
- 4.2.3 Produce mathematically valid oral, written, and/or symbolic arguments to support a position or conclusion, using both mathematical and everyday language.

EALR 5: The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-world situations.

Component 5.3: Relate mathematical concepts and procedures to real-world situations.

5.3.1 Use mathematical ideas and strategies to analyze relationships within mathematics and in other disciplines and real-world situations.

Alaska Standards for Culturally Responsive Schools

- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 15. Understand the ecology and geography of the bioregion they inhabit

Procedures

OVERVIEW:

If possible, call your local botanist and go out into the field or have him/her bring in past records and tools used to record plant coverage in your area. This is a great unit to include local native language for plants. The estimation skills of the guest speakers you bring to class should be emphasized.

BACKGROUND & DISCUSSION:

- 5. During the summer, our local biologists are out in the field studying plants using a similar one meter by one meter square plot sample.
- 6. Discuss native plants with the class. Can they identify any? Why would it be important to predict plant coverage?

LESSON IMPLEMENTATION:

5. After holding a discussion with students, take them outside to part of the school where native plants are. (Oftentimes, schools are build with a greenbelt somewhere attached to the property and/or the groundskeepers plant native plants in landscaping.

ASSESSMENT/ANSWER KEY:

- 1. Finish up the class by having students think/pair/share and then come together as a class and discuss the activity.
- 2. Answer Keys:

Sedge
Moss
Cranberry
Lichen
Other

М	M	М	L	L	L	L	L	L	L
M	М	L	L	L	М	L	L	L.	L L
М	L	L	L	L	М	L	L	L	М
М	L	М	С	М	0	S	L	L	М
М	М	М	С	С	L	L	L	М	М
М	М	М	М	М	М	0	С	С	С
М	М	М	С	S	М	М	М	М	М
М	М	М	С	С	L	L	L	L	L
М	М	М	М	М	М	L	L	L	L
C	С	М	М	М	L	L	L	М	М

Complete

- Timeline for assessment: students will complete the worksheets in class, homework if they work well but run out of time
- Student attempted to answer all the questions

Correct

- Student answers match those of the key
- Students are able to defend their answers and show their work

Comprehensive

- Answers show reflectiveness and understanding of the topic
- In class discussion, students are able to demonstrate their new knowledge of plant coverage

EXTENDED LEARNING/OUTDOOR EDUCATION:

 Contact a local biologist and plan a fieldtrip around native planted areas. Or, contact a nursery and find a native plant specialist and take students to the nursery to get a hands-on view of native plants and their growth habit.

Plant Cover Prediction

Let's explore a plant prediction situation. In one square kilometer you randomly picked one square meter to record as an example of the surrounding vegetation. You and your research team did this for several sites. You will use this chart to make predictions and answer questions. For each problem, show all your work and write your answers in complete sentences.

The following is the square metric chart you recorded. You constructed a key to show the vegetation. If the square has the letter mentioned, it is over 50% of that plant in that 10 cm by 10 cm square.

1.	Make a first prediction of the percentage of each type of plant in the square
	meter. Use no computations. At a glance, what percentage of each type of plant
	do you see?

% Sedge
% Moss
% Cranberry
% Lichen
% Other

2. Find the actual recorded percentages for each type of plant in the square meter.

Plant Type	Tally	Frequency	Percentage Actual	% Estimate from question #1	Difference Estimate- Actual
Sedge					
Moss					
Cranberry					
Lichen					
Other					

3. Suppose the square meter is a good sampling of the square kilometer it came from. Find how much of the area in the square is covered by each type of plant.

Example: If 10% of the square meter is covered by sedges, then

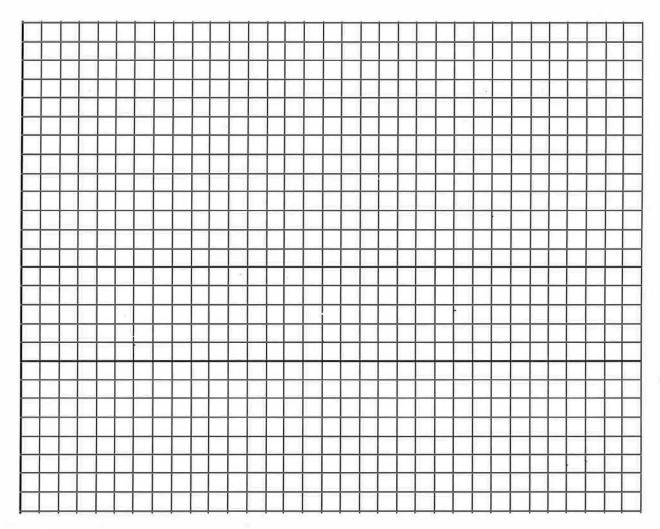
.10		
		X
	=	
1 m ²		$1 \mathrm{km}^2$
1 m ²		1 km ²
1 m ² x = 10,000	m² o	

Keep in mind that, 1 km = 1,000 m

Plant Type	Coverage Area in Square km
Sedge	
Moss	[8]
Cranberry	
Lichen	
Other	

- 4. What is the total area (cm²) covered by cranberries in
 - a. 1,000 square centimeters?
 - b. 2,000 square centimeters?
 - c. 100 square centimeters?
- 5. Write an equation describing the total area covered by cranberries.

6. Construct a graph for the cranberry coverage area. Label the axes and indicate the scale.



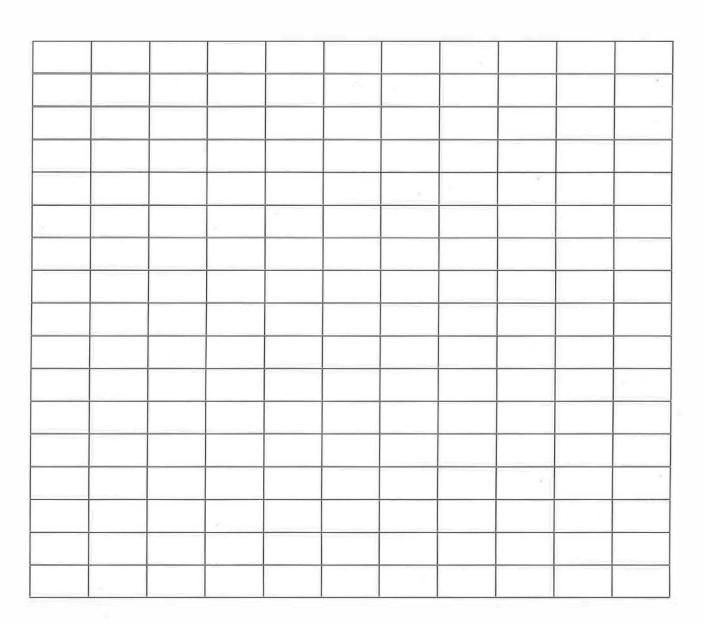
- 7. What if the square meter randomly picked as an example of the surrounding vegetation was a poor example? Explain possible errors and implications.
- 8. How could a sampling area be picked to better exemplify the surrounding area other than randomly?

9. The following table shows the percentage results of 10 more one-meter square samples. Use this data to estimate the overall area covered by each plant in the square kilometer. Round to the nearest tenth of a percent.

	С	S	М	L	0
1	22%	7%	31%	34%	6%
2	21%	1%	36%	38%	4%
3	21%	3%	21%	46%	9%
4	28%	14%	31%	24%	3%
5	20%	11%	48%	9%	12%
6	14%	15%	35%	29%	7%
7	5%	4%	53%	33%	5%
8	19%	9%	41%	25%	6%
9	28%	9%	39%	13%	11%
10	17%	6%	46%	29%	2%

% Moss
% Cranberry
% Lichen
% Other

- 10. Explain any changes that occurred from your group's estimate to the combined averages.
- 11. Create a bar graph to illustrate the estimated area covered by each plant in the square kilometer. Label your axes, create an appropriate scale and give a title to your graph.



Learning is for the Birds! Student Field Guide

Birds of the Pacific Northwest: Introduction, Identification & Characteristics



Name:

Teacher:

ined and are built of light may in the air. Feathers point more streamlined than the ptiles. Most bird bones are holbird's lungs. Even the you eat chicken or duck, look



Aird Wing (Airfoil)

bulling themselves forward like bush air down and back with a slightly turn and fold the birds with great, broad wings ods without flapping. Other to flap fast to stay up. Bird a similar shape. This shape ft.

