NATURE TREK UNIT

Contents:

OBJECTIVES:
The student will learn:
~ How to be aware of, curious about, and appreciative of the natural environment.
~ How to explore and discover the wonders and mystery of the surroundings, using the five senses.
~ How to recognize five separate habitats (see below).
~ To be aware of personal responsibility for care of the environment.

MAJOR CONCEPTS:
~ Riparian, Coniferous Forest, Open Meadow, and Pond Habitats
~Biotic and Abiotic Factors
~ Interdependence
~ Web of Life
~ Producer and Consumer
~ Energy Levels
~ Erosion and Deposition
~ Human Impact on the Environment

MATERIALS NEEDED:
~ Crayons
~ Blindfolds
~ Web of Life Cards
~ Coil of string
~ My Place in Nature Worksheets, Pencils, Writing Boards

SUPPLEMENTAL RESOURCES AVAILABLE:
' Sharing Nature With Children, Joseph Cornell (highly recommended)
' Acclimatization, Steve Van Matre
' Sierra Nevada Natural History, Tracy I. Storer and Robert L. Usinger
' Sierra Club Naturalist's Guide: The Sierra Nevada, Stephen Whitney

NATURE TREK - INTRODUCTION

"Climb the mountains and get their good tidings,
Nature's peace will flow into you as sunshine into trees.
The winds will blow their own freshness into you and the storms their energy,
while cares will drop off as autumn leaves."

This is an invitation written by John Muir, one of this country's most famous nature lovers. Muir spent much of his life experiencing the Sierra. He loved the mountains and his dream was to share that love with others. To accomplish this, he helped found the Sierra Club in 1892, which has been introducing people to the beauty of the mountains ever since.

This unit is designed to allow the students at the Outdoor School to catch a glimpse of what John Muir meant when he said, "Nature's peace will flow into you as sunshine into trees." Unlike Outdoor Education's other units, this one does not principally seek to impart specific knowledge. Instead the emphasis is on discovery, exploration, observation, and just plain enjoyment of nature. If the students can begin to be curious about exploring their environment, it will be a lesson that will stay with them for the rest of their lives. They will be able to transfer the concepts involved in discovery of the outdoors from the Outdoor School to their home and school environment.

During the class time, as the students pour time and interest into observing the natural surroundings at Calvin Crest, they may come up with many questions. **What kind of animal track is this? What is the name of this flower? Why are those birds flying together like that?** You may or may not be able to answer the questions raised. That's okay - this unit seeks to create an atmosphere where it is good to ask questions and okay to not know the answers. We can look up the answer to a question like, "**What kind of track is that?**" only because someone spent a lot of time observing the animal that made the track, noting its habits and movements. Our emphasis is on creating curiosity, not simply storing up facts. You might want to have each student name a different plant or animal. Give him/her an opportunity to think about an appropriate descriptive name. Juan might name a purple flower a purple thurple. It becomes "Juan's Purple Thurple." This is not only fun, it helps the students personally identify with nature and heightens their powers of observation.

One excellent resource we have found on appreciating nature is Sharing Nature With Children by Joseph Cornell. A copy of it can be found in the Outdoor Education office, and an excerpt from that book is provided here for you.

HOW TO BE AN EFFECTIVE NATURE-GUIDE

(A Few Suggestions For Good Teaching) from Sharing Nature With Children - Joseph Cornell

Before we begin exploring nature with children, let's think for a moment about our role as teacher/guides. What are the basic rules for giving children - and ourselves- a joyous, rewarding good time?

I would like to share with you five tenets of outdoor teaching that have helped me work with children's lively energies - channeling them away from mischief, and toward more constructive, and ultimately satisfying, pursuits. Underlying these principles are basic attitudes of respect for children and reverence for nature - attitudes to which they will surely respond.

1. Teach less, and share more. Besides telling children the bare facts of nature ("This is a mountain hemlock tree"), I like to tell them about my inner feelings in the presence of that hemlock tree. I tell them about my awe and respect for the way a hemlock can survive in subalpine conditions - where water is scarce in summer, and mostly frozen in winter; where harsh winter winds twist and bend and kill its branches. And I tell them I always wonder how the roots of the hemlock ever manage to find enough nutrients to survive, in these solid-rock crevices. Children respond to my observations much more freely than they respond to textbook explanations. Take the case of a hemlock tree that grew near a camp where I worked. This particular hemlock sits between two huge boulders, so it has had to send its roots down twenty-five feet to reach the rocky soil below. At the time, it was at least two hundred years old, and only eight feet tall. The children would frequently make a detour on their hikes just to empty their canteens by its roots. Several of them returned to the camp year after year, watching the tree's stubborn struggle for life in its harsh environment. In fact, as soon as they arrived at camp, they would run out to see how it had fared through the dry autumn and cold winter. Their loving concern awakened in me an even deeper respect for the mountain hemlock.

I believe it is important for an adult to share his inner self with the child. Only by sharing our deeper thoughts and feelings do we communicate to, and inspire in others, a love and respect for the earth. When we share our own ideas and feelings, it encourages a child to explore, respectfully, his own feelings and perceptions. A wonderful mutual trust and friendship develops between the adult and the child.

2. Be receptive. Receptivity means listening, and being aware. It is one of the most richly rewarding attitudes you can cultivate while working with children. The outdoors brings out a spontaneous enthusiasm in the child that you can skillfully direct toward learning.

Be sensitive: every question, every comment, every joyful exclamation is an opportunity to communicate. Respond to the child's present mood and feelings. Expand your child's interests by teaching along the grain of his own curiosity. When you respect his thought, you'll find your time with him flowing easily and happily.

Be alert to what nature is doing around you at the present moment. Something exciting or interesting is almost always happening. Your lesson plan will be written for you minute by minute if you tune in with sensitive attention.

