Proposed activities for an environmental education summer camp program

Caitlin Joan Farr

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PROPOSED ACTIVITIES FOR AN ENVIRONMENTAL EDUCATION SUMMER CAMP PROGRAM

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education:
Environmental Education

by
Caitlin Joan Farr
June 2008
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ABSTRACT

A program for a one-week, residential environmental education summer camp for campers aged 12-15 years, for a site in Idyllwild, California was developed. Curriculum was selected from several well-known environmental education guides using the environmental education goals identified by Hungerford and Volk (2005) as the criteria, as well as some specific lessons created. Lessons were correlated to California State Standards in science. This residential program provides a constructivist approach to environmental education using hands-on lessons and activities with the objectives of increasing camper environmental sensitivity and environmental knowledge, comfort in the out-of-doors, and awareness of their surroundings. The evaluation of student journals will help to determine whether or not the program objectives were met.
DEDICATION

This is dedicated to all those people who have supported me throughout this process. To my parents, for without them this would not be possible, to Mike who cheered me on every step of the way, and to Dr. Stoner who continually read and re-read this project, encouraged me to push myself further and has been a continual source of inspiration in the field. Thank you.
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CHAPTER ONE
INTRODUCTION

Many children today have not had the chance to experience nature as children did in previous generations. With increasing use of technologies such as video games and computers, children tend to play indoors and not to have had the opportunity to explore their local environment. Parental fears concerning environmental unknowns, dangerous animals, and suspicious persons also contribute to this trend (Louv, 2006). This project was developed out of my own love for the out-of-doors and my belief that all children should spend more time outside experiencing nature.

The goal of this project was to develop a proposal for a one-week, residential, summer camp program that might allow children, ages 12-15 years, to explore the out-of-doors in a safe and fun way. The program's goal is to give children a chance to learn about the environment while being fully immersed within it. Thus the program for campers will develop camper's environmental sensitivity in order to bring about attitudes that might result in a more environmentally conscious life. In addition, it will enable them to feel comfortable in the out-of-doors,
become knowledgeable of local ecosystems, increase awareness of their surroundings, and acquire some skills to take further action regarding environmental problems.

A constructivist approach to activities is emphasized in all classes throughout the program. A constructivist approach states "learners construct knowledge based on their own personal experiences rather than passively absorbing it" (Garmston & Wellman in DiEnno & Hilton, 2005, p. 15). This type of approach supports acquisition of information in an interesting, hands-on way in order for students to achieve understanding and attitudes (DiEnno & Hilton, 2005). Students will rely on the staff to provide basic information, yet they will mainly use their own daily experiences at the camp to actively create an understanding of the environment around them.

This one-week program is planned for future possible implementation at Astrocamp, an outdoor education facility in Idyllwild, California. The site is located in the San Bernardino National Forest and is within walking distance of numerous mountain trails, beautiful scenery, and educationally relevant locations. The site is approved by the American Camping Association and has five permanent dormitories, over 20 classrooms and labs, a dining hall, two large conference type areas, as well as acres of land.
to use during outdoor programming. Based on my four years of experience at the site, I know that the out-of-doors residential environment will be supportive to this type of program.

This program would differ greatly from the current programs that are run during the beginning of the summer at Astrocamp. In the current summer programs, campers take physical science and astronomy classes and participate in activities such as rock climbing, robotics, scuba and mountain biking. There is a very small amount of environmental education in the current programs. This new environmental education program will be marketed with the other programs, but identified as a separate unique program emphasizing environmental awareness and out-of-doors exploration.

Campers who might attend this program would come from varied backgrounds. Some will have never been to the woods or experienced any type of natural setting. Others will have been fortunate to have experienced a camping trip or day hike with their family or school. Either way, most of the campers who attend the program probably never have been fully immersed in nature for an extended duration of time. Due to the price of the experience, campers will
typically come from upper-middle class families and mainly hail from California, Arizona and Nevada.

Campers will be away from their families and the constraints of living in suburban and urban areas. The local mountain environment will be used to teach about ecosystems, sustainability, and environmentally responsible practices. Hands-on activities, adventure and experiential-based learning will be used to promote excitement about the environment, as well as environmental sensitivity. Campers will be guided through activities by qualified instructional staff. Simple activities such as icebreaker games will begin the program, thus allowing the campers to feel comfortable in their surroundings. Structured classes will then be offered during the day with campers having some required classes and some electives. At night, campers will come together as a group to reflect on the day’s activities. During their experience they will be given some time to explore nature in a structured yet independent way.

Program evaluation will be done by analyzing student journals based on prompts given during specified journaling time. Journals will be looked at for evidence of meeting the program objectives.
In past years, Astrocamp has been empty of campers throughout much of the month of August. Why let this facility go to waste when it can be used for an innovative, weeklong environmental education program? As Madeyski stated, "As natural space and environmental preservation become more important to society, camps stand ready to serve as ideal experiential teaching centers" (2000, p. 28).

This project is driven by the question: "Does immersion in a residential environmental education set of experiences in the out-of-doors increase environmental awareness?"
CHAPTER TWO
REVIEW OF THE LITERATURE

Introduction

In designing an effective residential environmental education program, first the definitions of environmental education are considered. Next the field of outdoor education is reviewed. Following this is an exploration of the benefits of residential environmental education programs and their impact on camper learning. Subsequently research on constructivism is reviewed to provide a supportive learning theory within the program. At the end of each section, the literature findings are applied to the design of an environmental education summer program for campers, aged 12-15 years.

Definitions of Environmental Education

Four different definitions of environmental education are reviewed in this section. Each definition is different and important to the field of environmental education. In 1969 William B. Stapp and his graduate students provided the first definition of environmental education. Stapp et al. wrote, "Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware
of how to help solve these problems, and motivated to work toward their solution" (1969, p. 31).

Stapp et al. proposed that there are four major objectives of environmental education. The first helps people attain "a clear understanding that man is an inseparable part of a system, consisting of man, culture, and the biophysical environment, and that man has the ability to alter the interrelationships of this system" (1969, p. 31). The second is to help obtain "a broad understanding of the biophysical environment, both natural and man-made, and its role in contemporary society" (Stapp et al., 1969, p. 31). The third is to gain "a fundamental understanding of the biophysical environmental problems confronting man, how these problems can be solved, and the responsibility of citizens and government to work toward their solution" (Stapp et al., 1969, p. 31). The fourth and last objective that Stapp et al. believed citizens should acquire was "attitudes of concern for the quality of the biophysical environment which will motivate citizens to participate in biophysical environmental problem solving" (1969, p. 31).

Shortly after Stapp et al. introduced the first definition of environmental education, the U.S. Office of Education's Environmental Education Act provided another
definition of environmental education, stating that "environmental education means the educational process dealing with man's relationship with his natural and manmade surroundings, and includes the relation of population, conservation, transportation, technology, and urban and regional planning to the total human environment" (in Disinger, 2005b, p. 24). This definition is similar to Stapp's definition, yet it includes more specifics concerning our relationship with the environment.

In 1977, The Tbilisi Declaration, a product of the Intergovernmental Conference on Environmental Education, defined environmental education as a lasting education that is receptive to a quickly changing world. If carried out properly, it should prepare individuals by giving them the ability to understand problems, the skills to productively solve those problems and instill in them the sense of responsibility to positively change the future for all mankind (Tbilisi Declaration, 2005, pp. 13-14). The Tbilisi Declaration supported the following categories of environmental education goals: awareness, knowledge, attitudes, skills and participation (2005, p. 15).