TRY THIS EXPERIMENT

Hold a piece of paper like this and blow under it.

The force of the wind will push it up.



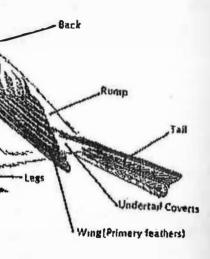
Now blow across the top of the paper and watch it lift.



The slow moving air under the paper forces the paper up through the fast moving air on top of the paper, creating lift.

d

of a bird. When you see a r and shape each part of the aw the bird shown below,
But if you looked at it careack, wings, and tail are brown, nite, its bill, legs, and feet are ally are light gray.



Bird Wings



(

lue. You can also tell a lot shape of its bill.

ender, pointed bills rs, thrushes, and swallows).

e short, stout, cone-shaped g seeds (pine grosbeaks, parrows).

ave strong, straight, chiseling into wood to catch in-

bills for ins, yelpipers).





<u>Ha</u>

Sor

Fish eaters often have long, sharp bills for catching or spearing fish (kingfishers, grebes, loons, and mergansers).



Birds of prey or "raptors" have strong, hooked beaks with sharp edges (eagles, hawks, owls, and shrikes).

ape of its feet are also clues t shapes also provide inforhow it captures its food, place.

gs and toes (yellowlegs and

or grasping. Pressure on the ot causes the toes to lock. That is how chickadees can thout falling off the branch.

s, puffins, and loons have in water. Grebes are also feet are lobed.

e wide-spread toes with curved dpeckers have two toes in so in back. Three-toed wood-toes in front and one in back.

ks, owls, and eagles have ith sharp, hooked claws to

nd juncos often feet have three I one hind toe.



Wing Shapes

Wing shapes are good indicators of flight style. Both wing shape and flight patterns are clues to identification.



<u>Pointed wings</u> are found on fast-flying birds like falcons and swallows.



Short, rounded wings are good for quick takeoff but short flights. Grouse and sparrows have this type of wing.





Long, broad wings are soaring wings like those of hawks and eagles.

ird flys.

teering ws use quick ing insects.



age for ers use en they n of insects.

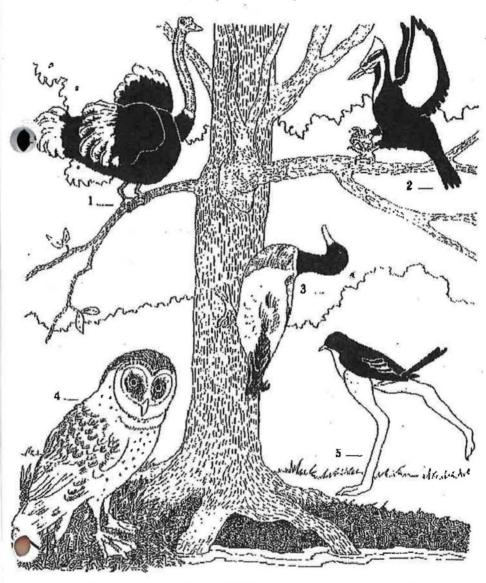


ical of nawks.



Practice!

These birds all have the wrong feet! In the blank next to each bird, write the number that represents the "right" feet.



RANGER RICK'S NATURESCOPE: BIRDS, BIRDS, BIRDS!

Section II

Identification & Characteristics

How to Identify Birds

Hundreds of birds can be found in the Pacific Northwest. Does it seem impossible to ever identify so many birds? Just by learning to recognize a few characteristics, many birds can be easily identified.

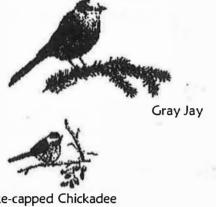
Color:

The color of a bird is important to notice because birds come in all different colors, but birds of the same species can be difint colors. Many birds change colors in the fall and spring. The birds are usually more brightly colored than females, and young birds are often different colors than their parents. These color variations may cause confusion in identification. Although color is important for identification, other characteristics must also be noted. In addition to color, try to note the following things about each new bird you see.

bird, note how big it is. Is it a is it a medium-sized bird like a like a chickadee?



Blake-capped Chickadee



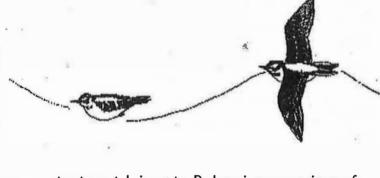
Songs: Songs can be used to locate and identify birds. Some similar birds have very different songs. For example, alder flycatchers look so much like Hammond's flycatchers that you probably couldn't tell them apart if their songs were not so different. When you hear a bird singing, look for it. Birds often sing from places where they can be easily seen.





Behavior: Notice what a bird is doing when you see it. For example, kingfishers perch on a branch over water, then sud-

denly dive straight into the water for fish and frogs. Flocks of swallows often dip



and dive over water to catch insects. Bohemian waxwings often flock together and feed on berries. Flycatchers flit upward from a branch, snatch an insect, then loop back to the same perch. Grebes, loons, mergansers, and puffins dive under water to catch fish. Hawks and eagles often soar. Woodpeckers can be identified by their habit of pecking on trees. They also fly in tain pattern.





otes: Time: iong: Is it singing? What does it sound like? nickadee? ray jay? Draw a picture to answer each of the following questions: ommon raven? 1. What is the birds shaper? 2. What does the bill look like? 3. What do its legs and feet look like? 4. What shape are the wings? 5. What does its tail look like? 23 22

Habitat: Where is it located?

tat: Where is it located? Time: Is it singing? What does it sound like? chickadee? gray jay? raw a picture to answer each of the following questions: common raven? 1. What is the birds shaper? 2. What does the bill look like? 3. What do its legs and feet look like? 4. What shape are the wings? 5. What does its tail look like? 25 24

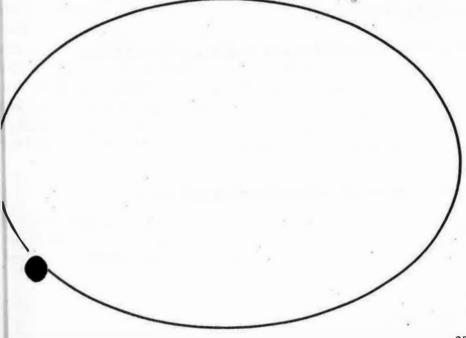
ime:		
	y	
adee?		
jay?		
non raven?		
-		

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 - 5. What does its tail look like?



inges in the earth's magnetic to keep on course. Sunspots fields, are known to confuse s are able to detect very low nces. Low-frequency sounds, inds over mountain ranges and possibly birds use these infra-

riblers, and thrushes migrate e day to feed and rest. Larger migrate by day. Loons, geese, e at night and during the day. It than 7,000 feet, but migrating altitudes over 20,000 feet. 50 miles per hour. Most small niles per hour, while ducks and hour. Migrating sand pipers haver, although 50 to 60 miles per

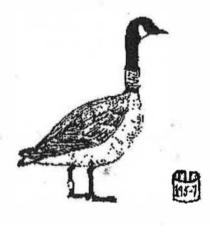
migrate. Can you think of more?

est's resident bird species?

Though birds may be able to survive winter better or find better places to nest by migrating, most migrations are difficult and hazardous journeys. During migration, thousands of birds are killed by storms and by flying into man-made obstructions like TV antennas, towers, skyscrapers, and lighthouses. In addition, as habitat change occurs rapidly throughout the world, migrating birds face more and more difficult times locating safe places to stop over to feed and rest. Drainage of potholes and marshes leaves migrating water birds without places to stop, while many forest areas that were once used by warblers and thrushes are now cities and farms with few trees.



Much of what is known about migration has been learned by bandng birds. Leg bands with numbers are placed on birds so that individuals can be identified. Birds that are anded on the breeding grounds are recaptured during migration or an the wintering grounds (or vice ersa), and thus, we learn where



ifferent birds go to nest and winter. Scientists have found that any birds go to almost the exact same places each year to nest and often go to the same wintering areas each year. In addition to g bands, scientists also use neck collars and tags and sometimes ye birds' feathers so they can be identified from a distance.

tended Learning:

nd out if anyone in your area bands birds. If so, ask him or her to give your ss esentation or find out if you could observe him or her banding birds.



ebirds, ducks, and geese) mibirds (particularly hawks and lone.