3. Focus the child's attention without delay. Set the tone of the outing right at the start. Involve everyone as much as you can, by asking questions and pointing out interesting sights and sounds. Some children are not used to watching nature closely, so find things that interest them, and lead them bit by bit into the spirit of keen observation. Let them feel that their findings are interesting to you too.

4. Look and experience first; talk later. At times, nature's spectacles will seize the child in rapt attention: a newly emerging dragonfly pumping blood into tender unfolding wings, a lone deer grazing in a forest clearing. But even if those special sights are lacking, the child can have an experience of wonder by just watching quite ordinary things with close attention. Children have a marvelous capacity for absorbing themselves in whatever they're looking at. Your child will gain a far better understanding of things outside himself by becoming one with them than he will from second-hand talk. Children seldom forget a direct experience.

Don't feel badly about not knowing names. The names of plants and animals are only superficial labels for what those things really are. Just as your own essence isn't captured by your name, or even by your physical and personality traits, there is also much more to an oak tree, for example, than a name and a list of facts about it. You can gain a deeper appreciation of an oak tree by watching how the tree's mood shifts with changes in lighting at different times of the day. Observe the tree from unusual perspectives. Feel and smell its bark and leaves. Quietly sit on or under its branches, and be aware of all the forms of life that live in or around the tree and depend on it.

Look. Ask questions. Guess. Have fun! As your children begin to develop an attunement with nature, your relationship with them will evolve from one of teacher and fellow-student to one of fellow-adventurer.

5. A sense of joy should permeate the experience, whether in the form of gaiety or calm attentiveness. Children are naturally drawn to learning if you can keep the spirit of the occasion happy and enthusiastic. Remember that your own enthusiasm is contagious, and that it is perhaps your greatest asset as a teacher.

NATURE TREK - LESSON PLAN

The Trail

The Nature Trek Trail is a relatively easy saunter around the central part of Calvin Crest. You will travel through a variety of habitats ranging from stream side to coniferous forest. The diversity of habitats allows students to experience a variety of plant and wildlife species. As previously stated, the objective of this course is to experience nature in a manner that provides opportunity for discovery and enjoyment, more so than to learn specific facts. At the same time, the enjoyment of any experience can be enhanced if the participants have some understanding of what it is they are experiencing - thus the emphasis on habitat types.

The trail leaves the Dining Hall from the patio/deck side. Follow the blue triangular markers with the symbol of the Deer on them. If the triangle points straight up, continue in the same direction you are traveling. Whenever the triangular marker points off to one side or the other, turn and follow the trail in that direction. Look for cedar posts with engraved numbers on them (**Markers #1-7**) for locations of specific activities. These numbers correspond with the numbers on the map given at the back of the unit.

Begin the trek from the patio near the student store. Pass on the left side of the playground on the trail leading down to the lake. Continue straight ahead of you instead of turning to go downhill toward the lake. Look for **Marker #1** where you will do the "Sights and Sounds" activity. From here you will continue to follow the blue triangular markers in a course that takes you across the stream to the meadow beyond the lake. "My Place in Nature" is stored in a cabinet next to the lake, but can be done anywhere along the trail. The same is true for the "Silent Walk" activity. Time needed to complete each of the activities and make observations will depend on your discretion and timing. Emphasize those aspects of the course that you deem most significant.

The Activities

The lesson plan is a guide for accomplishing the goals set forth in this unit. Since this is a unit to be experienced, more than taught, the flow and spirit of the class time will change with every teacher who leads the class and every group of students who participate. This is because so much of the personality, inquisitiveness, and excitement of the individual is infused into the class time. You might want to spend more time on some activities and forget about others. It is meant to be a flexible lesson plan, ready for the inspiration of the moment and open to following any tangent which may be discovered. Have fun, learn, and enjoy!

The first two activities, "Sights and Sounds" and "The Blind Trail," are introductory, designed to set the tone for the entire class time. "Sights and Sounds" helps the students tune in to the natural setting around them and creates a quiet, contemplative mood for "The Blind Trail." "The Blind Trail" can be a very meaningful experience and will open up a receptivity to nature in students.
The body of the lesson plan consists of walking around the grounds and visiting the varied habitats which exist at Calvin Crest. You may see evidence of animals in the forms of tracks, droppings, or

nibbled leaves on plants. Unless you are very patient and willing to wait quietly for a long time, it will probably be difficult to see the animals themselves. In the various places the students should be encouraged to investigate and explore. It is helpful for students to learn the word "habitat," but more importantly, they should be able to recognize that the places you visit are different from each other, and be able to decide what makes them different.

In addition to making observations in the different habitats, some activities are planned. The "Web of Life" game is probably best played in the meadow or the circle of benches as you walk around the lake, although it is up to you to decide when it is most appropriate. This game emphasizes the interrelationships between all living and non-living things in the environment, including humans. Content about relationships between organisms, food chains, food webs, and the energy pyramid is found with the Open Meadow habitat, though it could be taught at any time. This is meant to be a flexible lesson plan, and you can do any of the activities at any point along the trail.

One way to conclude the class time is the "Silent Walk." Students rarely get a chance to experience solitude anywhere, let alone in the woods. This activity will emphasize quiet enjoyment of the beauty of the Sierra.

Activity #1: Sights and Sounds (from Sharing Nature With Children)

In this introductory activity, students will use their senses of sight and hearing to try to detect the variety of colors that are visible, as well as to listen for the sounds of nature. They will learn to detect differences between man-made sounds and the sounds of the environment. They will learn that sounds can come from living and non-living sources. They will recognize that there are many shades of green, as well as be able to recognize the predominant colors in a landscape.

Focus Questions

1. How can we tell the difference in man-made and natural sounds?
2. What are some sounds that come from living sources?
3. What are some sounds that come from non-living sources?
4. What are the most common (predominant) colors that we can see surrounding us?
5. What might cause those colors be what they are?
6. How many different shades of green can you see?