In 1996, the Environmental Protection Agency recorded another definition for environmental education:
Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action. (in Disinger, 2005a, p. 30)

These definitions encompass many of the same aspects of environmental education. Though all of the definitions build upon each other, it is important to identify related themes throughout these definitions. The following three themes were chosen as the focus of environmental education throughout the project. First is a basic knowledge of the environment. In order for humans to understand environmental problems in an effort toward forming solutions, they must obtain a general knowledge of the environment, its parts, functions and limits. The second theme is awareness. We as humans need to be aware of our relationship with the environment. We need to understand that what we do in our everyday lives can have a drastic effect on the environment. Thirdly, environmental education is aimed at giving people the skills and abilities to work on environmental problems so that in the future we will be able to lessen our impact on the Earth.
The acquisition of knowledge, awareness and skills are all present in the above definitions. It is these three themes of environmental education on which my project focuses. Given the four definitions above, environmental education for this project is defined as education designed to help understand the connections between humans and the environment, as well as ways to improve these connections.

Understanding Outdoor Education

There are many different definitions and ideas behind outdoor education. The following thoughts from various professionals in the field provide guidance for interpreting outdoor education. This is intended as an introduction to outdoor education and the definitions that will be used as a basis for the project.

In 1958, Donaldson and Donaldson defined outdoor education as “education in, about and for the outdoors” (1958, p. 63). In 1986, Priest, stated that outdoor education is “an experiential process of learning by doing, which takes place primarily through exposure to the out-of-doors” (p. 13). According to Stoner, Clymire and Helgeson, 1989, in the California Outdoor School Curriculum Guide, outdoor education is defined as “the
important facet of environmental education that allows children a unique, firsthand learning opportunity in the out-of-doors” (1989, p. 6). In an article by Disinger, he quoted Swan by stating that outdoor education is “the use of resources outside the classroom for educational purposes” (2005a, p. 19). Although many different definitions of outdoor education exist, one similar theme seems to be incorporated into all of the definitions: outdoor education must take place in the out-of-doors.

Adkins and Simmons stated that “outdoor education is a direct antecedent of environmental education” (2002, p. 2). Adkins and Simmons believed that when these two fields are combined, that “strong and lasting lessons take shape” (2002, p. 2).

In addition to the above definitions, Ford (1986) stated that outdoor education was based on four premises. These premises dovetail with the objectives of environmental education that were given by Stapp et al. (1969). The first is to teach respect for the land. The second is to give people the knowledge necessary for people to make careful choices concerning their “actions on the environment, culture and humanity” (p. 3). The third is to give people the knowledge to leisurely enjoy the out-of-doors. The fourth is to allow people to
understand that outdoor education is a lifetime education and does not just consist of a two-day trip to a national park (1986).

Ford further stated that:

All ages, abilities, socio-economic sectors—all people, in short—can benefit from outdoor education...not only the learner, but also society. The informed voter and citizen can make a bigger impact on social issues involving natural resources if there has been careful education. (1986, p. 3)

According to Stoner, Clymire and Helgeson, “the value of outdoor education is most clearly portrayed through scenes of a desired tomorrow. The environmental actions taken by tomorrow's adults will be patterned on the knowledge, emotions, and skills developed personally during youth” (1989, p. 29).

From the above definitions and ideas concerning outdoor education, one can clearly see outdoor education is unique in that it gives people an opportunity to learn about the world in an out-of-doors setting. A quality outdoor education program, as the one proposed in my project, contains opportunities for students to become respectful of the out-of-doors, supplement their own
classroom learning, and gain knowledge concerning the environment.

Benefits of Residential Environmental Education

Residential environmental education takes place during the school year at what is known as a resident outdoor school and during the summer at a summer camp. A resident outdoor school is defined as “an experience in which students remain at a camp overnight for two or more days” (Millward in Shepard & Speelman, 1985, p. 21). These schools are usually attended by students, their classmates, and their teachers as part of the regular school year. More research has been done concerning residential environmental education programs for children attending as part of a regular school year program than has been done on residential environmental summer camp programs. Therefore, the effectiveness of the residential portion of school programs for environmental education was looked at and applied to a summer camp setting. In the following review of literature, four studies are reviewed that considered the environmentally related benefits of residential environmental education.

One study done in 1994 by Dresner and Gill looked at the Wolf Creek Nature Camp, a two-week summer residential
environmental education program in the Redwood National Park. The goal of the Wolf Creek Nature Camp was to help children become environmentally responsible citizens by creating a program that "integrates awareness of the natural environment, knowledge of environmental concepts and issues, and actions on environmental problems" (1994, p. 1). Twenty-eight campers, aged 10-13 years, attended the camp over two consecutive summers, 1991 and 1992. All campers each summer were given pretest surveys before they arrived at camp and posttest surveys six weeks after the program ended each summer. Participant experience was recorded by students in their personal journals.

Activities at the camp included classes that focused on "environmental awareness, knowledge of ecosystems, and skills in resolving environmental issues" (Dresner & Gill, 1994, p. 4). Activities focused around naturalist activities, hiking, bird watching, and recycling, energy and water themes.

Dresner and Gill (1994) discussed the importance of being away from the pressures of the home/school environment as a defining factor in a camper's experience. They perceived that the scenic location of a residential environmental camp gave children a greater opportunity to gain environmental sensitivity.
Dresner and Gill stated that there was a considerable change in self-reported student behavior in communicating concern over environmental problems to others. The authors noted a self-reported increase in excitement over nature as well as a greater interest in the environment once back at school (1994).

Results of the Dresner and Gill study indicated that all campers were more relaxed in natural settings than prior to the camp. A large number of students showed increased environmentally responsible behavior once they returned home (1994). Five parents reported that they believed their child had talked to others about environmental issues after attending residential camp and tried to inspire them to take environmental action (Dresner & Gill, 1994).

In 1985, a study done by Shepard and Speelman investigated eight residential sessions at 4-H Camp Whitewood in Windsor, Ohio. In total, there were 613 campers, aged 9-14, who participated in the study, with 208 of those campers in the control group. The campers who were in the experimental group were those who chose outdoor education as a specialization during their three-day or five-day session.
One-half of the campers from both groups were given a pretest at the beginning of the session and all of the campers were given a posttest immediately following the session. During the camp, campers took classes that focused on environmental awareness and general ecology (Shepard & Speelman, 1985).

Survey data were analyzed using a Likert scale (Shepard & Speelman, 1985, p. 22). Considerable changes in scores from the pretest to the posttest were present in areas of forest management and observing wildflowers. These were two of sixteen identified areas. The authors suggested that this could "suggest a trend toward positive change in attitude concerning the conservation of natural resources" (Shepard & Speelman, 1985, p. 22). Shepard and Speelman also suggested that a program of at least five days in length seemed "to have a more positive effect on environmental attitude development" (1985, p. 22).

In 2006, Knapp and Benton studied the recollections of information and emotions one year after completing a residential environmental education program. The study was done on a fifth-grade class consisting of 33 students ages 10-11 years, from a school in Idaho. The class attended a five-day residential environmental education program in Yellowstone National Park that focused on hands-on
interactive programs in water ecology and forest management. One year after the program, 10 students were randomly called by phone and interviewed. The interview questions were open-ended and allowed the children to talk about their experiences at the residential site (Knapp & Benton, 2006).

According to the Knapp and Benton (2006), all of the students were still able to vividly recall much information related to the learned content at the site one year prior. Not only did they remember the action, for example a game of camouflage, all of the students were able to explain the environmental message involved with the game. In the evaluation of student answers, they suggested that this residential experience allowed students to not only store information in the form or facts, but rather process the information into a "conceptual representation or knowing" (Knapp & Benton, 2006, p. 173).

In another study done in 1986 by Jordan, Hungerford, and Tomera, the environmentally responsible behaviors of high-school students were considered before and after a six-day residential environmental camp. The study took place at the Touch of Nature Environmental Center at Southern Illinois University in Carbondale, Illinois.
Sixty-two high-school students attending the residential camp were divided into six groups. Three of the groups took classes on environmental issues, stressing mainly awareness. The other three groups also took classes on environmental issues but focused on awareness as well as action strategies. All of the classes took place in the out-of-doors and focused on topics including recreation and resource management, ecology, and environmental issues (1986).