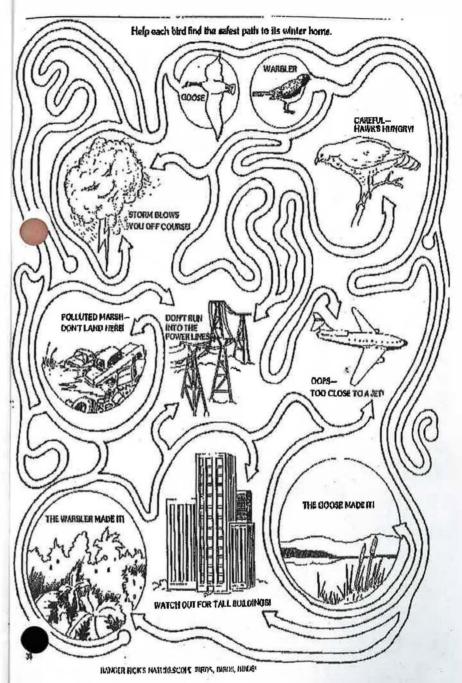
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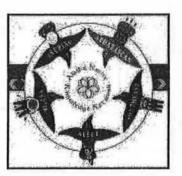
cies. oly a

through your area. Go out on and watch for birds flying od places to watch for migralines, rivers and lakes, through insulas, and from island to is-

bserve migrating birds:

Aigration Map:





Most of the following illustrations, texts, charts, etc. have been adapted from the Alaska Native Knowledge Network curriculum resource webpage. http://ankn.uaf.edu/curriculum/units/Birds1.html

Science

Birds! An Introduction Science

Adapted from Alaska Native Knowledge Network, Iditarod Area School District

Original Authors: Mary Walker of Holy Cross

Grade Level: 5-8 (can be adapted for lower or higher grade levels)

Subject (primary): Science

Part 1: One Hour

Materials: Chicken bone(s), feather(s), Learning is for the Birds! Student Field Guide

(attached)

Washington State Essential Academic Learning Requirements & Grade Level Expectations

<u>EALR 2 — INQUIRY: The student knows and applies the skills, processes, and nature of scientific inquiry.</u>

Component 2.1: Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry. Investigating Systems

Questioning

- 2.1.1 Understand how to generate a question that can be answered through scientific investigation.
- Generate multiple questions based on observations.
- Generate a question that can be investigated scientifically.
- Generate a new question that can be investigated with the same materials and/or data as a given investigation.

Planning and Conducting Safe Investigations

- 2.1.2 Understand how to plan and conduct scientific investigations.
- Make predictions (hypothesize) and give reasons.
- Generate a logical plan for, and conduct, a scientific controlled investigation with the following

attributes:

- prediction (hypothesis)
- appropriate materials, tools, and available computer technology
- controlled variables (kept the same)
- one manipulated (changed) variable
- responding (dependent) variable
- gather, record, and organize data using appropriate units, charts, and/or graphs
- multiple trials
- Generate a logical plan for a simple field investigation with the following attributes:
 - identify multiple variables
 - select observable or measurable variables related to the investigative question
- Identify and explain safety requirements that would be needed in the investigation.

Explaining

- 2.1.3 Apply understanding of how to construct a scientific explanation using evidence and inferential logic.
- Generate a scientific conclusion including supporting data from an investigation using inferential logic (e.g., chewing gum loses more mass than bubble gum after being chewed for 5 minutes; chewing gum lost 2.00 grams while bubble gum only lost 1.47 grams).
- Describe a reason for a given conclusion using evidence from an investigation.
- Generate a scientific explanation of an observed phenomenon using given data.
- Predict what logically might occur if an investigation lasted longer or changed.

Communicating

- 2.1.5 Apply understanding of how to report investigations and explanations of objects, events, systems, and processes.
- Report observations of scientific investigations without making inferences.

Component 2.2: Nature of Science: Understand the nature of scientific inquiry.

Nature of Science

Intellectual Honesty

- 2.2.1 Apply curiosity, honesty, skepticism, and openness when considering explanations and conducting investigations.
- Explain why an honest response to questionable results, conclusions, or explanations is important to the scientific enterprise.

Limitations of Science and Technology

- 2.2.2 Understand that scientific theories explain facts using inferential logic.
- Describe how a principle or theory logically explains a given set of facts.

Evaluating Methods of Investigation

- 2.2.4 Understand how to make the results of scientific investigations reliable and how to make the methods of investigation valid.
- Describe how the method of an investigation ensures reliable results (e.g., multiple trials ensure more reliable results).
- Describe how to increase the reliability of the results of an investigation (e.g., repeating an investigation exactly the same way increases the reliability of the results).

Evolution of Scientific Ideas

- 2.2.5 Understand that increased comprehension of systems leads to new inquiry.
- · Describe how scientific inquiry results in new facts, evidence, unexpected findings, ideas, and

explanations.

• Describe how increased understanding of systems leads to new questions to be investigated.

Alaska Standards for Culturally Responsive Schools

- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 16. Recognize and build upon the inter-relationships that exist among the spiritual, natural, and human realms in the world around them
 - 17. Understand the ecology and geography of the bioregion they inhabit

Note to the Teacher

Targeted grade level is 2/3 but lessons and materials could be adapted for other elementary levels. The actual number of birds studied should be determined by the teacher depending on the ability and interest of the class. The unit could be used at any time of year but there is a greater number and variety of birds during the spring and fall migrations.

Procedures

OBJECTIVES:

- 1) Students will describe the main characteristics of a bird.
- 2) Students will label the different parts of a bird.
- 3) Students will tell why different types of birds have different shaped bodies, wings and tails, beaks, feet and how these adapt each type of bird to its way of life.
- 4) Students will answer the question "How do birds fly?"

LESSON IMPLEMENTATION:

- 1. Brainstorm about "What is a bird?" and how it differs from other animals. What special characteristics enable birds to fly? Refer to the page "How Birds Fly" and have students try the experiment.
- 2. Make a chart to compare birds with another example of local wildlife such as a mouse, squirrel or rabbit. How are they alike; how are they different?
- 3. Have each student draw a bird and label its parts. Look at the sketches of the different types of beaks, feet, wing shapes and tail shapes for different birds [refer to student field guide]. Discuss the purpose/advantage of the variations. Do "Feet Are Neat."
- 4. Discuss why it is important that birds are light in weight. Have students look at chicken bones. (If you soak the bones in vinegar for several weeks beforehand, the bones will be soft enough for the students to cut.) Point out that the hollow bones reduce weight. Struts in some of the bones help strengthen the bones without adding much extra weight.

ASSIGNMENT/ASSESSMENT:

Ask students to collect samples of as many different kinds of feathers as they can find and bring them to school (see other sample lesson plan for a lesson on feathers). Students will work in their workbooks throughout the science lessons, once completed, they will be assessed for completion and correctness.

Complete

- •Timeline for assessment: this is part of a yearlong theme, or unit - therefore, students will have until the end of the unit to complete their Learning is for the Birds! Student Field Guide
- Students will compelte every section that is asked of them in the guide

Correct

- Student answers match those of the key and discussed in class
- •Students are able to defend their answers and show their work

Comprehensive

- Answers show reflectiveness and understanding of the topic
- •In class discussions, which will occur throughout the unit, students are able to demonstrate their new knowledge of birds in the Pacific Northwest

RESOURCES:

Alaska Native Knowledge Network

Bird Identification and Characteristics Science

Adapted from Alaska Native Knowledge Network, Iditarod Area School District

Original Authors: Mary Walker of Holy Cross

Grade Level: 2,3 (can be adapted for lower or higher grade levels)

Subject (primary): Science

Part: Considerable class time will be needed to complete all activities. A bird-friendly area near the school will need to be found, and/or students can take short field trips to the local park, wildlife preserve, etc.

Materials: colored pictures or photographs of a few local birds, sketches of birds for students to color, *Learning is for the Birds! Student Field Guide* (attached)

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- 19. Understand the ecology and geography of the bioregion they inhabit

Note to the Teacher

Targeted grade level is 2/3 but lessons and materials could be adapted for other elementary levels. The actual number of birds studied should be determined by the teacher depending on the ability and interest of the class. The unit could be used at any time of year but there is a greater number and variety of birds during the spring and fall migrations.