Main Ideas

1. Humans are a natural part of the environment and also is the source of many unnatural sights and sounds. Those unnatural sounds are often distinctive.
2. Sounds in nature come from both biotic (living) and abiotic (non-living) sources.
3. The colors we see in nature are characteristic indicators of the environment we are in.
4. The colors we see in the sky above, in the ground below, and in the plants (or lack of) can tell us much about the environment if we observe carefully.
5. There are many different shades of green in plants, and the amount of green is dependent upon the amount of chlorophyll in leaves and foliage.

Objectives
By the end of the activity, students will be able to:
1. Identify at least one sound from each of the following sources: man-made, natural living (biotic), and natural non-living (abiotic).
2. Be able to describe the predominant colors of the landscape.
3. Be able to relax and enjoy using his/her senses of sight and hearing.

Materials
Crayons for optional variation.

Time Required 10-15 minutes

Location Marker #1 near the ponderosa pine and the manzanita at the trail intersection.

Terms
Biotic: living, having life. "Biology" is the study of life. All of the living organisms (plants, animals, protists) make up the biotic part of an environment.
Abiotic: non-living, not having life. "A" means not having the characteristic of, therefore "a"biotic means not having life in it. Rocks, the sky, water, and sunlight are all abiotic features.
Chlorophyll: the green, photosynthetic matter in plants responsible for producing food from sunlight, carbon dioxide, and other nutrients.

What to Do
1. Have your group of students lie down on their backs (depending on how wet the grassy area is) with both fists held up in the air. Every time someone hears a new bird song he lifts one finger. Who has the best hearing? This is a wonderful way to make children aware of the sounds (and the stillness) of nature. For fun, see if you can count to ten without hearing a bird song. Vary the game by listening for general animal sounds - or for any sounds at all, like wind in the grass, falling leaves, rushing water.
2. Introduce the terms "biotic" and "abiotic." Have students listen for examples of each. How could they tell the difference? Listen, too, for sounds that indicate the presence of people other than your group. Do those sounds seem natural or unnatural? Why? (Alternatively, have students count biotic and abiotic sounds on separate hands and compare the differences.)
3. To get children to concentrate more deeply on any natural setting, ask them how many different colors and shades of colors they can see in front of them without moving from where they are lying (sitting, or standing). Which colors are the most common? Why do students think they are so common? In what ways are the colors here similar to, or different from the colors they see at home?

Optional
After discussing colors found in nature, give each student a crayon. Ask students to find something that is the same color as the crayon they are holding as you walk around for class. (Possible variations: Find something in each habitat, find something biotic and abiotic, etc.) Note: Depending

on the season, some crayon colors will be far more difficult than others. Green crayons, for instance, will be a lot easier to match to biotic factors in winter than an orange or a pink crayon.

Activity #2: The Blind Trail

In this activity, blindfolded students will walk along a roped trail, and try to learn as much as they can about their surroundings without seeing them. They will need to depend on their other senses in order to make accurate observations.

Focus Questions

1. How can we learn about our surroundings if we cannot see them?
2. What senses proved to be most valuable in discovering features of the surrounding environment?
3. What was most challenging about being blindfolded? Why?
4. What was most rewarding about being blindfolded? Why?
5. Can this experience be helpful in helping us to understand other people who have visual impairments? How?

Main Ideas

1. We learn about our surroundings by making careful observations.
2. Our sense of sight is a valuable tool we use for learning.
3. Our other senses can be valuable for making accurate observations when used carefully.
4. Features of natural objects such as texture, hardness, shape and size can determined without visual observations.
5. An experience like this can be helpful in enabling us to understand some of the challenges faced by individuals with physical handicaps, and possibly enable us to better empathize with them.

Objectives

By the end of the activity, students will be able to:

1. Explain at least two ways they learned about their surroundings without seeing them.
2. Feel a sense of accomplishment at traversing the route successfully without seeing where they were going.
3. Realize the importance of using their other senses to gain information.
4. Gain some insight into the world view of a visually impaired person.

Materials

Blindfolds

Time Required 30-40 minutes

Location Marker #2 about 50 feet beyond the trail junction and Marker #1.

What to Do

Have your cabin leader help you blindfold all the students. The most efficient way to do this is to have the students split into two groups. One group stands behind the other. Give each student in the back line a blindfold. Show them how to fold the bandanas and tie them on the students in front of them so that the blindfolded persons cannot see anything. Once this is done and you have checked the blindfolds, have the blindfolded students sit down right where they are. Next, you and the cabin leader move behind the remaining students and blindfold them in a similar manner. Then have these students sit down as well. Try to give the students a concrete idea of how to explore the trail, so that they don't just hurry through it. The following instructions will help the students have the best possible experience on the trail:

1. Before starting the trail, have all the students sit with their blindfolds on and "observe" nature. Have them feel the warmth of the sun on their faces, or the cold of a misty rain, or whatever the weather may happen to be. Have them smell the leaves and hear the wind. They can rub some bark on their cheeks, or taste a blade of grass. This gives the students a good idea of what to do on the trail and it also sets the mood.
2. Tell the students to follow the trail by holding onto the rope with their right hands and feel what is around them with their left hand. They should stay on the left side of the rope.
3. Encourage them to go slowly, finding out as much as possible about the things they pass on the trail. Tell them you will be discussing what they found out when they're all finished.
4. Remind them to use all their senses except their sense of sight.
5. When they finish, they need to remain silent until **everyone** is done with the trail. They need to sit with the blindfolds still in place. The cabin leader will help them find a place to sit.
6. **Do not tell the students that this is a loop trail. Instead, have them figure it out as they undertake the trek.**

To enable the students to walk one at a time through the roped course, it is recommended that you have your cabin leader stay with the group to dismiss them individually while you move partway down the trail. Explain to the cabin leader that (s)he should help one student get started, then wait until that student has reached you before sending the next student down the trail. The cabin leader should guide the blindfolded students to the rope, put each student's right hand on the rope, and remind them to travel silently, and observantly.