Pre and posttests were given to the students in the study. The results showed that the knowledge level of students in the environmental issues groups did not increase after the study. In the groups where environmental issues and actions were taught, students showed an increase in environmental actions after the study. According to the authors, these results support the idea that just giving people information about environmental problems is not enough; rather people need knowledge of action strategies in order to help solve environmental problems (Jordan, Hungerford, & Tomera, 1986).

As for the residential aspect of the study, the researchers Jordan, Hungerford, and Tomera stated, "A residential EE program may be a good setting in which to
provide those first-hand experiences which can help motivate students to become involved and participate in those actions of which they were already aware" (1986, p. 20). They also acknowledged that a residential camp situation could offer campers a chance to incorporate action strategies into their own daily life and have positive environmental behavior modeled by instructors and or counselors.

Hammerman, the editor of Fifty Years of Resident Outdoor Education: 1930-1980, stated that “the impact of resident outdoor education is indisputable” (1980, p. 89). He went on to state that “environmental education stands not along, not beside, but upon the shoulders of resident outdoor education” (Hammerman, 1980, p. 89). He concluded that by allowing children to live at the residential site where they learn about their surrounding environment, they become immersed in the environment, eventually learning to respect that environment and draw from it, important environmentally sensitive behaviors.

From the above studies one can conclude that students who attend summer residential environmental camp programs and/or environmentally focused resident outdoor schools experience an increased interest in the environment from their time at the specific site. Environmental education
that takes place in a residential school or camp provides children with unique experiences that help to develop positive attitudes and respect for the environment. Children often show greater environmentally responsible behavior once they return home and many also have a change in attitude concerning environmental issues. At sites where action strategies were taught, students showed an increase in environmental actions after the program. Residential sites may also help students to retain and process information due to the comprehensive environment in which they receive the information.

As shown above, the environmental residential program proposed at Astrocamp may enable students to become comfortable and aware of their surroundings in the out-of-doors, knowledgeable of the nearby ecosystems, and inspired to take action in their own lives, ultimately increasing their environmental sensitivity.

Constructivism

In a traditional classroom or learning situations, the teacher stands in front of the class, lectures about a topic and then gives the students a way of showing their newly learned knowledge using a worksheet or a test. A different type of learning occurs with a constructivist
approach. In constructivism, “knowledge is actively constructed by the cognizing subject, not passively received from the environment” (Lerman in Klein and Merritt, 1994, p. 15). “Constructivist learning theories state that learners construct knowledge based on their own personal experiences rather than passively absorbing it” (Garmston & Wellman in DiEnno & Hilton, 2005, p. 15).

Klein and Merritt analyzed environmental education materials and how they fit into a constructivist curriculum. They stated that there are four main components in a successful constructivist lesson. These are: “(a) the introduction of a real life problem by the teacher for the students to resolve, (b) student-centered instruction facilitated by the teacher, (c) productive group interaction during the learning process, and (d) authentic assessment and demonstration of student progress” (1994, p. 16). Klein and Merritt (1994) acknowledged that even though the idea of constructivist teaching is relatively a new idea in classroom teaching, environmental educators have been successfully using constructivist strategies for a long time.

In 2005, DiEnno and Hilton did a study with high school students to “determine whether a teaching methodology based on the constructivist learning theory
would be an effective method for enhancing student retention of environmental material, engendering positive attitudes toward the environment, and engaging students in the learning process" (p. 14). Although this study was not done exclusively in an outdoor school setting, it supports the effectiveness of a constructivist approach.

Fifty-four students from a Colorado high-school participated in the week-long study by DiEnno and Hilton. The students were split up into a constructivist group and a traditional group. The constructivist group consisted of 36 students in grades 10-12. The traditional group consisted of 18 students in grades 10-12. A pretest was given to all the students to "measure knowledge levels, environmental attitudes, and demographic information" (2005, p. 17).

The students in the constructivist group were taught using constructivist teaching methods. Some of their teaching was done outside in a nature preserve. The teacher began each class with an introduction of the information and then students participated in small group work to complete assignments and acquire new information (DiEnno & Hilton, 2005).

The students in the traditional group participated in daily classroom lectures, completed worksheets and were
able to ask questions of the teacher. Students were allowed to do work individually and not share work with others in the class (DiEnno & Hilton, 2005). A posttest was also given immediately after the week, which measured knowledge and attitudes using similar questions to the pretest (DiEnno & Hilton, 2005). The results illustrated that the constructivist group showed a larger gain in knowledge than the traditional group. The constructivist group also had a greater gain in attitude change. DiEnno and Hilton concluded that environmental education using constructivist approaches is successful in increasing knowledge and attitudes toward an environmental issue (2005).

Through a constructivist approach to environmental education, teachers provide the "scaffolding" or support to students (Vermette, 2001, p. 89). Thus allowing them to actively construct their own thoughts and ideas about a subject. Students acquire an understanding of the new information using multiple techniques including group work, hands-on experiments, and inquiry. Students then use their prior knowledge to complement this new information and are able to construct their own understanding of a subject.
A constructivist technique will be used in the proposed environmental education program. The staff will provide the foundations needed for the students to construct their own learning. Classes will focus on hands-on activities in which students can experience what they are learning. Student centered discussions about experiences will be facilitated by staff. The constructivist approach will be central to the program as students are engaged in outdoor experiences, so that they can become knowledgeable, informed and aware of their natural surroundings.

Curriculum Guides Reviewed

For lesson planning on environmental awareness and biological concepts, four well-known curriculum guides were reviewed. In order to develop lessons related to application and action skills, other curriculum guides were considered. In addition, several field guides and websites were considered as supplementary resources in designing lessons.

Each curriculum guide was deliberately selected because the lessons meet the specific goals and characteristics mentioned by Hungerford and Volk (2005). From within each guide, lessons chosen for specific
classes were chosen based on their constructivist
approaches, their usefulness in conveying intended
information, time constraints, outdoor use and age level
appropriateness. The four curriculum guides stressing
environmental awareness and biological skills used were
Project Learning Tree: Pre K-8 Activity Guide (American
Forest Foundation, 2006), Project WILD (Council for
Environmental Education, 2002), Sharing Nature With
Children (Cornell, 1998), and Ranger Rick’s Nature Scope

Project Learning Tree: Pre K-8 Activity Guide

The most recent edition of the Project Learning Tree
(PLT): Pre K-8 Activity Guide stated in the overview, “PLT
helps young people learn how to think, not what to think,
about complex environmental issues” (American Forest
Foundation, 2006, p. 2). PLT has lessons divided into five
sections: diversity, interrelationships, systems,
structure and scale, and patterns of change. Selected
outdoor lessons were considered in the design of the
project.

Project WILD

The Council for Environmental Education published the
most recent edition of the Project WILD: K-12 Curriculum
Activity Guide in 2002. As stated in the book’s preface,
"The goal of Project WILD is to assist students of any age in developing awareness, knowledge, skills and commitment to result in informed decisions, responsible behavior, and constructive actions concerning wildlife and the environment" (2002, p. vi).

The Project WILD book (2002) has lessons divided up into three sections: ecological knowledge, social and political knowledge, and sustaining fish and wildlife resources. Some activities were designed to be taught in an indoors setting, but only those lessons with outdoor activities were considered.