Procedures

OBJECTIVE:

- 1. Students will develop their powers of observation and their ability to make inferences by looking for birds and bird signs.
- Students will collect and interpret data about local birds and identify birds both by learning the practices of their elders and by use of field guides and other written sources.
- 3. Students will name and cite identifying characteristics of at least 10 birds which are found locally.

BACKGROUND & DISCUSSION:

Birds were a very important part of the natural world in times past. Game birds formed a necessary part of diet and in times of starvation even the smaller birds helped people survive. Many birds had other important functions as well. For these reasons and also because birds were believed at one time to have had human form, they were highly respected, the indigenous people of the United States had a detailed knowledge of the birds and their habits.

Do not be surprised; however, many people no longer know the names of common birds found around cities, parks, homes, and even in the countryside. They may call them by a descriptive name in English such as "big-eye bird" or "black chicken" or some natives may know them only by their Native names.

When working with classmates, community members, and birding experts to identify birds, students should have not only a picture of the bird but also know something about its behavior and where it is found. Many times birding experts did not have to see a

particular bird to tell what it was. They often identified a bird by what it did - "it's always scratching around" or by its song -"it sounds like a bell", or by where and when it was seen - "first you hear it way back in the woods and then it comes closer and closer to the river as the fish come." (Often Native names were descriptive and told something about the bird.)

LESSON IMPLEMENTATION:

- 1. As an introduction, show the class sketches or photographs of some common local birds and have students name them. Brainstorm to find out the names of other local birds which students know.
- 2. Take a walk with expert birders or other community members looking for birds and bird signs. Ask students to make inferences from their observations of bird signs (i.e. what birds live in the area even though you may not have seen them).

Find out what names community members have for the birds and how they identify them.

Make a class list of birds you have identified.

3. Brainstorm all the different ways a bird can be identified: color, size, habitat, behavior, song. Remember also the shape of bill, feet, wings and tail as noted in Lesson 1. (See student field guide.)

Begin making a large chart for all the birds on your class list. Record as many of the characteristics as you can for each.

4. Discuss the relative size of a raven, a gray jay and a chickadee. Take another walk using the "Field Notes" sheet to record information on each bird you see. Add this information to your chart.

Now look up each bird in a field guide and compare the information about size, color and habitat/range to your own notes. Add any new information to your chart.

5. Draw and/or color pictures of the birds which are found locally. Consult a bird book if necessary for correct coloration.

Make your own local bird book either individually, in groups or as a class. Be sure to include a colored picture, a description of the bird and the name Native tribes in the area gave for each bird.

6. Bird Classification: Birds as well as other living things can be classified in many different ways. If you look in a field guide such as Western Birds, you will find

dozens of categories and subcategories.

The Native people of Alaska (like the Natives in the Pacific Northwest) had their own systems based on the bird characteristics and on where and when they saw the birds. For example, the Dena'ina had categories such as Winter Birds and Summer Birds, Climbing Birds, Scavengers and Nomadics.

Discuss classification with the class and set up a few simple categories of your own. Then have each student divide the birds on the class list into these categories. Discuss the results and make a class chart to show where each bird fits.

7. Bird Population: The local population of some will vary with the seasons but students can learn how to estimate and calculate and consider variables by doing this activity.

Have the class do a bird count at the same hour, for the same length of time, and in the same area on three different days. How many of each species do they count? Set up a chart to show the ratio of one species to another. (You could limit this project to just certain birds such as raven, jay, chickadee.) Then estimate what the population might be in a much larger area.

Speculate on the accuracy of such a study. What are the variables to consider?

ASSESSMENT:

Again, students will be adding to their workbooks. Once completed, they will be assessed based on completion and correctness.

Complete

- •Timeline for assessment: this is part of a yearlong theme, or unit - therefore, students will have until the end of the unit to complete their Learning is for the Birds! Student Field Guide
- Students will compelte every section that is asked of them in the guide

Correct

- •Student answers match those of the key and discussed in class
- •Students are able to defend their answers and show their work

Comprehensive

- Answers show reflectiveness and understanding of the topic
- In class discussions, which will occur throughout the unit, students are able to demonstrate their new knowledge of birds in the Pacific Northwest

Bird Migration *Science*

Adapted from Alaska Native Knowledge Network, Iditarod Area School District

Original Authors: Mary Walker of Holy Cross

Grade Level: 2,3 (can be adapted for lower or higher grade levels)

Subject (primary): Science Subject (secondary): Math

Part: One Hour, Own Migration Map may need additional time

Materials: Learning is for the Birds! Student Field Guide (attached), migration maps of

local birds

Washington State Essential Academic Learning Requirements & Grade Level Expectations

<u>EALR 2 — INQUIRY: The student knows and applies the skills, processes, and nature of scientific inquiry.</u>

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Questioning

- 2.1.1 Understand how to generate a question that can be answered through scientific investigation.
- Generate multiple questions based on observations.
- Generate a question that can be investigated scientifically.
- Generate a new question that can be investigated with the same materials and/or data as a given investigation.

Planning and Conducting Safe Investigations

- 2.1.2 Understand how to plan and conduct scientific investigations.
- Make predictions (hypothesize) and give reasons.
- Generate a logical plan for, and conduct, a scientific controlled investigation with the following

attributes:

- prediction (hypothesis)
- appropriate materials, tools, and available computer technology
- controlled variables (kept the same)
- one manipulated (changed) variable
- responding (dependent) variable
- gather, record, and organize data using appropriate units, charts, and/or graphs
- multiple trials
- Generate a logical plan for a simple field investigation with the following attributes:
 - identify multiple variables
 - select observable or measurable variables related to the investigative question
- Identify and explain safety requirements that would be needed in the investigation.

Explaining

- 2.1.3 Apply understanding of how to construct a scientific explanation using evidence and inferential logic.
- Generate a scientific conclusion including supporting data from an investigation using inferential logic (e.g., chewing gum loses more mass than bubble gum after being chewed for 5 minutes; chewing gum lost 2.00 grams while bubble gum only lost 1.47 grams).
- Describe a reason for a given conclusion using evidence from an investigation.
- Generate a scientific explanation of an observed phenomenon using given data.
- Predict what logically might occur if an investigation lasted longer or changed.

Communicating

- 2.1.5 Apply understanding of how to report investigations and explanations of objects, events, systems, and processes.
- Report observations of scientific investigations without making inferences.

Component 2.2: Nature of Science: Understand the nature of scientific inquiry.

Nature of Science

Intellectual Honesty

- 2.2.1 Apply curiosity, honesty, skepticism, and openness when considering explanations and conducting investigations.
- Explain why an honest response to questionable results, conclusions, or explanations is important to the scientific enterprise.

Limitations of Science and Technology

- 2.2.2 Understand that scientific theories explain facts using inferential logic.
- Describe how a principle or theory logically explains a given set of facts.

Evaluating Methods of Investigation

- 2.2.4 Understand how to make the results of scientific investigations reliable and how to make the methods of investigation valid.
- Describe how the method of an investigation ensures reliable results (e.g., multiple trials ensure more reliable results).
- Describe how to increase the reliability of the results of an investigation (e.g., repeating an investigation exactly the same way increases the reliability of the results).

Evolution of Scientific Ideas

- 2.2.5 Understand that increased comprehension of systems leads to new inquiry.
- Describe how scientific inquiry results in new facts, evidence, unexpected findings, ideas, and

explanations.

• Describe how increased understanding of systems leads to new questions to be investigated.

Alaska Standards for Culturally Responsive Schools

- E- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.
 - 20. Recognize and build upon the inter-relationships that exist among the spiritual, natural, and human realms in the world around them
 - 21. Understand the ecology and geography of the bioregion they inhabit

Note to the Teacher

Use of the Learning is for the Birds! Student Field Guide (attached) will be a necessity. This lesson is tied to the first two lessons, "Birds! An Introduction" and "Bird Identification and Characteristics." Although these lessons are numbered, they don't necessarily need to be taught in any order.

Procedures

OBJECTIVE:

- 4. Students will describe what is meant by migration and tell the destination and distance traveled by some of the local birds.
- 5. Students will list which birds are common around their community in each season of the year.