After the last student has finished, (**everyone else should be seated near the cabin leader with their blindfolds still on)**, allow the students a chance to share their experiences on the trail with the whole class. With their blindfolds still on, have them give descriptions of what they learned. This will encourage the use of descriptive language, as well as engage the listeners' imaginations more effectively. Ask students to describe smells, textures, sounds, or other aspects of their experience.

When the discussion has been brought to a close, have students remove their blindfolds, give them to the cabin leader, and take the group on a visual walk along the route they traveled. How close were they in their descriptions of what they "saw"?

Variation: Divide students into pairs. Blindfold one student and ask the other to guide his or her partner around the loop trail using vocal cues and without touching them. The blindfolded student should keep their right hand on the rope and stay to the left of the rope throughout the activity. When a pair has finished, have them trade roles. This variation teaches students to be extra aware of their surroundings and the power of sight as they are leading a blind partner. Remind the "leaders" that their partner needs to be told when to duck or step a certain way to avoid obstacles. It can also serve as an exercise of trust as the blindfolded partner must trust the other to guide them safely. After the activity, you might discuss what is challenging about both roles.

Optional Activity: Before, After, or Instead of The Blind Trail
Divide students into pairs. Blindfold one student while the other retrieves an object from nature around them and gives it to his or her blindfolded partner. (Do not allow students to pick up scat.) Give the blindfolded partner a few minutes to study their object and then place all the objects in the middle. Remove the blindfolds and ask the students if they can locate the object they just studied. Have the partners trade roles. After the activity, discuss ways that students learned to identify their objects without their sense of sight. Did they use their other senses in the same ways when their blindfolds were removed? If a group of students is nervous about the blind walk, it may be beneficial to do this activity first to get students used to being without their sense of sight. It can be equally beneficial once students have started thinking about how to use their other senses more effectively.

TAKING A CLOSE LOOK AT HABITATS

As you walk the Nature Trek trail, visiting the different habitats, encourage the class to be aware of their surroundings. They should look closely at the soil in each area, the kinds of plant life growing there, the wildlife (including insects) and evidences of animal life. There is a variety, and abundance of animal life at Calvin Crest (e.g. mule deer, gray squirrels, pocket gophers, coyotes, raccoons, stellar jays, etc.). We seldom see many of the species here because the noise and commotion we make keeps the animals far away from where we are. They do, however, leave behind traces of their presence for those who look carefully.

The following list is a set of general questions which can be used in any of the areas to stimulate the students' natural inquisitiveness. Mix and match questions for different areas and add your own. In several different habitats, have the students pick up leaves and some soil. Have them close their eyes and examine them by touch and smell. Is the leaf small or large? Can you feel its veins? Is it soft or leathery? Are the edges rounded or toothed, sharp or smooth? Is the soil dry or moist? Does it crumble easily in their hands? Is it coarse or fine? What odors or fragrances can they detect? Have them compare /contrast their findings from different areas. Why might they be different?

Other questions that could be explored:

1. What is the soil like here compared to the last place we visited?
2. Is there water nearby? How much? How would that affect what lives here?
3. What kinds of plants grow here that didn't grow in the last place? What kinds are the same?
4. Why do you think the plant life is different here?
5. Pick a 2" square piece of ground and examine it. Do you see any evidence of life? Pick a 2' square piece of ground. Do you see any evidence of life in the larger area?
6. Look over the whole area. What evidences of animal life can you find?
7. What kinds of animals do you think could live in this place? Birds? Bear? Fish? Raccoons? Etc.?
8. If you were an ant would you want to live here? What would you eat? Where would you stay? Vary this question by suggesting other animals.

Leave "The Blind Trail" by going around the right side of the rope and continuing towards the next fork a small stream. About 50 feet beyond the end of "The Blind Trail" you will find yourself by **Marker #3.**

Activity #3: Riparian Habitat Observations

In this activity, students will walk upstream through a riparian habitat, observing plant life and evidence of animal life along the way. They will use classification skills to recognize the characteristics of a riparian (stream-side) habitat.

Focus Questions

1. What is a habitat? (The place or site type of site where a plant or animal naturally or normally lives and grows.)
2. What are the main types of plants found in this habitat?
3. What evidence is there of animals using this habitat? What kind of animals would we expect to be here? Why?
4. What is the most important abiotic (non-living) feature in this habitat?

Main Ideas

1. A riparian habitat is a very narrow strip of land alongside a stream or river, that is characterized by water loving plants and by animals dependent on the availability of the resources found there for food, shelter**,** and cover.
2. Water is the most important factor that determines the presence of a riparian habitat.
3. The plant life in a riparian habitat is different than the plants found in the surrounding areas that are farther away from surface water.

Objectives

By the end of the activity, students will be able to:

1. Recognize that a riparian habitat extends only a short distance away from surface water.
2. Explain that water is the most important factor in the existence of a riparian habitat.

3. Observe and recognize differences between the plants on, or near the streambanks, and those in the surrounding area.
4. Show the difference between native willows and the "volunteer" apple trees by pointing out the differences in the sizes, shapes, bark, and leaves of the two trees.

Time Required 10-15 minutes

Location At **Marker #3**, about 50 feet beyond the turning point of "The Blind Trail". From Marker #3, follow the short trail upstream along the banks until you reach the larger, well-used trail.

Terms
Habitat: the place or type of site where a plant or animal naturally or normally lives and grows.
Riparian: relating to or living or located on the bank of a natural watercourse such as a stream or river.
Volunteer: a term used to describe a plant growing wild, that is normally only found on sites cultivated by man.