**Sharing Nature with Children**

*Sharing Nature with Children* (Cornell, 1998) was first published in 1979 and is now used by teachers all over the world. Although geared toward a younger audience, this book has important lessons for all ages. The author, Joseph Cornell, shared with the reader his five tenets of outdoor teaching. He stated: "1. Teach less, share more... 2. Be receptive... 3. Focus the child’s attention without delay... 4. Look and experience first... 5. A sense of joy should permeate the experience" (Cornell, 1998, pp. 13-15). Selected outdoor lessons from this book were incorporated into classes at the proposed summer camp based on their relevance to designed classes.
Ranger Rick’s Nature Scope

According to the goal of Ranger Rick’s Nature Scope, the series of curriculum guides published by the National Wildlife Federation, was “dedicated to inspiring in children an understanding and appreciation of the natural world while developing the skills they will need to make responsible decisions about the environment” (1988, p. 1). Within this series the following guides were used: Amazing Mammals Part I and Trees are Terrific. These two guides were chosen because of their relevance to the classes offered at the proposed program.

Curriculum Guides for Application and Action Lessons

Well-known curriculum guides stressing application and action lessons were reviewed for lessons. These included Taking Action (Stoner, 1995), The Energy Sourcebook (Tennessee Valley Authority, 1992), Recycling: Activities for the Classroom (Bowman & Coon, 1978) and Education and Recycling (California Department of Conservation, 1994).

The above mentioned curriculum guides support the goals and objectives of this project. The use of multiple curriculum guides offers staff a variety of different tools and teaching techniques within the lessons. By
aligning the program curriculum with the California State Board of Education Content Standards for Science (California State Board of Education, 2007) campers will be supported in understanding science concepts which may also be taught during the academic year in school.

Two professionals in the field of environmental education, reviewed all of the final lesson plans developed for this project. Feedback from these professionals assured content validity, with reference to the California Board of Education Content Standards for Science. Feedback also verified that selected lessons from curriculum guides as well as those lessons designed and written specifically for this program, met the proposed objectives of the program. These objectives included:

- Students development of environmental sensitivity.
- Increased feeling of comfort in the out-of-doors.
- Increase of student knowledgeable and awareness of their surrounding environment.
- Increased student knowledge of actions that they can take to improve their surrounding environment.
Summary

The literature presented above shows that students who participate in residential environmental education programs tend to show a greater interest in environmental issues and related problems, a greater sense of environmental sensitivity and responsible environmental behavior in their own lives. Incorporating environmental education beliefs and techniques into an outdoor education program has shown to be supportive of campers' acquiring respect for the out-of-doors.

Residential programs have shown that living and learning in a community setting surrounded by wildlife and beautiful scenery result in increased retention rates of environmental information as well as increased emotional growth due to the scenic beauty of the location. Constructivist approaches to teaching environmental education have also shown to be effective in increasing the knowledge and attitude of students. Information gathered from the literature reviewed was used in the design of the proposed environmental education program.
CHAPTER THREE
DESIGN OF PROJECT

The goal of this project was to design a residential environmental education summer camp program that could potentially occur for three, one-week sessions at the site used by Astrocamp in Idyllwild, California. This program would be for use with 100 campers, ages 12-15 years, each week. Student objectives for this program are as follows:

- Students will develop environmental sensitivity.
- Students will feel more comfortable in the out-of-doors.
- Students will become knowledgeable and aware of their surrounding environment.
- Students will learn actions that they can take to improve their surrounding environment.

These objectives would be fostered by environmental education activities using a constructivist learning theory approach. Curriculum was selected from published environmental education curriculum books, as well as new lessons designed and written specifically for the program as needed. Each curriculum guide was deliberately chosen because the lessons meet the specific goals mentioned by Hungerford and Volk (2005).
This project includes a list of daytime classes, elective activities, and evening programs. Also provided are class descriptions with suggested lesson plan resources for each class (Appendix A), unique author designed and written lesson plans specifically for selected classes and activities (Appendix B), and camp schedules (Appendix C). Where applicable, the activities were aligned with the California State Board of Education Content Standards for Science (California State Board of Education, 2007) for sixth through eighth grade.

Program evaluation will be done by collecting student journals that are written using prompts during specified journaling time. In order to help judge the success of the program, student journals will be looked at for evidence of meeting the program objectives. Objectives include the development of camper environmental sensitivity, the development of camper action skills, increase in camper knowledge and awareness of their surroundings, and increase in camper comfort in the out-of-doors.

Each class is intended to be focused around a specific topic or theme, each which meets the goals and objectives of the proposed program. Each class description includes selected resources and lessons chosen from well-known environmental education curriculum guides,
field guides and websites. Some classes include lesson plans that were designed and written specifically for this project (Appendix B).

During staff training, before the program, class lesson plans and suggested resources will be reviewed. The staff will be allowed to develop their own lesson plans based on individual expertise, as long as they are adaptations of intended classes.

The objectives that guided the design of the curriculum for this project were based on goals for environmental education authored by Hungerford and Volk (2005). The first goal level considers whether the curriculum give students enough ecological knowledge to make informed decisions regarding the environment. The second goal level looks at the awareness and action aspect of the curriculum in order to show students the relationship between “quality of life and the quality of the environment” (2005, p. 319). The third goal level examines the development of proficiency needed to explore and solve environmental issues. The fourth goal level looks at whether the curriculum develops the skills needed to take positive action regarding humans’ life within the environment (2005).
The following lesson, written and designed specifically for the project, is examined to show how the lesson adheres to program objectives and constructivist principles. A similar process was completed on all other lessons that were written for and included within the program. This was to ensure that they follow the same objectives and principles previously discussed in the literature review and the design of the project.

Community Service Lesson Plan

OBJECTIVE: Campers will understand the importance of various types of environmentally related community service projects. Campers will design a project that can be implemented in their own home, school or town.

Connections: This lesson meets program objectives by allowing campers to become knowledgeable and aware of their nearby environment and teaching campers several actions that they can take to improve their surrounding environment.

DESCRIPTION: In this class, campers will learn about different environmental service projects that have been done by fellow peers. Campers will then have the chance to work with others in order to design an individual action
project that they can implement in their own home, school or town.


PROCEDURE: Have campers read pages 25-29 in Taking Action (Stoner, 1995). Discuss the various community service projects that were done by students as well as other ideas for projects. Split up campers into small work groups and have each group brainstorm ideas for projects that they can do in their own home, in their school or in their town. Have each camper pick a project that they want to work on. On a piece of paper, have the campers write down ideas for their specific project and ways that they can implement the project.

Connections: This lesson plan complies with the various constructivist teaching principles discussed in the literature review. For example, learning is actively created by the camper through a hands-on experience (Lerman in Klein and Merritt, 1994). In this lesson, the teacher is providing the "scaffolding" by showing campers numerous projects that have been done in the past while continually providing support when needed as the campers create a new and different project (Vermette, 2001, p. 89).
This lesson plan closely follows Klein and Merritt’s list of four parts to a successful constructivist lesson (1994). The first part stated that in the lesson there needs to be a real life problem to solve (Klein and Merritt, 1994). In this lesson, the campers are given the problem of designing an individual action project that they can implement in their own home communities. The second part stated that in the lesson there needs to be support from the teacher (Klein and Merritt, 1994). In this lesson, the teacher gives information about past projects while being available for help when applicable. The third part stated that in the lesson there needs to be group exchange of ideas (Klein and Merritt, 1994). In this lesson, campers form groups to brainstorm ideas for their action project.

Furthermore, this lesson plan meets the goals for environmental education curriculums according to Hungerford and Volk (2005). Hungerford and Volk’s second goal states that the curriculum need to make students aware of the relationship between “quality of life and the quality of the environment” (2005, p. 319). This lesson does this by showing campers previous action projects and what has been done to improve the environment in local communities. Hungerford and Volk’s third goal states that
the curriculum needs to teach students environmental problem solving skills (2005). This lesson teaches and encourages environmental problem solving skills by showing campers previous projects and how these projects successfully combated an environmental problem and then allowing them to design their own project. This lesson also addresses Hungerford and Volk's (2005) fourth goal of giving students action skills needed to take positive action regarding human's life within the environment by allowing them to design and implement their own environmental action project.