BACKGROUND & DISCUSSION:

Begin the class by discussing the following, more information can be found in the student field guide. Bird migration is one of the most fascinating and mystifying of natural occurrences. Other birds migrate thousands of miles. Arctic terns are the long distance migration champions; they migrate south from nesting areas at the northernmost tip of the United States--Barrow, Alaska--to winter in Antarctica, some 10,000 miles south.

What causes birds to migrate? Clearly, birds leave a colder place in winter to visit places where the winter weather is warmer, water is open, and food, particularly insects, is more available. But most birds begin migrating south before the temperature drops or food is scarce. As a general rule, birds from the far north "leapfrog" past birds of their own species during migration to winter in areas farther south; thus, they travel farther than seems necessary to find better weather and food.

Scientists have found that in most birds the urge to migrate is caused by changes in day length. However, some birds like crossbills and waxwings migrate in some years but not others. Apparently, these birds get the urge to migrate only when the weather is exceptionally cold or food is scarce.

For many years, biologists have been trying to figure out how birds are able to find their way during migration. Different birds seem to use different methods, and even an

individual bird may use different methods under different weather conditions or in different areas. Many birds use the moon, sun, and stars to find their way. Scientists have found that birds will try to migrate in the wrong direction in a planetarium if the pattern of sun, stars, and moon in the planetarium sky are changed. Many birds follow mountain ranges, sea coasts, and rivers during migration.

LESSON IMPLEMENTATION:

- 1. Discuss the meaning of "migration". Why do birds migrate? Study migration maps as available. Map migration patterns for several local birds.
- List the dangers birds may face during their long journeys. Do the "Copycat Page -Migration Maze".
- 3. Make your own maze as a class. (This might take considerable time, and may need to be completed during an additional class period.)
- 4. Using the bird list made in Lesson 2, decide in which of the 4 seasons each bird is found locally. Are they permanent residents, summer residents or birds just passing through in fall and spring? Illustrate this information with a chart.

Assessment:

Learning is for the Birds! Student Field Guide will be completed and turned in for assessment.

Complete

- •Timeline for assessment: this is part of a yearlong theme, or unit - therefore, students will have until the end of the unit to complete their Learning is for the Birds! Student Field Guide
- Students will compelte every section that is asked of them in the guide

Correct

- •Student answers match those of the key and discussed in class
- •Students are able to defend their answers and show their work

Comprehensive

- •Answers show reflectiveness and understanding of the topic
- In class discussions, which will occur throughout the unit, students are able to demonstrate their new knowledge of birds in the Pacific Northwest

Physical Education

Orienteering: Map Skills Physical Education

Adapted from Columbia Education Center

Original Authors: Donna Johnson; Wallowa Elementary, OR

Grade Level: K-4 (easily adaptable to higher grades and fitness levels)

Subject (primary): Physical Education Subject (secondary): Outdoor Education

Part 1: One Hour

Materials: A selected course that has been mapped and specific landmarks color coded with crayons or small self-stick circles. Courses may be either familiar or unfamiliar to students depending on the level of difficulty needed to meet student needs. A few possible suggestions may be: the playground, a city park, a wooded area near the school, or a specific rural area the class make take a bus to for a field trip.

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

Health and Fitness EALR 1: The student acquires the knowledge and skills necessary to maintain an active life: Movement, physical fitness, and nutrition.

Component 1.1: Develops motor skills and movement concepts as developmentally appropriate.

- 1.1.1 Applies locomotor, non-locomotor, manipulative, balance, and rhythmic skills in traditional and non-traditional activities that contribute to movement proficiency.
- 1.1.5 Analyzes movement concepts.

Component 1.2: Acquires the knowledge and skills to safely participate in a variety of developmentally appropriate physical activities.

- 1.2.1 Analyzes safety rules and procedures in a variety of physical activities necessary to maintain a safe-learning environment.
- 1.2.2 Applies social skills necessary for effective participation in physical activities.
- 1.2.3 Applies strategies necessary for effective participation in physical activities.

Alaska Standards for Culturally Responsive Schools

- **C-** Culturally-knowledgeable students are able to actively participate in various cultural environments.
 - 22. Attain a healthy lifestyle through which they are able to maintain their own social, emotional, physical, intellectual and spiritual well-being
- D- Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.
 - 1. Engage in a realistic self-assessment to identify strengths and needs to make appropriate decisions to enhance life skills

Procedures

GOAL/OBJECTIVE:

The purpose of this activity is to involve students in map skills in an everyday situation, making the use of maps more real to them.

Students will be able to:

- 1. Use a map to locate six specific landmarks in a given area.
- 2. Individually, and as a group, write a list of how maps and landmarks can help us.
- 3. Write an explanation of how to get from point A to point B to someone unfamiliar to the area.

BACKGROUND & DISCUSSION:

Orienteering is a sport popular in Australia and Sweden and is used as a training activity in the military. In addition, clubs such as Boy/Girl Scouts of America, Camp Fire, etc. teach their members basic orienteering skills. It teaches the participants how to read and use a map. The activity can be adjusted according to grade level by the difficulty of the course and even the use of a compass. Excellent activity for field trips. (Can be used as a culminating activity to an outdoor unit. Or, in advanced cases, the orienteering can take place over several days during a camping trip.)

LESSON IMPLEMENTATION:

- Maps are distributed in classroom and a discussion follows concerning north, south, east, and west and pictures of landmarks. If a compass is used, prior discussion of its use is needed.
- 2. Explain procedure for completing the orienteering activity. Look for six small circles near specific landmarks on your map. When you locate one of the indicated landmarks on the course, you will find a crayon on a string at that spot. Without removing the crayon from the string, fill in the appropriate circle on your map. Complete all six circles in this manner. If you finish the map correctly, each circle will be a different color that will correspond to the map I have already completed.
- 3. You will work with a partner to discuss problems and complete the course. You are responsible for your partners' safety and upon their return to the starting position (students have to return with their partner). Collaborative workers are essential for this activity. Perhaps have a brief discussion with students on working together and list indicators of a collaborative worker.

- 4. If you hear three blows on the whistle, return to the starting point. Students are reminded of safety precautions and to return to the starting point when they have finished the course.
- 5. Pairs of students are sent out in different directions and at different intervals so as not to follow one another or clump together.

Assessment/Closure:

- 1. Check maps with key.
- 2. Brainstorm an individual list and then make a list on the board of how maps and the use of landmarks can help us.
- 3. Write a paragraph describing how to get from the red circle to the yellow circle assuming no one else is familiar to the area.
- 4. Have the student journal after the completion of this activity. Pose questions on difficultly level, cooperative working, etc.
- 5. Discuss how this activity ties into PE. Did the students have to jump, run, etc?

Complete

- Timeline for assessment: students will complete this activity in class
- Students are able to write in their journals at least a paragraph staying on topic

Correct

- Student answers match those of the key
- Students are able to describe how to get from the red circle to the yellow circle to someone that is not familiar to the area

Comprehensive

 Answers show reflectiveness and understanding of the topic



Food Chain Game Physical Education

Adapted from Delta Science Activities

Original Author(s): Melissa Kaplan

Grade Level: K-3

Subject (primary): Physical Education

Subject (secondary): Science

Part 1: 30-40 Minutes

Materials:

For each "Animal":

1 sash (see Preparation)

o 1 sandwich-bag "stomach" (see Preparation)

For the Food:

- o 4-5 liters of popped popcorn
- o 1 data board
- o 1 marking pen
- 1 kitchen timer with bell (or a watch to be used with verbal signals)
 1 roll of 2.54 cm (1") masking tape

Washington State
Essential Academic Learning Requirements
& Grade Level Expectations

Health and Fitness EALR 1: The student acquires the knowledge and skills necessary to maintain an active life: Movement, physical fitness, and nutrition.

Component 1.1: Develops motor skills and movement concepts as developmentally appropriate.

- 1.1.1 Applies locomotor, non-locomotor, manipulative, balance, and rhythmic skills
- 1.1.5 Applies movement concepts.

Component 1.2: Acquires the knowledge and skills to safely participate in a variety of developmentally appropriate physical activities.

- 1.2.1 Applies safety rules and procedures in a variety of physical activities necessary to maintain a safelearning environment.
- 1.2.2 Applies social skills necessary for effective participation in physical activities.
- 1.2.3 Understands strategies necessary for effective participation in physical activities.