What to Do

1. Ask students if they know what the term "habitat" means? (Refer to definition in Terms).
2. Have students imagine their classroom is a habitat (which it is when you think about it), and have them describe some of the characteristics of their class. What features in the room are characteristic of a classroom (e.g. books, papers, pencils, erasers, chalkboards, overhead projectors, student desks, etc.)
3. Explain that during the rest of this class they will be going through different types of habitats. This first one they will observe is a "riparian" habitat. Find out if anyone knows what the term riparian means. Tell them that when they get to the end of the riparian trail, they will make up their own definition of the term to describe what the habitat was like, based upon their observations.
4. Point out to students that the riparian habitat has two features they need to be very aware of: (1) It is a wet, and therefore slippery area, and they must be careful as they walk. And (2) it is a fragile habitat, and therefore they must be very careful not to damage it as they travel through it.
5. Have students walk up the trail single file, observing as they go. Remind them of the need to make careful, not careless, observations. Have them look closely at the soil, the low growing plants, the shrubs and the trees in this habitat. Have them look for evidence of animal life. (It is very important to avoid disturbing any nests sighted. The riparian habitat is an extremely critical nesting area for songbirds such as warblers and sparrows, and we must make every effort to minimize any disturbance of their nests.)
6. Have students determine what is the dominant (most abundant) kind of tree along the riparian trail. They need to reach a consensus, and all agree as to which kind it is (willow). Have them examine the tree closely to note any distinguishing characteristics such as shape, size and color of leaves and branches, and how many trunks it has.

7. Ask them to try to find the apple trees located along the trail. In what ways are they different than the willows?
8. Have them look closely for evidence of wildlife using the trees (nests, series of small round holes in horizontal rows [evidence of sapsuckers, a species of woodpecker], insect galls, etc.)
9. Is there evidence of animal use in or near the water? Describe the evidence.
10. At the end of the short section of trail, have students make up their definition for "riparian habitat" by describing its characteristics.

Leave the riparian habitat by following the markers along the main trail a short distance beyond the stream crossing to the next trail junction. Turn right, and follow this new trail downhill, past the top of the flume (the slide at the east end of the lake), and into the small forested area beyond.

Activity #4: Coniferous Forest Habitat Observations

At this site, students will observe the characteristics of a coniferous forest by examining the trees and understory lack of vegetation, and by searching for evidence of wildlife. They will learn the cause of dead branches on the lower sections of the trees, as well as the reason so few grasses or wildflowers grow in this habitat. They will be able to describe the differences observed between the conifers here and the trees growing alongside the stream in the riparian habitat.

Focus Questions

1. Why are so many of the lower branches on the trees in this habitat dead?
2. What might be the reason that so few plants are growing here besides the trees?
3. How are the trees different here than they are in the riparian habitat?
4. What would be a good name for this kind of habitat, and why?

Main Ideas

1. A forest is an area that is characterized by trees being the dominant plants.
2. In a dense forest, the upper canopy shades the lower branches and forest floor, thus cutting out sunlight, which is necessary for plant growth.
3. The lower branches of trees die when they are unable to produce food due to lack of sunlight.
4. Wildflowers and grasses need sunlight for growth. They have difficulty growing in heavily shaded areas.
5. The trees in a coniferous forest are different than trees in a riparian habitat. Most conifer species are not as dependent upon surface water as riparian species such as willows.

Objectives

By the end of the activity, students will be able to:

1. Explain why the lower branches on the trees are dead.
2. Explain why so few grasses or wildflowers are growing on the forest floor.
3. Explain why no willows, or other riparian-type vegetation is growing here.
4. Have a better understanding of the significance of sunlight in plant growth.

Time Required 10 minutes

Location At **Marker #4**, along the trail in the forested section about 50 feet beyond the flume.

Terms
Canopy: the uppermost branches of the trees in a forest**.**
Competition: demand by two or more organisms, for resources that are in short supply.
Conifer: a plant that is cone bearing, and produces its seeds in cones.

What to Do

1. When you arrive at Marker #4, have the students describe the difference between the branches on the lower sections of the trees as compared to the branches in the upper canopy. Ask, "What could cause these differences?", or "Why do you suppose so many of the lower branches have died?" (Lower branches are dying because they are heavily shaded.) If they do not receive enough sunlight, they cannot produce food [through photosynthesis], and they die. This is a natural pruning process in a dense forest. You might mention to the students that this forest has grown only since the early 1970's. When Calvin Crest was building a new dam for a larger lake, much of the hillside topsoil here was removed. For a period of 4-5 years afterwards, large amounts of pine needles, pine cones, and other forest "litter" were put on the hillside to minimize erosion. This forest is the direct result of that erosion control process.
2. Also have students observe the amount of undergrowth (plants growing in the shade of the trees) here. Is there a large variety of plants, and are there a large number of plants? Have them discuss their observations and conclusions. In the forest you can ask questions comparing our bodies with trees. What is a tree's skin? What is its mouth or circulatory system?
3. How is this area different from the last habitat we visited? Which site had more surface water? Based on your observations, which trees are more dependent upon surface water - the trees here, or the trees in the riparian habitat?
4. Where would you find the seeds from trees like these surrounding us? What do you think the term conifer means?
5. Tell students, "When we think of the word competition in sports we know that the team with the best score wins, and the team with the worst score loses." Ask "What do you suppose happens to the losers in the competition for sunlight, water, and nutrients from the soil? Can you see any winners or losers around us here?" Have the students determine who the winners and losers are in the competition for survival here.

Leave the area by continuing down the trail through the forest, following markers out to the open meadow (across a large dirt trail) and **Marker #5**.

Activity #5: Open Meadow Habitat Observations

Students will observe the characteristics of the open meadow habitat, and recognize differences between this habitat and the two previously visited. The open meadow is one possible place to discuss relationships between organisms, energy flow through ecosystems, and the web of life, found after "Pond Habitat" in this curriculum.