**EVALUATION:** Bring the campers together and have them individually discuss the project that they intend to implement. Allow the teacher and other campers to ask questions and give ideas.

**Connections:** Klein and Merritt's fourth part to a successful constructivist lesson includes assessment of student progress (1994). In this lesson, the campers are brought together as a whole class to discuss each campers project. Campers are invited to ask questions and give comments to other campers regarding their project. The teacher also can ask questions of the camper's project.
Program Operation

Campers will be divided by age into groups of approximately 10 members. Campers age 12 and 13 will be grouped together and campers age 14 and 15 will be grouped together. Each group will be supervised by one staff member and will attend each of the 10 required day classes one time during camp. For morning electives, campers will individually choose from four activities, all of which may be repeated. Groups will attend each of the six evening activities one time. During the scheduled rest period/journal time, students will be given one prompt each day for response. All responses will be collected and used for program evaluation. These prompts are listed in the journaling section of Appendix A.

Qualified staff trained in the fields of outdoor and environmental education, as well as child development will teach the program. Staff will be required to fill out an application and have an interview with the camp director. Only staff that meets strict criteria will be hired. Criteria include a background in the field of environmental and outdoor education, experience and competence in constructivist teaching methods, previous success in working with children as shown through positive references, a strong desire to be a part of the program.
and a clean background check. There will be 10 program staff, therefore making the camper:staff ratio 10:1. The staff training will occur one week prior to the start of camp. Staff will be responsible for teaching daily classes and living with students in the dormitories. Each staff member will be responsible for a group of 10 students, all of the same age and sex. Staff will also be responsible for presenting themselves as environmentally responsible adults so that campers can look to them as role models.

Parental concerns regarding the camp will be addressed by allowing the parents to drop off and pick up their children on the first and last days of camp. Parents will be able to see the facility, meet the staff and ask questions regarding the curriculum and daily life at the camp.
CHAPTER FOUR
CONCLUSION AND DISCUSSION

In the past, children have been able to explore nature on their own, with their families or with their friends. This exploration usually led to an increased knowledge and excitement for the natural world around them. In today’s society, children are usually unable to get out and explore nature as they did in the past. Parental fears, lack of open lands and increased reliance on technology all lend themselves to this phenomena (Louv, 2006).

Sadly this comes at a time when it is more crucial than ever to introduce children to the out-of-doors. As the population grows and environmental problems worsen, we need more than ever children who are environmentally sensitive, literate, and aware, and ready to face environmental problems. This also comes at a time when teachers are forced to focus their students on reading and mathematics, rather than science and the environment. Children may not be getting the environmental education needed in order to successfully carry our environment into the next century (Louv, 2006).
Environmental education is important to our future. It is our responsibility now to help children develop environmental literacy and sensitivity so that they can help to maintain the health of our Earth in the years to come (Louv, 2006). Residential environmental education programs, such as the one designed for this project, are one way in which children can gain the knowledge, awareness and skills necessary to help care for our Earth and solve the environmental problems.

Children who develop an environmental sensitivity at a young age will ultimately become the environmental stewards of the future. Exposure to the out-of-doors, local ecosystems, and environmental action skills can help children to become more comfortable and aware of their surroundings and more willing to care about the environment around them (Louv, 2006).

This master’s project was to develop a program that allows campers, ages 12-15 years, to explore the out-of-doors in a safe and fun way while acquiring environmental sensitivity and knowledge. The program’s lessons utilize constructivist approaches, enabling campers to learn about the natural environment using student centered, hands-on approaches that meet California State Board of Education Content Standards for Science.
Another program objective supported by the program is to enable campers to develop the skills needed to take action in their own lives, ultimately resulting in a more environmentally conscious way of living.

Feedback from reviewers regarding lesson plans was used to improve the final version of this project. The first reviewer noted that the objectives were clear and well thought out. They suggested adding a materials section, which was not in the initial lesson plans. The second reviewer brought attention to the evaluation section. She recommended that the actual questions for the staff to ask during and at the conclusion of each lesson be added. She also suggested adding more information into the descriptions of some classes. All of the recommendations and suggestions were used in the project. Both reviewers felt strongly about the importance of this program in developing environmental sensitivity in children.

With planning for this environmental education summer program now finished, the next step is for Astrocamp to advertise and offer this program. There is a critical need to provide outdoor education for today's youth and this program is one step in meeting this need.
APPENDIX A

CLASS DESCRIPTIONS AND RESOURCES
**Required Day Classes**

Application and Action Classes

- Solar Energy
- Organic Gardening
- Recycling Team
- Tracking
- Survival Skills
- Community Service
- Journaling
- Ice Breakers / Initiatives / Low Ropes
- Botany

**Required Day Classes**

Environmental Awareness and Biological Concepts Classes:

- Discovery Hike
- Forestry
- Wildlife Biology
- Ecosystems and Habitats

**Evening Activities**

- Owl Pellets
- Astronomy
- Night Hike
- Paper Making
- Scavenger Hunt
- Organic Cooking

**Electives**

- Free Swim
- Day Hike
- Ropes Course
- Climbing Wall
- Earth Art
Solar Energy

OBJECTIVE: Campers will learn about solar energy through hands-on experiments. Campers will understand how important solar energy and other renewable energy sources are to the future.

DESCRIPTION: Using hands-on experiments, students will learn about solar energy and its current uses. Students will investigate the advantages and disadvantages of solar energy and its importance to our future. Students will build a solar water heater, a model of a solar house and a photovoltaic cell.

RESOURCES / SELECTED LESSONS:


1. If the Sun didn’t Shine..., p. R-1
2. A Little Sunshine in Your Life, p. R-10

CALIFORNIA CONTENT STANDARDS FOR SCIENCE:

Grade 6: 4b: Students know solar energy reaches Earth through radiation, mostly in the form of visible light.
Grade 7: 6f: Students know light can be reflected, refracted, transmitted, and absorbed by matter.
**Organic Gardening**

**OBJECTIVE:** Campers will understand the basics of organic gardening including composting and planting. Campers will actively participate in the care of a camp garden.

**DESCRIPTION:** Campers will first learn about organic gardening and then have the opportunity to care for the Astrocamp garden by planting seeds, weeding and watering. In addition, campers in this class will learn about composting and its use in the garden.

**RESOURCES / SELECTED LESSONS:**


1. As the Worm Churns, p. 79


**CALIFORNIA CONTENT STANDARDS FOR SCIENCE:**

**Grade 6: 5e:** Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.
**Recycling Team**

**OBJECTIVE:** Campers will understand the importance of recycling. Campers will understand recycling methods and participate in a camp-wide recycling project.

**DESCRIPTION:** Campers will learn the basics of waste management and recycling. Campers will then work with staff to promote campus recycling, develop new and more efficient recycling methods around camp, and teach others about recycling. At the end of this class, campers should be able to help implement recycling programs at home and at school.

**RESOURCES / SELECTED LESSONS:**


1. Activity, p. 33
2. Activity, p. 38
3. Activity, p. 48
4. Activity, p. 81


1. Running out of Resources, p. 61
2. Setting up an In-School Recycling Project, p. 86
3. How to Set Up a School Recycling Program, p. 91
Tracking

OBJECTIVE: Campers will identify various animal tracks. Campers will understand more about the animals who leave tracks behind. Campers will make plaster casts of tracks that they discover.

DESCRIPTION: In this introduction to tracking class, campers will learn to identify and interpret animal tracks. Campers will learn about size and shape variation in tracks and ultimately the behavior of the animal being tracked. Plaster casts of tracks will be made so that students can bring them home.