Alaska Standards for Culturally Responsive Schools

- **C-** Culturally-knowledgeable students are able to actively participate in various cultural environments.
 - 23. Attain a healthy lifestyle through which they are able to maintain their own social, emotional, physical, intellectual and spiritual well-being
- D- Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.
 - 24. Engage in a realistic self-assessment to identify strengths and needs to make appropriate decisions to enhance life skills

Procedures

BACKGROUND & DISCUSSION:

The transfer of food from its source, plants, to one or more organisms is called a food chain. (To go deeper, the chain actually starts with photosynthesis – the germination of a seed and the growing of the plant.) This transfer occurs when one organism consumes another. In this game, there are four links to the food chain: plants, grasshoppers, frogs, and hawks. Popcorn represents the plants, and students play the parts of grasshoppers, (plant eaters), frogs (which eat grasshoppers) and hawks (which eat frogs). During each round of the game, the "animals" must get enough to eat and avoid being eaten. In this game, the populations (one kind of organism living in a given area) are so small that the survival of two grasshoppers, two frogs and one hawk (which can fly and find a mate and thus reproduce) represents a "balanced" food chain.

GETTING READY:

You will need at least twelve students for this activity, but more will add excitement to the game. Plan on 30-40 minutes of play time.

Sashes: Obtain three different colors of cloth for sashes. For every three players, make two hopper sashes of one color, one frog sash of another color, and one hawk sash of the third color. (For twelve players, you would need eight hopper sashes, four frog sashes and four hawk sashes.) Each sash should be about a meter long and 6-10 cm wide (2-4").

Stomachs: Make the stomach bags by placing strips of masking tape across each plastic sandwich bag so that the bottom edge of the tape is 4 cm from the bottom of the bag. The top of the tape, then, will be 6.5 cm from the bottom of the bag.

Playing Area: Select a large lawn or other open level area that is suitable for a vigorous game of tag.

LESSON IMPLEMENTATION:

1. Introduce the food chain while still in the classroom or on an outdoor drawing board. Diagram the plants, grasshoppers, frogs, hawks food chain on the data board, and display it to the group. Explain that the transfer of food from plants to one or more

organisms is called a food chain and that you have drawn a food chain of four organisms.

- 2. Introducing the game. Explain to the students that they are going to be playing grasshoppers, frogs and hawks in a food chain game. You may want to use a different food chain for the game, such as corn/mouse/snake/hawk, or plankton/anchovy/salmon/sea lion, or one that the group suggests (perhaps one that includes humans).
- 3. Spreading out the plants. Scatter most of the popped corn over the area, and explain that the popped corn represents plants that grasshoppers eat.
- 4. Assigning parts. Divide the students equally into three groups, and distribute grasshopper sashes to one group, frog sashes to the second group, and the hawk sashes to the third group (you will have some grasshopper sashes left over). Make sure that each youngster knows which animal she is playing. Ask everyone to wear their sash so that it is plainly visible to all the other players, e.g., around their waist, upper arm or head.
- 5. Outlining the rules. Give each "animal" one "stomach." Explain that when the game starts, the grasshoppers will try to eat popcorn plants (put popped corn in their bags), the frogs will try to eat grasshoppers (by tagging them) and hawks will try to eat frogs (also by tagging them). When a frog tags a grasshopper, it takes the grasshopper's "stomach" and the grasshopper player leaves the game. When a hawk tags a frog, it takes the frog's "stomach" and the frog leaves the game. Emphasize that grasshoppers can only feed on the popcorn plants on the ground, and that frogs can only feed on grasshoppers, and hawks can only feed on frogs, and that animals that are eaten must wait on the sidelines. Frogs can eat more than one grasshopper, and hawks can eat more than one frog.) Announce that the round will last five minutes or so or until all of one kind of animal are eaten.
- 6. Play the game. Record the starting population numbers on the data board. State the challenge, set the time for five minutes, then yell "GO!" The first round often lasts only a few seconds because all the hoppers or frogs are quickly eaten.
- 7. Counting survivors. After the first round, record on the data board the number of each kind of animal that obtained enough food to survive. To survive, a grasshopper's stomach must be filled up to the bottom of the tape (4 cm), and a frog's stomach must be filled up to the top of the tape (6.5 cm from the bottom of the bag). Hawks need the equivalent of one frog with a full stomach to survive. Animals with less than a full stomach at the end of the round "starve to death."
- 8. Balancing the food chain. Explain that at least two grasshoppers, two frogs and one hawk must be alive at the end of a five-minute round to have a "balanced" food chain.

Ask the students how they can change the game to produce a balanced food chain. Typical suggestions are: change the number of grasshoppers, frogs and hawks; provide more plants (popcorn); set up safety zones for the grasshoppers and frogs where they are protected from attack; time releases, e.g., grasshoppers forage for thirty seconds before frogs "get up."

- 9. Playing again. Record on the data board the suggestion the group wants to try first, e.g., different numbers of organisms (twenty grasshoppers, eight frogs, two hawks). Make the necessary sash changes, redistribute the "stomach" bags, and return the popped corn to the activity site. Record the starting populations, reset the timer, and let the play begin.
- 10. Adaptation. Allow the players to keep changing the rules and repeating the game until they end up with a balanced food chain. At the end of each round, record the number of survivors on the data board. Encourage the students to compare the results after each round to help them figure out how to balance their food chain.

EXTENDED LEARNING/ASSESSMENT:

Food for Thought:

- 1. What population sizes of grasshoppers, frogs and hawks produced a balanced food chain?
- 2. What might happen if there were only half as many popped corn plants? Twice as many? No plants?
- 3. If there were no frogs, what might happen to the grasshopper population? The plant population? The hawk population?
- 4. What are some food chains that include humans?

Complete

- Timeline for assessment: students will complete this in class and discussion will follow
- Students participate in class

Correct

- Students are able to defend their answers during class discussion
- Students are able to follow the rules of the game

Comprehensive

- Answers show reflectiveness and understanding of the topic
- In class discussions, students are able to demonstrate their new knowledge of the food chain

Orienteering: Scavenger Hunt Physical Education

Adapted from www.pecentral.org

Original Authors: Donna Johnson; Wallowa Elementary, OR

Grade Level: 6-12

Subject (primary): Physical Education Subject (secondary): Outdoor Education

Part 1: One Hour, or more

Materials: Compasses (one for every student), one demonstration compass (either large one or overhead), balloons, poly spots, and direction cards.

Washington State Essential Academic Learning Requirements & Grade Level Expectations

Health and Fitness EALR 1: The student acquires the knowledge and skills necessary to maintain an active life: Movement, physical fitness, and nutrition.

Component 1.1: Develops motor skills and movement concepts as developmentally appropriate.

- 1.1.1 Applies locomotor, non-locomotor, manipulative, balance, and rhythmic skills in traditional and non-traditional activities that contribute to movement proficiency.
- 1.1.5 Analyzes movement concepts.

Component 1.2: Acquires the knowledge and skills to safely participate in a variety of developmentally appropriate physical activities.

- 1.2.1 Analyzes safety rules and procedures in a variety of physical activities necessary to maintain a safe-learning environment.
- 1.2.2 Applies social skills necessary for effective participation in physical activities.
- 1.2.3 Applies strategies necessary for effective participation in physical activities.

Alaska Standards for Culturally Responsive Schools

- **C-** Culturally-knowledgeable students are able to actively participate in various cultural environments.
 - 25. Attain a healthy lifestyle through which they are able to maintain their own social, emotional, physical, intellectual and spiritual well-being
- D- Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.
 - 2. Engage in a realistic self-assessment to identify strengths and needs to make appropriate decisions to enhance life skills

Procedures

GOAL/OBJECTIVE:

The students will take a reading with a compass and use the compass to reach multiple checkpoints.

TEACHER NOTES/PRIOR TO LESSON:

Begin class by telling the students that orienteering is a race to find different control markers hidden in back country using only a map and compass. The first thing they need to learn before orienteering is how to use a compass.

Demonstrate use of a compass with a large demonstration compass or an overhead projector. The students should be able to identify the following compass parts;

- Compass base is the rectangular bottom part of the compass.
- Compass needle or magnetic needle is the red and white arrow that moves. The red part of the needle always points north.
- Compass housing or dial is the turnable dial on the compass. The numbers on the dial refer to degrees of azimuth, or also called a bearing.
- Direction of travel arrow or sighting line is the arrow on the compass base. This is what you point where you want to go.