Focus Questions

1. How is an open meadow different from other habitats?
2. How does that difference in appearance, and in the plants found here, affect the wildlife found here?

Main Ideas

1. The open meadow lacks trees as an important part of the environment. Grasses and wildflowers are the most common vegetation.
2. The meadow area receives more sunlight at ground level than is received in tree covered habitats. The plants found here serve as food sources for the wildlife inhabiting or using this area. Thus, we might expect to find different species of animals here than in the other habitats visited so far.

What to Do

1. When you come to the meadow, and to **Marker #5**, have the students walk around for 5 - 10 minutes to make general observations. The dirt roads along the perimeter, and through the meadow are good places to look for animal tracks. What evidence is there of wildlife use in the meadow itself? In what ways does the meadow seem different from the stream side and forest habitats? Why? How might these differences affect the wildlife in these areas? Which area feels the warmest? Why might that be so? How does shade (or the lack of it) affect plants and animals? How does water (or the lack of it) affect plants and animals? Which areas would probably produce the most food for wildlife? Why? These are all questions that students could seek answers, or at least insights for, by looking for clues in the meadow.
2. After students have had a chance to explore and been given an opportunity to share any discoveries (ground squirrel or pocket gopher holes, deer or rabbit pellets, coyote or bear tracks, butterflies or blossoms, ant lions or velvet ants), bring them together to discuss the characteristics of an open meadow. See if students have answers for the questions above, or the focus questions.

Activity #6: Pond Habitat Observations

At this site, students will observe the characteristics of a pond habitat and examine the area for evidence of wildlife usage.

Focus Questions

1. What are the main characteristics that define a pond?
2. What kinds of plant and animal life would we expect to find here?

3. Is this a healthy, or unhealthy pond? How can we tell? How might it be changing?

Main Ideas

1. A pond is an artificially confined body of water, usually smaller than a lake. This pond is man- made, and thus artificially keeps water in one place.
2. A pond has an aquatic environment, meaning that many of the organisms found here live on or in the water.
3. The water in a pond is prevented from moving in the same manner as water moves in a stream.
4. Sediments from rain runoff and snow melt enter the pond, and are gradually filling it in.
5. A process called eutrophication is occurring in this pond (due to #4) which causes the pond to be rich in nutrients, but low in dissolved oxygen.

Objectives

By the end of this lesson, students will be able to:

1. Describe some of the distinctive characteristics of a pond habitat.
2. Explain how the pond is changing due to sediments and organic material being washed into it.

Time Required 10-15 minutes

Location Near the base of the flume (slide) and Marker #6 at the "Lake."

Terms

Aquatic: growing or living in or having to do with water
Artificial: not natural or normal
Eutrophication: the process by which a body of water becomes rich in nutrients, but often shallow and seasonally deficient in oxygen; usually caused by sedimentation
Sediment: materials deposited by water or wind

What to Do

Give students an opportunity to simply observe the pond and explore near the dam and flume to look for evidence of wildlife. Ask students what is the most obvious feature of this habitat. What kind of word do we use to describe this habitat? Explain to them the meanings of the words pond and aquatic. What are other observable characteristics of this kind of habitat? What kinds of animals might we expect to find in this habitat?

Ask, and then discuss, "Where does the water come from to fill this pond?" "What else might come into the pond besides water, and how would it get here?" "What kinds of things do organisms need in order to grow?" Explain the term eutrophication to the students, and the fact that although living things need nutrients to grow, they need oxygen, too. Do they think that this pond is a healthy pond (one that is doing well) or is it unhealthy (not a health hazard to us, but unhealthy for itself)?

Explain that as the pond gets more and more nutrients washed into it, it is also getting shallower, warmer, and has less oxygen available. This affects some of the organisms that live in it. Point out that it is going through a natural process of lakes and ponds and is gradually filling in with sediments. Unless we dredge the pond, it will someday become a meadow.

Travel along the trail that goes below the flume to **Marker #7**, and the circle of benches beneath the apple trees.

Activity #7: Food Chains, Food Webs, Energy Pyramids, Web of Life

In this activity, students will participate in the "Web of Life" game. The game is designed to introduce students to the concept of interdependence, as well as to help students realize that our actions have an impact on the environment.

Focus Questions

1. What kinds of relationships can organisms (or populations of organisms) have with each other?
2. How does a food web work?
3. How are energy levels similar to the shape of a pyramid?
4. In what way are the relationships in the natural world similar to a spider's web?
5. What does interdependence mean?
6. How do the actions of mankind affect the world around us?

Main Ideas

1. Every kind of organism on earth need resources to survive: food sources, water, space, etc. When these resources are threatened, diminished, or removed, it affects the growth of individual organisms and populations of organisms.
2. Some organisms have similar needs for resources: food, water, oxygen, etc. These organisms are in a competitive relationship. When resources are scarce, it could impact the populations of these organisms. Plants are an easy example of competition. Plants all need air, water, sunlight, and space to survive.
3. Other parts of an ecosystem may have a predatory relationship, where one organism eats another. An example of this would be a ground squirrel, which is eaten by a coyote. Understanding predatory relationships can help students understand the animals that you may find in a given habitat. Where you find the prey, the predator may not be far behind.
4. Ecosystems also have mutually beneficial relationships, where both organisms benefit one another in their attempts to survive.
5. A food chain is a way to describe a set of organisms that eat one another. An example of this would be: Grass → Rabbit → Coyote. Food chains can be long or short. In an ecosystem, food chains become interconnected because different organisms may have several predators and/or several sources of food. This system of interdependent food chains is a food web.
6. Plants are producers of food through photosynthesis. Herbivores (plant eaters) are primary consumers of food. Carnivores (meat eaters) are secondary consumers of food. It takes vast

numbers of plants to feed many primary consumers which are in turn consumed by few secondary consumers, which in turn are consumed by very few highest level consumers. Thus, the energy levels in the real world are similar in nature to a pyramid. Plants form the base of the pyramid. As we ascend the energy pyramid, the numbers of organisms grows smaller and smaller with each level until we reach the highest level of consumers (known as apex predators: the large predators at the top of the food chain and food pyramid, who have no natural predators) which forms the smallest part of the pyramid**.**