RESOURCES / SELECTED LESSONS:


1. Tracks!, p. 30


1. Tricky Tracks, p. 45

**Survival Skills**

**OBJECTIVE:** Campers will understand proper preparation techniques for outdoor pursuits in order to feel more comfortable. Campers will understand how to use a map and compass, build shelter and fire and obtain food and water.

**DESCRIPTION:** Campers will spend time in the woods learning about survival skills. Campers will learn how to use a map and compass and build a simple shelter and fire. At the end, campers will learn how to safely obtain food and water while in the woods.

**RESOURCES:**


Community Service

OBJECTIVE: Campers will understand the importance of various types of environmentally related community service projects. Campers will design a project that can be implemented in their own home, school or town.

DESCRIPTION: In this class, campers will learn about different environmental service projects that have been done by fellow peers. Campers will then have the chance to work with others in order to design an individual action project that they can implement in their own home, school or town.

RESOURCES: See lesson plans in Appendix B

Journaling

OBJECTIVE: Campers will experience nature through writing.

DESCRIPTION: Every day campers will receive a different journal prompt. Campers will be expected to sit for the allotted time and reflect on this prompt in their journal.

Journal prompts are as follows:

1. Find a big rock and sit on it. Examine the rock. Use your senses to describe the rock. How do you think the rock got to where it is? Make up a story using the rock.

2. Imagine that you are a native animal to this area. Describe your point-of-view, your daily life, and your interactions with other wildlife including humans.

3. In your journal, write about a new animal that you never knew about before camp. Why is this animal unique? Describe this animal’s tracks and habitat.

4. Walk around from tree to tree. Touch the different trees. Listen to the ground beneath your feet. Describe your walk. Discuss what you know about different types of trees.

5. Sit for a while and listen to the sounds of nature. Describe what you hear. Are you comfortable sitting by yourself?

6. Write a rap song about the sun. Why is the sun important? What can we do with the energy that the sun gives off?

7. Create a poem that describes your time at camp. Talk about your encounters with nature and things around you.
8. Discuss three ways things actions that you can do to help the environment once you return home. Discuss three things you can tell your friends about recycling and conservation. Why are these things important?

9. Imagine that you find yourself stuck in the forest for three days by yourself. Describe some techniques that you would use to stay alive.

10. Describe how to set up an organic garden? Talk about composting? Why is eating organic foods important?
Ice Breakers / Initiatives

OBJECTIVE: Campers will have fun meeting fellow group members. Campers will experience teamwork activities.

DESCRIPTION: Campers will participate in this activity on the first day of camp in order to meet and work with their new group members. Teamwork will be stressed as campers participate in ice breaker games and initiative activities.

RESOURCES: See lesson plans in Appendix B.
Botany

OBJECTIVE: Campers will identify local plants. Campers will understand the parts of a plant. Campers will understand pollination and photosynthesis. Campers will gain an appreciation for plants.

DESCRIPTION: Using nature guides, campers will spend time identifying local plants. After identification, campers will learn about the parts of a plant and how they contribute to processes such as pollination and photosynthesis.

RESOURCES / SELECTED LESSONS:


1. Air Plants, p. 123
2. How Plants Grow, p. 179
3. Sunlight and Shades of Green, p. 182


1. Seed Need, p. 98


CALIFORNIA CONTENT STANDARDS FOR SCIENCE:

Grade 6: 5a: Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.

Grade 7: 1a: Students know cells function similarly in all living organisms.

Grade 7: 1d: Students know that mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis.
Grade 7: 5f: Students know the structures and processes by which flowering plants generate pollen, ovules, seeds, and fruit.

Grade 7: 5g: Students know how to relate the structures of the eye and ear to their functions.
Discovery Hike

OBJECTIVE: Campers will meet new group mates. Campers will explore nature using their senses.

DESCRIPTION: This introductory hike will expose campers to new group members as well as the natural environment. Observation skills and “Leave No Trace” (Leave No Trace, Center for Outdoor Ethics, 2007/2008) principles techniques will be learned for future use in other classes. Campers will stop along the trail to participate in activities and games.

RESOURCES / SELECTED LESSONS:


1. Meet a Tree, p. 26
2. Sounds, p. 38
3. Colors, p. 39
4. Micro-Hike, p. 46
5. Still Hunting, p. 112
Forestry

OBJECTIVE: Campers will identify different types of trees. Campers will understand how humans and animals need and use trees. Campers will understand the effects of humans on trees.

DESCRIPTION: Campers will begin by identifying local trees and learning about their leaves, structures, and systems. Throughout various activities, campers will learn how humans and animals need trees and the effect that humans may have on trees and forests.

RESOURCES / SELECTED LESSONS:


1. Trees as Habitats, p. 102
2. Every Tree for Itself, p. 117
3. Pollution Search, p. 153
4. The Closer you Look, p. 263
5. Tree Factory, p. 269
6. Looking at Leaves, p. 273
7. Name that Tree, p. 288


1. Tell-Tale Transpiration, p. 15
2. A Rottin’ Place to Live, p. 41
3. Tree Treats, p. 66

Wildlife Biology

OBJECTIVE: Campers will understand predator and prey concepts. Campers will understand what a food chain is. Campers will understand the needs and adaptations of different animals within the local ecosystem.

DESCRIPTION: Campers will engage in numerous exciting hands-on activities illustrating predator and prey relationships, adaptations and food chains.

RESOURCES / SELECTED LESSONS:


Web of Life, p. 195


1. Predator – Prey, p. 58
2. Food Chain: Pyramid of Life, p. 52


1. Environmental Barometer, p. 77
2. Thicket Game, p. 114
3. Quick Frozen Critters, p. 122
4. Adaptation Artistry, p. 128
5. Muskox Maneuvers, p. 130


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Ecosystems and Habitats

OBJECTIVE: Campers will understand the components of a habitat and an ecosystem. Campers will understand human impacts on ecosystems and habitats.

DESCRIPTION: Campers will learn about habitats and ecosystems by participating in various fun activities. Through these activities, campers will learn how humans impact ecosystems and habitats and what they can do to change this.

RESOURCES / SELECTED LESSONS:


1. Trees as Habitats, p. 102


1. Oh Deer, p. 36
2. Habittracks, p. 35
3. Habitat Lap Sit, p. 61
4. Who Fits Here, p. 64
5. Urban Nature Search, p. 70
6. Microtrek Treasure Hunt, p. 82
7. Move Over Rover, p. 144
8. Improving Wildlife Habitats in the Community, p. 440
CALIFORNIA CONTENT STANDARDS FOR SCIENCE:

Grade 6: 5a: Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.

Grade 6: 5b: Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.

Grade 6: 5c: Students know populations of organisms can be categorized by the functions they serve in an ecosystem.

Grade 6: 5d: Students know different kinds of organisms may play similar ecological roles in similar biomes.

Grade 6: 5e: Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.
Owl Pellets

OBJECTIVE: Campers will dissect an owl pellet using proper dissecting tools. Students will examine and reconstruct owl skeletons. Students will understand an owl’s place in the food chain.

DESCRIPTION: Campers will partner with another camper and dissect an owl pellet. Campers will then reconstruct the skeleton using proper diagrams. Food chains will be diagramed and discussed with an emphasis on the owl’s place within the food chain.

RESOURCES / SELECTED LESSONS:


1. Owl Pellets, p. 100
Astronomy

OBJECTIVE: Students will investigate the night sky using binoculars and telescopes. Students will identify stars, constellations, planets and galaxies. Students will take pictures of celestial objects using a CCD camera.

DESCRIPTION: The sky in Idyllwild, CA is beautifully clear. In this activity, campers will use telescopes and binoculars to view the night sky. In addition, campers will use state of the art CCD cameras to take pictures of objects that they see. Green laser pointers will be used to point out and identify constellations located in the sky.

RESOURCES: See lesson plans in Appendix B.