To use the compass, hold the compass level so the magnetic needle turns freely. Rotate the compass dial to a desired bearing (so the sighting line falls directly on a bearing such as 90 degrees which is east). Hold the compass so that the back of the compass (part of the compass base opposite the direction of travel arrow) is at your belly button. Keeping the back of the compass at your belly button, turn in a circle until the red end of the magnetic needle lines up with zero degrees (north) on the compass dial. The direction of travel arrow now points to the bearing set on your compass. An excellent source of more information:

o www.learn-orienteering.org

Walk the students through the cues and repeat the steps to face different directions and bearings. Practice travelling at specific bearings by setting the compass to a bearing, picking a spot on the gym wall that the directional arrow points to, and walking towards that spot.

After the students have grasped the reading of a compass then you can start them on a Scavenger Hunt. If they need more time learning how to read the compass then you may

want to come back the next day to do the Scavenger Hunt. (This exercise would be best preformed both in the classroom when familiarizing students with compass and in an outdoor setting when executing the lesson.)

LESSON IMPLEMENTATION:

- 6. Set up the scavenger hunt by spreading poly spots around an open field or another outside area.
- 7. Write the following directions on different scraps of paper so that each course is on a different piece of paper:

Course 1	Course 2
120°-10 Steps	300°-8 Steps
240°-10 Steps	60°-8 Steps
0°-10 Steps	180°-8 Steps
Course 3	Course 4
90°-12 Steps	90°-6 Steps
180°-12 Steps	180°-8 Steps
270°-12 Steps	330°-10 Steps
0°-12 Steps	·
Course 5	Course 6
130°-3 Steps	110°-6 Steps
220°-4 Steps	200°-8 Steps
310°-6 Steps	290°-12 Steps
100°-5 Steps	80°-10 Steps

- 8. Fold the paper and put one of these in each balloon. Blow up the balloons and spread them around outside of general space. Putting the course directions in the balloon is optional.
- 9. Begin the activity by having students spilt up into pairs. Stress the fact that they never travel alone! They may be in a team of three if you have an odd number of students in class. One partner goes to a poly spot on the ground and the other partner gets a balloon and meets their partner at the spot. They pop the balloon and get the directions out of it. Make sure they pick the balloon up after they pop it. Each student uses their own compass, but they travel as a team according to the directions. The directions on the sheet of paper will lead them back to where they began--the poly spot.

TEACHING SUGGESTIONS:

- 1. The compass will not be accurate if used next to metal objects such as watches, belt buckles, and metal poles.
- 2. Make sure students pick a reference point on the wall when walking, rather than always watching their compass.

3. Have everyone practice facing different directions/bearings before travelling.

ASSESSMENT/CLOSURE:

- 6. Discuss the activity with students and ask about their experience.
- 7. Was it helpful to have a partner? Why wouldn't people want to be hiking alone in the woods?
- 8. Have students write how many steps away from their poly spot they ended up.
- 9. If students were far away from their poly spot, how did they end up there? Next time, what could they do differently?

Complete

- Timeline for assessment: students will complete during the class period
- Students follow directions for the activity

Correct

- •Students are able to correctly navigate themselves and their partner using their compass
- The students answer the above questions and are able to defend their answers

Comprehensive

 Answers show reflectiveness and understanding of the topic

Helpful Websites

Alaska Native Knowledge Network

Cedarsong Nature School

The Center for Effective Learning

Foxfire Fund Inc.

IslandWood

Summit Preparatory School

www.ankn.uaf.edu

www.cedarsongnatureschool.org

www.thecenter4learning.com

www.foxfire.org

www.islandwood.org

www.summitprepschool.org

Appendix

Alaska Standards for Culturally Responsive Schools

adopted by

Assembly of Alaska Native Educators
Anchorage, Alaska
February 3, 1998
Published by the Alaska Native Knowledge Network

Preface

The following standards have been developed by Alaska Native educators to provide a way for schools and communities to examine the extent to which they are attending to the educational and cultural well being of the students in their care. These "cultural standards" are predicated on the belief that a firm grounding in the heritage language and culture indigenous to a particular place is a fundamental prerequisite for the development of culturally-healthy students and communities associated with that place, and thus is an essential ingredient for identifying the appropriate qualities and practices associated with culturally-responsive educators, curriculum and schools.

For several years, Alaska has been developing "content standards" to define what students should know and be able to do as they go through school. In addition, "performance standards" are being developed for teachers and administrators, and a set of "quality school standards" have been put forward by the Alaska Department of Education to serve as a basis for accrediting schools in Alaska. To the extent that these state standards are written for general use throughout Alaska, they don't always address some of the special issues that are of critical importance to schools in rural Alaska, particularly those serving Alaska Native communities and students.

Through a series of regional and statewide meetings associated with the Alaska Rural Systemic Initiative (with funding provided by the National Science Foundation and the Annenberg Rural Challenge, and administrative support from the Alaska Federation of Natives in collaboration with the University of Alaska), Alaska Native educators have developed the following "Alaska Standards for Culturally-Responsive Schools" for consideration by educators serving Native students around the state. Though the emphasis is on rural schools serving Native communities, many of the standards are applicable to all students and communities because they focus curricular attention on indepth study of the surrounding physical and cultural environment in which the school is situated, while recognizing the unique contribution that indigenous people can make to such study as long-term inhabitants who have accumulated extensive specialized knowledge related to that environment.

Standards have been drawn up in five areas, including those for students, educators, curriculum, schools, and communities. These "cultural standards" provide guidelines or touchstones against which schools and communities can examine what they are doing to attend to the cultural well-being of the young people they are responsible for nurturing to adulthood. The standards included here serve as a complement to, not as a replacement for, those adopted by the State of Alaska. While the state standards stipulate what students should know and be able to do, the cultural standards are oriented more toward providing guidance on how to get them there in such a way that they become

responsible, capable and whole human beings in the process. The emphasis is on fostering a strong connection between what students experience in school and their lives out of school by providing opportunities for students to engage in in-depth experiential learning in real-world contexts. By shifting the focus in the curriculum from teaching/learning about cultural heritage as another subject to teaching/learning through the local culture as a foundation for all education, it is intended that all forms of knowledge, ways of knowing and world views be recognized as equally valid, adaptable and complementary to one another in mutually beneficial ways.

The cultural standards outlined in this document are not intended to be inclusive, exclusive or conclusive, and thus should be reviewed and adapted to fit local needs. Each school, community and related organization should consider which of these standards are appropriate and which are not, and when necessary, develop additional cultural standards to accommodate local circumstances. Terms should be interpreted to fit local conventions, especially with reference to meanings associated with the definition of Elder, tradition, spirituality, or anything relating to the use of the local language. Where differences of interpretation exist, they should be respected and accommodated to the maximum extent possible. The cultural standards are not intended to produce standardization, but rather to encourage schools to nurture and build upon the rich and varied cultural traditions that continue to be practiced in communities throughout Alaska.

Some of the multiple uses to which these cultural standards may be put are as follows:

- 1. They may be used as a basis for reviewing school or district-level goals, policies and practices with regard to the curriculum and pedagogy being implemented in each community or cultural area.
- They may be used by a local community to examine the kind of home/family environment and parenting support systems that are provided for the upbringing of its children.
- 3. They may be used to devise locally appropriate ways to review student and teacher performance as it relates to nurturing and practicing culturally-healthy behavior, including serving as potential graduation requirements for students.
- 4. They may be used to strengthen the commitment to revitalizing the local language and culture and fostering the involvement of Elders as an educational resource.
- 5. They may be used to help teachers identify teaching practices that are adaptable to the cultural context in which they are teaching.
- 6. They may be used to guide the preparation and orientation of teachers in ways that help them attend to the cultural well-being of their students.
- 7. They may serve as criteria against which to evaluate educational programs intended to address the cultural needs of students.
- 8. They may be used to guide the formation of state-level policies and regulations and the allocation of resources in support of equal educational opportunities for all children in Alaska.

Curriculum resources and technical support to implement the kind of learning experiences encouraged by the enclosed cultural standards may be found through the Alaska Native Knowledge Network web site located at http://www.ankn.uaf.edu, or call (907) 474-5897.