7. Through photosynthesis, energy is produced by plants which is used by plants and animals and returned to the system through respiration.
8. Additionally, ecosystems rely on decomposers to recycle nutrients back to the soil by eating dead bodies and waste products of other organisms.
9. All parts of the environment, both biotic and abiotic, are intricately tied together. When an organism becomes extinct, the impact of that loss affects all other segments of an environment.
10. Interdependence means that in a relationship both individuals, organisms, or populations are in need of one another. When one member in the relationship is impacted by an event, so is the other. The highest level consumers are affected by what happens at the lowest level of producers, even though we may not realize that is true. For example, if a drought has a significant impact on the amount of grass available, gophers may not have enough to eat. If this is the case, more and more gophers die due to a lack of food. Less gophers mean a short supply of food for the foxes, which may mean a reduction of the fox population.
11. The actions of man are having widespread environmental impacts throughout the world, particularly due to habitat destruction, pollution, overuse of resources, elimination of competition.

Objectives

By the end of this activity, students will be able to:

1. Explain different types of relationships between organisms.
2. Explain how the Web of Life game demonstrates the concept of interdependence.

Materials

Web of Life Cards
Rope/string

Time Required 20 - 30 minutes

Location After passing under the Flume, the trail leads to wooden benches set in a circle at Marker #7. Or, teach this content and do the Web of Life activity anywhere along the trail.

Terms

Producer: an organism that produces its own food, and may be used as a source of food by consumers.
Consumer: an organism that eats other organisms for food; not capable of producing its own food.

Decomposer: an organism that eats the dead bodies and waste products of other organisms for food and returning nutrients to the ecosystem.
Energy Level: In a food pyramid, each level represents a transfer of energy from a lower level having more organisms to a higher level having fewer organisms.
Interdependence: the need in a relationship for one another.
Web of Life: a model of interdependence that demonstrates how all of the elements of an environment are intricately tied together much as the individual strands of a spider's web.
Apex Predator: The predator at the top of a food chain with no natural predators.

What to Do
Give a Web of Life game card to each student. Instruct them to hold it up in front of them without looking at it (so that the word(s) on it are facing away from them.) (S)he must discover who or what (s)he is by asking other students questions about the card that can be answered with either a "yes" or a "no". Tell the students that, although most of the cards are animals, others will be living and non-living things in the environment. When the students have correctly figured out their identities, have all of them sit in a circle with their cards in front of them, so that all others can see their cards. The circle formed represents nature, or the environment.

Have the students decide which of the biotic cards are producers, consumers, or decomposers. Discuss the importance of each of the abiotic factors from the cards (sun, water, etc.). Introduce the concept of food chains to students, and point out an example. Using this or another example, show students the ways that food chains are connected into a single food web. Point out that all of the biotic factors represented in the circle have different relationships with one another. Show a competitive relationship (ex. chickarees and grey squirrels have the same food source), a predatory relationship (ex. red-tailed hawks hunt deer mice), and a mutually beneficial relationship (ex. Worms consume plant litter and release nutrients back to the soil for plant growth.)
Give the coil of rope to one student who will hold on to one end of it. Bring the rope to someone else in the circle that is connected to him/her in some way: something (s)he would eat, be eaten by, or relate to. The person who then has the rope will hold onto it while you connect it to someone else in the circle. You could ask individual students to make connections, or use it as an opportunity for class discussion. The coil of rope can be given to any participant more than once if necessary. Soon a web will form, indicating the interrelationships between all members of the circle.

Once everyone is involved (every person is holding onto the rope), ask them what the string looks like. Talk about how all the environment is tied together, all the things observed today during class time are connected to each other in one way or another.

Try an experiment with the class. Ask them if there is anything in the circle (on the cards) they would like to do without. They might answer something like "mosquito," or "rattlesnake." Ask the mosquito, or snake, to start gently tugging on his/her section of rope. Whoever feels the tugging also begins tugging....until everyone in the circle is tugging! Who would be affected by the absence of the mosquito? Try this with someone else. (Variation: Discuss the implications of one species

being wiped out by a human or environmental factor by having one student place their section of rope on the ground and watching what happens when you remove one part of the web.)
To coil the rope back up, have everyone carefully set the rope on the ground. Then have the last person to have had the rope given to him/her coil the rope while your cabin leader collects the cards.

1. Introduce and discuss the term interdependence based on what they just participated in by playing the Web of Life game. Discuss environmental factors that might affect the web of life (ex. predator/prey population exchange, weather patterns like drought, etc.) Also discuss possible implications of human behavior (ex. logging reduces habitat/food sources for tree-dwelling/dependent animals, excessive building diminishes open meadow habitats, etc.) Did they find it to be true that each organism or object was dependent on another organism or object? What happens in the real world when mankind does something to "break a strand in the web of life"? Ask, "Are there ways that each of us can avoid causing environmental problems?" "Are there ways that each of us can help solve, or eliminate problems?" "How?"
2. Remind students of the role they played in the Web of Life game, and have each of them determine where they would fit in an Energy Pyramid. Discuss what kinds of things should be on each level. Remind them that they consume things on the level below their position, but are consumed by things on the level above them. Which levels are the largest, which are the smallest? Why? Remind them interactions such as these are going on in every habitat in the world.