CALIFORNIA CONTENT STANDARDS FOR SCIENCE:

Grade 8: 4b: Students know that the Sun is one of many stars in the Milky Way galaxy and that stars may differ in size, temperature, and color.
Grade 8: 4c: Students know how to use astronomical units and light years as measures of distances between the Sun, stars, and Earth.
Grade 8: 4d: Students know that stars are the source of light for all bright objects in outer space and that the Moon and planets shine by reflected sunlight, not by their own light.
Grade 8: 4e: Students know the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids.
**Night Hike**

**OBJECTIVE:** Students will experience nighttime sensory games and group demonstrations. Campers will develop an appreciation of the night and an increased awareness of their own surroundings.

**DESCRIPTION:** Hiking in the dark can be an enlightening experience for many children. In this class, campers will get the change to safely explore the night. A hike will be the basis of this class, but stops will be made to play sensory games and watch demonstrations.

**RESOURCES / SELECTED LESSONS:**


1. Bat and Moth, p. 94
2. Watcher of the Road, p. 96
3. Calling Predators, p. 104
4. The Night World, p. 114

**CALIFORNIA CONTENT STANDARDS FOR SCIENCE:**

**Grade 7: 5g:** Students know how to relate the structures of the eye and ear to their functions.
Paper Making

OBJECTIVE: Campers will make paper using a paper press.

DESCRIPTION: Using a paper press, campers will make their own paper that they can bring home to show family and friends. Leaves, flowers and other collected items can be placed into the paper.

RESOURCES / SELECTED LESSONS:


1. Paper Making, p. 224
Scavenger Hunt

OBJECTIVE: Campers will work together to find items on the scavenger hunt.

DESCRIPTION: Campers will be split into teams and given a list of items to find in the out-of-doors. They will then work as a team to find the items on the list. The team that finds all of the items first wins the scavenger hunt.

RESOURCES / SELECTED LESSONS:


1. Scavenger Hunt, p. 76
Organic Cooking

OBJECTIVE: Students will make healthy food using fresh, organic ingredients. Campers will identify ways to incorporate organic ingredients into their meals at home.

DESCRIPTION: In this class campers will learn how to plan and prepare healthy meals using fresh, organic ingredients. Proper cleanliness, safety and food preparation methods will be taught. Produce from the camp organic garden will be used if available. When campers are done with this class, they should be able to prepare an organic meal at home.

RESOURCES: See lesson plans in Appendix B.
**Free Swim**

**OBJECTIVE:** Student will swim, relax and hang out with friends at the pool.

**DESCRIPTION:** This elective class is designed so that campers can take time to relax and cool off by the pool. There will be no formal teaching that occurs in this class. Staff and lifeguards will be present to supervise campers during free swim.

**RESOURCES:** No lesson plan is required for this activity.
Day Hike

OBJECTIVE: Students will explore nature while hiking through the San Bernardino National Forest.

DESCRIPTION: On this hike, campers will head up the May Valley Trail in search of beautiful views. Various exciting natural features will be pointed out along the hike. Once at the top, campers will have a chance to sit and admire the views, take photos or sketch what they see.

RESOURCES:


Ropes Course

OBJECTIVE: Students will participate in various high ropes course elements. Campers will experience teamwork and challenge by choice.

DESCRIPTION: The site used by Astrocamp has five different ropes course elements. These elements include: Powerpole, Skycoaster, Zipline, Catwalk and Vinewalk. Campers will have a chance to experience one or two of the different elements. Teamwork and challenge by choice ideas will be enforced.

RESOURCES: No lesson plan is required for this activity.
Climbing Wall

OBJECTIVE: Campers will climb various routes on the climbing wall.

DESCRIPTION: The site used by Astrocamp is fortunate enough to have an eight route climbing gym. Using an automatic belay system, campers will have a chance to climb many different routes on the wall ranging from easy to extreme. Trained staff will supervise this activity.

RESOURCES: No lesson plan is required for this activity.
Earth Art

OBJECTIVE: Campers will construct nature themed wooden picture frames.

BACKGROUND: This is a chance for campers to be creative. Campers design their own frames using their imagination and objects found in nature. Various art supplies will be available for use and campers will be able to take their frame home at the end of camp.

RESOURCES: See lesson plans in Appendix B.
APPENDIX B

LESSON PLANS DESIGNED FOR OUTDOOR PROGRAM
COMMUNITY SERVICE
LESSON PLAN

OBJECTIVE: Campers will understand the importance of various types of environmentally related community service projects. Campers will design a project that can be implemented in their own home, school or town.

DESCRIPTION: In this class, campers will learn about different environmental service projects that have been done by fellow peers. Campers will then have the chance to work with others in order to design an individual action project that they can implement in their own home, school or town.


PROCEDURE: Have campers read pages 25-29 in Taking Action (Stoner, 1995). Discuss the various community service projects that were done by students as well as other ideas for projects. Split up campers into small work groups and have each group brainstorm ideas for projects that they can do in their own home, in their school or in their town. Have each camper pick a project that they want to work on. On a piece of paper, have the campers write down ideas for their specific project and ways that they can implement the project.
EVALUATION: Bring the campers together and have them individually discuss the project that they intend to implement. Allow the teacher and other campers to ask questions and give ideas.
OBJECTIVE: Campers will have fun meeting fellow group members. Campers will experience teamwork activities.

DESCRIPTION: Campers will participate in this activity on the first day of camp in order to meet and work with their new group members. Teamwork will be stressed as campers participate in ice breaker games and initiative activities.

MATERIALS: Orange cones, long rope, 1ft. long 1 1/2” diameter hollow round tubes, ping pong balls, bucket

PROCEDURE: In this activity it is important to continually stress teamwork to the campers. The following numbered task are in a sequential order that is helpful in building teamwork and cooperation with a new group. At the end of each task, debrief the campers using the questions in the evaluation.

1. Using a roll of masking tape, write out the names of animals, birds, and reptiles on the tape. Rip off the tape into pieces so that there is one word on each piece. Place one piece of the tape onto each campers forehead without them seeing the word written on the tape. Explain that the object of the game is for everyone to figure out what animal, bird or reptile they are. They are to do this by asking other campers yes and no questions.
2. Have students stand on a log or bench. Explain that they are not allowed to speak or mouth words, but may use hand gestures. Tell them that the object of this task is to order themselves by their birth date. Show them where January and December should stand (opposite ends). Once they believe they are in the right position, tell the campers to raise their hands. After all hands are raised, ask them to tell (using voices) the rest of the group what their birth date is.

3. Have all campers stand in a circle. In the middle of the circle, place a loop of rope. Move the rope around so that it is no longer circular, rather it is twisted and distorted. Explain that each camper must grab the rope with their right hand and then stand still. Once everyone has grabbed a part of the rope, tell them to take one large step back. This should make a giant knot with the rope. Explain the object of this activity is to untie the giant knot without letting go of the rope with their right hand. Students may talk with each other, step over and under the rope and use the other hand to maneuver the rope.

4. Have all of the campers stand in a straight line. At one end of the line, put down an orange cone or marker. About 10 feet ahead of the other end of the line place a bucket. Have all of the campers in the line face the far orange cone. Give everyone a tube. Explain that the goal is to get the ping pong ball to travel through the tubes and into the bucket. There are a few rules that they will need to obey. First, once the ball is in their tube, they may not move their feet. Second, the ball must not touch their hands or any other part of their body. Third, they may not throw the ball.
EVALUATION:

Questions for evaluation:

1. Did you group work well together?
2. Did anyone take on a leadership role?
3. Did everyone feel as though their voice was heard?
4. Was there another way to do this task?
5. What would you do differently next time?
OBJECTIVE: Students will investigate the night sky using binoculars and telescopes. Students will identify stars, constellations, planets and galaxies. Students will take pictures of celestial objects using a CCD camera.