Cultural Standards for Students

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 well-being 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;
- 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.
- 7. determine the place of their cultural community in the regional, state, national and international political and economic systems;
- 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 the 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;
- 3. demonstrate an understanding of the relationship between world view and the way knowledge is formed and used;
- 4. determine how ideas and concepts from one knowledge system relate to those derived from other knowledge systems;
- 5. recognize how and why cultures change over time;
- 6. anticipate the changes that occur when different cultural systems come in contact with one another;

- 7. determine how cultural values and beliefs influence the interaction of people from different cultural backgrounds;
- 8. identify and appreciate who they are and their place in the world.

Cultural Standards for Educators

A. Culturally-responsive educators incorporate local ways of knowing and teaching in their work.

Educators who meet this cultural standard:

- 1. recognize the validity and integrity of the traditional knowledge system;
- 2. utilize Elders' expertise in multiple ways in their teaching;
- 3. provide opportunities and time for students to learn in settings where local cultural knowledge and skills are naturally relevant;
- 4. provide opportunities for students to learn through observation and hands-on demonstration of cultural knowledge and skills;
- 5. adhere to the cultural and intellectual property rights that pertain to all aspects of the local knowledge they are addressing;
- 6. continually involve themselves in learning about the local culture.
- B. Culturally-responsive educators use the local environment and community resources on a regular basis to link what they are teaching to the everyday lives of the students.

Educators who meet this cultural standard:

- 1. regularly engage students in appropriate projects and experiential learning activities in the surrounding environment;
- 2. utilize traditional settings such as camps as learning environments for transmitting both cultural and academic knowledge and skills;
- 3. provide integrated learning activities organized around themes of local significance and across subject areas;
- 4. are knowledgeable in all the areas of local history and cultural tradition that may have bearing on their work as a teacher, including the appropriate times for certain knowledge to be taught;
- 5. seek to ground all teaching in a constructive process built on a local cultural foundation.
- C. Culturally-responsive educators participate in community events and activities in an appropriate and supportive way.

Educators who meet this cultural standard:

- 1. become active members of the community in which they teach and make positive and culturally-appropriate contributions to the well being of that community;
- 2. exercise professional responsibilities in the context of local cultural traditions and expectations;
- 3. maintain a close working relationship with and make appropriate use of the cultural and professional expertise of their co-workers from the local community.
- D. Culturally-responsive educators work closely with parents to achieve a high level of complementary educational expectations between home and school.

Educators who meet this cultural standard:

- 1. promote extensive community and parental interaction and involvement in their children's education;
- 2. involve Elders, parents and local leaders in all aspects of instructional planning and implementation;
- 3. seek to continually learn about and build upon the cultural knowledge that students bring with them from their homes and community;
- 4. seek to learn the local heritage language and promote its use in their teaching.
- E. Culturally-responsive educators recognize the full educational potential of each student and provide the challenges necessary for them to achieve that potential.

Educators who meet this cultural standard:

- 1. recognize cultural differences as positive attributes around which to build appropriate educational experiences;
- provide learning opportunities that help students recognize the integrity of the knowledge they bring with them and use that knowledge as a springboard to new understandings;
- 3. reinforce the student's sense of cultural identity and place in the world;
- 4. acquaint students with the world beyond their home community in ways that expand their horizons while strengthening their own identities;
- 5. recognize the need for all people to understand the importance of learning about other cultures and appreciating what each has to offer.

Chapter V

Discussion, Summary, and Conclusions

Discussion

In order to address topics discussed in the literature review, the project has lessons that are designed with nature in mind. Not only are these lessons designed to be implemented in nature, the curricula itself is nature-based.

Meaning, students will be able to learn outside and learn about nature through any number of subjects. In the project, five subject areas are explored and sample lessons are provided; these subject areas are: English, Social Studies, Math, Science, and Physical Education. Although any subject can be tweaked to incorporate elements of ecopsychology and nature, for this project, a manageable number was used in traditional content fields.

The science curriculum was developed as a mini example of Susan Kovalik's yearlong theme. Using native birds from the Pacific Northwest, an entire year's curriculum in one or multiple content fields can be developed entirely from this theme. Incorporating a field guide to be used throughout the quarter, or longer, allows students to monitor their progress and revisit knowledge that has been discussed. Therefore, the development of the *Learning is for the Birds! Student Field Guide* was essential. Kovalik is adamant about the importance of a yearlong theme and states that one can be "the source of curriculum development and sets direction for instructional strategles," (Kovalik,

1994). Because the science lessons blended so well together, it made sense to use them as a mini model of the yearlong theme.

Physical Education classes lend themselves beautifully to outdoor activities. One researcher, Richard Gifford, studies how nature can reduce stress by nature's ability to promote attention in an involuntary manner. When students engage in nature, their stress levels decrease and they are able to focus on tasks and control impulsive behavior. The PE lessons presented encourage students of all age to explore their surroundings. The two lessons pertaining to navigation allow students to work collaboratively in nature. Not only can students get exercise outside, incorporating more lessons interacting with nature will allow students to reduce their stress levels during the school day.

Another connection between the review of the literature and the project deals with the assessments for the lessons. At the end of each lesson plan, there is an assessment which hits all three important elements of setting standards for mastery, which are that any assignment should be: complete, correct, and comprehensive (Kovalik, 1994). These three criteria can be used to development assessment and also to assess student work.

Summary and Conclusions

Research has documented that ecopsychology has the ability to enhance student learning and behavior when built into the curriculum. Lessons designed with spiral curriculum and usage of the ITI Model of teaching further enhance

student learning, development and retention. Traditionally, when students attend school, concepts are taught in a classroom and students repeat these concepts at appropriate times via essays, exams, homework, etc. This document proposes that there is an alternative to this traditional educational system.

Few can dispute that children need time in nature to learn, grow, play, laugh, exercise, and more. Benefits from nature interactions are bountiful. Why not bring these benefits into the classroom and use as a springboard for student learning. Furthermore, spiral curriculum encourages teachers to revisit basic ideas throughout a student's educational career until the student has grasped the formal concept fully. Finally, integrated thematic instruction, allows educators to put into place a yearlong theme from which essentially all learning for the year will derive. Coupled with yearlong themes are better ways to assess student learning using real world examples.

When nature, spiral curriculum, and elements of the ITI Model become part of the educational process and structure, student learning becomes enriched and transforms from traditional textbook learning to active learning and benefits follow. The greatest benefit being an increase in the mental health of the student. This translates into an eager participate in the educational process, a happier and more unified student population, and global citizens educated on the importance of nature and their impact on the world. Improvements on higher-order thinking skills become evident when students work independently or cooperatively on multifaceted, authentic problems and tasks. In order to solve

these comprehensive problems, students hone and strengthen their communication abilities. Ecopsychology driven curriculum teaches content area concepts while achieving state and federal learning targets and standards.

As they begin to incorporate ecopsychology based lesson design, teachers must be prepared to be flexible. Nature herself can be unreliable, and planning for certain lessons will need to follow the seasons. Furthermore, flexibility with the school itself is necessary. Curriculum and learning targets need to align in all lessons, as well as assessments. These issues can be partially addressed by using the existing curriculum presented in Chapter IV.

It is the author's position that abundant and significant research has been made that in order to support a student's mental and biological needs, interaction with nature is critical. Fostering student learning outside the traditional classroom walls is a radical change from direct instruction and traditional teaching and assessment procedures. Training teachers to harness the great potential ecopsychology based curriculum has should become a priority for teacher preparation and should become a factor for school district curriculum adoption. Furthermore, the author recommends for further and follow-up research includes continuing research in the field of ecopsychology and nature's impact on humans, particularly younger children and at-risk youth. Pilot programs dealing with the proposed curriculum are needed to build appropriate programs to meet student needs, academic targets, and school district regulations. These measures will serve to hone the use of best practices within schools and create

successful pilot programs to use as models for adaptation in other schools.

Research on these pilot schools will need to be conducted to monitor their progress and level of success.

Lorraine Anderson, a freelance editor and author, sees nature playing a dynamic role throughout her life, "Nature has been for me, for as long as I remember, a source of solace, inspiration, venture, and delight; a home, a teacher, a companion," (NIEHS, n.d.). Perhaps, through their interaction and increased knowledge acquisition about nature, students will be able to find nature as a place of inspiration, and venture; a place without walls to call home, a companion with many faces, and an endless source of knowledge. It is hoped that this document encourages educators to embrace the exciting position nature can play in education and to take an active role in creating and implementing ecopsychology based curriculum in order to help bridging the gap between classroom and creek.

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