DESCRIPTION: The sky in Idyllwild, CA is beautifully clear. In this activity, campers will use telescopes and binoculars to view the night sky. In addition, campers will use state of the art CCD cameras to take pictures of objects that they see. Green laser pointers will be used to point out and identify constellations located in the sky.

MATERIALS: Binoculars, 12” Meade Telescope, Dobsonian Telescope, green laser pointer, star charts, red flashlights

PROCEDURE: Begin by having the students lie on the grass in a circle with their head towards the center. Using a green laser pointer, point out different constellations, stars, galaxies, and planets. Give out star charts and red flashlights to campers. Explain how to use the star charts, binoculars, and telescopes. Pair the students up into groups and allow them to explore the binoculars and telescopes with their partner. Ask them to find various objects in the sky using the different tools. Take the entire group over to the CCD camera and show them how to take pictures of objects in the sky.

EVALUATION: Bring the students together and have them sit in a circle. Ask the students what their favorite object was. Ask them questions about using the binoculars, telescopes and CCD camera. Using a green laser, point out objects in the sky and ask students to identify them.
ORGANIC COOKING
LESSON PLAN

OBJECTIVE: Students will make healthy food using fresh, organic ingredients. Campers will identify ways to incorporate organic ingredients into their meals at home.

DESCRIPTION: In this class campers will learn how to plan and prepare healthy meals using fresh, organic ingredients. Proper cleanliness, safety and food preparation methods will be taught. Produce from the camp organic garden will be used if available. When campers are done with this class, they should be able to prepare an organic meal at home.

MATERIALS: Plates, big bowl, baking tray, small bowls, cutting boards, knives, spoons, forks, oven, stove top, organic produce and other organic ingredients

PROCEDURE: Have campers wash their hands. Explain safety concerns regarding knives and hand washing. Demonstrate how to use a knife. Give out cutting boards and knives. Prepare each meal separately. Divide up preparation tasks to students.

Mango Salsa with Pita Chips:
1 cup chopped organic mango
2 tbs. chopped organic cilantro
1 tsp. organic lime juice,
1/4 cup chopped organic red onion
1 small chopped organic jalapeno
5 whole organic whole-wheat pita breads cut into eight wedges
1 tbs. organic olive oil
Add all ingredients, except olive oil and pita bread, together in a big bowl. Using a spoon put a small smear of olive oil on both sides each piece of pita bread. Place pita bread onto baking tray and put into 350 degree oven for 10 minutes. After 10 minutes, take the pita bread out and dip into mango salsa.

Fruit Kabobs with Yogurt Sauce

1 organic pineapple
3 organic apples
1 pint of organic strawberries
1/2 lb. organic red seedless grapes
1 organic cantaloupe
1 organic honey dew melon
3 organic bananas
3 cups organic plain yogurt
1/4 cup organic honey
20 wooden skewers

Have campers cut up fruit into medium chunks and place into large bowl. Mix yogurt and honey together in a small bowl. Give each camper two wooden skewers and allow them to stick pieces of fruit onto them. Allow each camper to pour a small portion of the yogurt sauce onto his or her plate and have them dip the fruit into the sauce.

EVALUATION: Ask campers the following questions at the end of the activity.

1. What was your favorite thing to make?
2. What new skills did you learn?
3. What are some things you will make for your friends and family once you return home?
EARTH ART
LESSON PLAN

OBJECTIVE: Campers will construct nature themed wooden picture frames.

BACKGROUND: This is a chance for campers to be creative. Campers design their own frames using their imagination and objects found in nature. Various art supplies will be available for use and campers will be able to take their frame home at the end of camp.

MATERIALS: Glue, scissors, recycled colored paper, string, paint, markers, wooden craft sticks, glitter

PROCEDURE: Begin the class by taking a short hike around camp. Ask the kids to collect items for their frame. Items must be on the ground and not picked directly from trees or plants. Guide them in their choosing by picking up objects such as flowers, leaves, and twigs. Using the wooden craft sticks as a base for the frame, allow students to construct their frame using the natural items and other communal materials.

EVALUATION: Have all of the campers gather together in a circle. Ask each camper to show own artwork and explain what natural supplies were used in its creation.
APPENDIX C

CAMP SCHEDULE
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>10:30 A.M. TO 12:30 P.M.</td>
<td>ARRIVAL</td>
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<tr>
<td>12:30 P.M. TO 1:15 P.M.</td>
<td>LUNCH</td>
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<tr>
<td>1:15 P.M. TO 2:30 P.M.</td>
<td>ICE BREAKERS/INITIATIVES/LOW ROPES</td>
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<tr>
<td>2:30 P.M. TO 4:00 P.M.</td>
<td>DISCOVERY HIKE</td>
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<tr>
<td>4:00 P.M. TO 5:00 P.M.</td>
<td>MOVE IN TO DORMS / UNPACK</td>
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<tr>
<td>5:00 P.M. TO 6:00 P.M.</td>
<td>CAMP ORIENTATION</td>
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<tr>
<td>6:00 P.M. TO 7:00 P.M.</td>
<td>DINNER</td>
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<tr>
<td>7:00 P.M. TO 9:00 P.M.</td>
<td>OPENING CAMPFIRE</td>
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<tr>
<td>9:00 P.M. TO 10:30 P.M.</td>
<td>GROUP TIME IN DORMS</td>
</tr>
<tr>
<td>10:30 P.M.</td>
<td>LIGHTS OUT</td>
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<tr>
<td>Time</td>
<td>Activity</td>
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<tr>
<td>7:30 A.M.</td>
<td>RISE AND SHINE</td>
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<tr>
<td>8:00 A.M. TO 8:30 A.M.</td>
<td>BREAKFAST</td>
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<tr>
<td>8:30 A.M. TO 9:00 A.M.</td>
<td>DORM CLEAN UP</td>
</tr>
<tr>
<td>9:00 A.M. TO 11:00 A.M.</td>
<td>REQUIRED CLASS TIME</td>
</tr>
<tr>
<td>11:00 A.M TO 12:30 P.M.</td>
<td>ELECTIVES</td>
</tr>
<tr>
<td>12:30 P.M. TO 1:15 P.M.</td>
<td>LUNCH</td>
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<tr>
<td>1:15 P.M. TO 2:00 P.M.</td>
<td>REST PERIOD/JOURNALING</td>
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<tr>
<td>2:00 P.M. TO 4:00 P.M.</td>
<td>REQUIRED CLASS TIME</td>
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<tr>
<td>4:00 P.M. TO 6:00 P.M.</td>
<td>REQUIRED CLASS TIME</td>
</tr>
<tr>
<td>6:00 P.M. TO 6:45 P.M.</td>
<td>DINNER</td>
</tr>
<tr>
<td>6:45 P.M. TO 7:00 PM.</td>
<td>FREE TIME</td>
</tr>
<tr>
<td>7:00 P.M. TO 9:00 P.M.</td>
<td>EVENING ACTIVITY</td>
</tr>
<tr>
<td>9:00 P.M. TO 10:00 P.M</td>
<td>CAMPFIRE</td>
</tr>
<tr>
<td>10:00 P.M. TO 10:30 P.M</td>
<td>DORM TIME</td>
</tr>
<tr>
<td>10:30 P.M.</td>
<td>LIGHTS OUT</td>
</tr>
</tbody>
</table>
DAILY CAMP SCHEDULE – DEPARTURE SATURDAY

7:30 A.M. RISE AND SHINE
8:00 A.M TO 8:30 A.M. BREAKFAST
8:30 A.M. TO 9:30 A.M. DORM CLEAN UP
9:30 A.M. TO 10:00 A.M. DORM CHECK OUT
10:00 A.M TO 10:30 A.M QUESTIONNAIRES
10:30 A.M TO 12:30 P.M DEPARTURE
REFERENCES