Activity #8: Wet and Wonderful: Compare and Contrast Water in a Stream, a Pond, and a Marsh

Students will be divided into three groups for a survey of the similarities and differences between the riparian, marsh and pond habitats. They will observe that all three habitats are dependent upon the presence of surface water. They will observe that each habitat has characteristics that differentiate it from the other two habitats. They will have opportunity to reach the conclusion that one habitat is not necessarily better than another, even though it may be more appealing to people.

Focus Questions

1. What are the primary differences in the three habitats?
2. What are the similarities between habitats?
3. Do the differences in characteristics make one habitat better than another? Why, or why not?

Main Ideas

1. Each habitat has its distinct elements, and these elements are largely shaped and influenced by the presence of water.
2. Careful observations enable us to detect both differences and similarities in habitats.
3. Being different does not necessarily mean "better" or "worse;" it simply means different.

Objectives
By the end of this activity, students will be able to:
1. Describe at least one difference between each of the three habitat types.
2. Describe at least one similarity shared in common by all three habitat types.
3. Understand that different does not necessarily mean better or worse.
4. Be able to see the advantages of "edge effect."

Time Required
20 - 25 minutes

Location
Marker #7, the area with benches a short distance after passing under the flume.

Terms
Edge Effect: the effect caused by the blending or meeting of different types of habitats at their boundaries. In areas where two or more types of habitat meet, plant and animal species characteristic of both habitats may be found. Areas having greater variety of both plants and animals tend to be more productive than either habitat by itself.
Marsh: an area of soft, wet land usually characterized by grasses or cattails.

What to Do
When you arrive at Marker #7, have the students sit at the benches and explain the activity. Tell them that they are going to be divided into three groups (your choice of how to do so), and each group will have 5 minutes to make observations in each of three habitats. Point out that you are on the edge of a riparian (stream side) habitat again, and that you have just been by a pond. Additionally, across the small stream feeding into the lake is a marshy area. They will work in their teams, and each team will have one reporter/habitat (3 total) who will be responsible to report their team's observations to the rest of the group. Everyone in each group needs to work as an observer.

At each site students should observe:
1. What is the water like? (still, moving, clear, murky, warm, cold, etc.)
2. What is the plant life like? (trees, shrubs, grasses, wildflowers, growing in the water, growing on the land, etc.)
3. What is the animal life like? (none evident, aquatic, land dwelling, living in trees, mammals, birds, insects, amphibians, reptiles, etc.)

Divide them into groups, have them determine who their reporters will be, and assign each group to its first site - one group near the pond, one group alongside the stream, one group on the other side of the stream by the marshy area. Give them 5 minutes to make their observations at site #1, then rotate sites. Repeat until all three groups have been to all three sites. (Variation: Have groups only go to one site each and then share their findings.)

Regroup and have the reporters report their observations. Allow for discussion based on the reports. Introduce the concept of edge effect to them, and explain how the meeting of these three habitats provides the benefits of each. Discuss, "Is one of these habitats better than the others? Why, or why not?"

Activity #9: My Place in Nature

In this activity, students will practice their skills of observation and record-keeping. Students will be given time to be still, observe, and write and/or draw the world around them and their reactions to nature.

Focus Questions

1. What do you notice about your "special place" along the trail? What do you observe using your senses? What are your thoughts or feelings about it.
2. What is important about the world around us?
3. What did you notice that you might not have noticed if you had not taken the time to be quiet and still?

Main Ideas

1. There are interesting things to observe and record everywhere around us.
2. Taking the time to be still and alone in nature may increase one's appreciation for the world around them or allow them to see/hear/touch/smell things around them that they might not have seen otherwise.

Objectives

By the end of this activity, students will be able to:

1. Show their drawn and/or written descriptions of their "special place" along the trail.
2. Understand the value of taking the time to be still in one place in nature.
3. Describe their surroundings in detail.

Materials

My Place in Nature Worksheets
Writing Boards
Pencils

Time Required

15 -20 Minutes

Location

In the open area next to the pond, or anywhere on the Nature Trek trail. (Keep in mind that we do not want to disturb off-trail sites - spread students out accordingly.)

What to Do

1. Give each student a writing board, pencil, and My Place in Nature worksheet.
2. Explain to the students that the class will spread out and take the time to be still and quiet in their own "special place" in nature. Remind the students to stay on the trail and not to disturb the off-trail sites around them.
3. Give students time to observe the environment around them and record what their observations, thoughts, or feelings are about the general landscape, a natural object around them, and/or the week at Outdoor School. Make sure students do not disrupt one another.
4. Collect writing boards, pencils, and worksheets (if you wish).

Activity #11: Silent Walk

In this activity, students will have an opportunity to experience solitude, be able to make observations without interruptions, and gain practice in having a minimum impact on the environment.

Focus Questions

1. Why might it be better to observe wildlife alone, than in a large group?
2. What are some ways that you can travel silently, and not disturb the environment?
3. How does it feel to be alone along a mountain trail?
4. What is the best part of experiencing "solitude"?

Main Ideas

1. It is not necessary to be afraid, simply because you are alone.
2. It can be a safe and satisfying experience to walk a trail alone as long as you follow guidelines and stay on the trail.
3. It is often easier to see wildlife when you are alone than when you are with a large group of people.
4. It is important for us to remember we are visitors to these habitats, and we should try to disturb them as little as possible.
5. Sometimes it is necessary to be alone to eliminate distractions caused by others. This enables explorers to be more aware of what goes on around them.

Objectives

By the end of this activity, students will be able to:

1. Experience and begin to understand the meaning of solitude.
2. Gain understanding of the value of being quiet while making observations.
3. Explain why we as visitors need to avoid disturbing the environment around us.
4. Appreciate the variety of habitats that they have experienced in this class.

Time Required

15 -20 Minutes

Location Anywhere along the trail.

Terms
Minimum impact: making a conscious effort to cause the least amount of disturbance possible to an area in which you are active. Making an attempt to leave no trace that you were ever there.
Solitude: the quality or state of being alone, or separate from others.

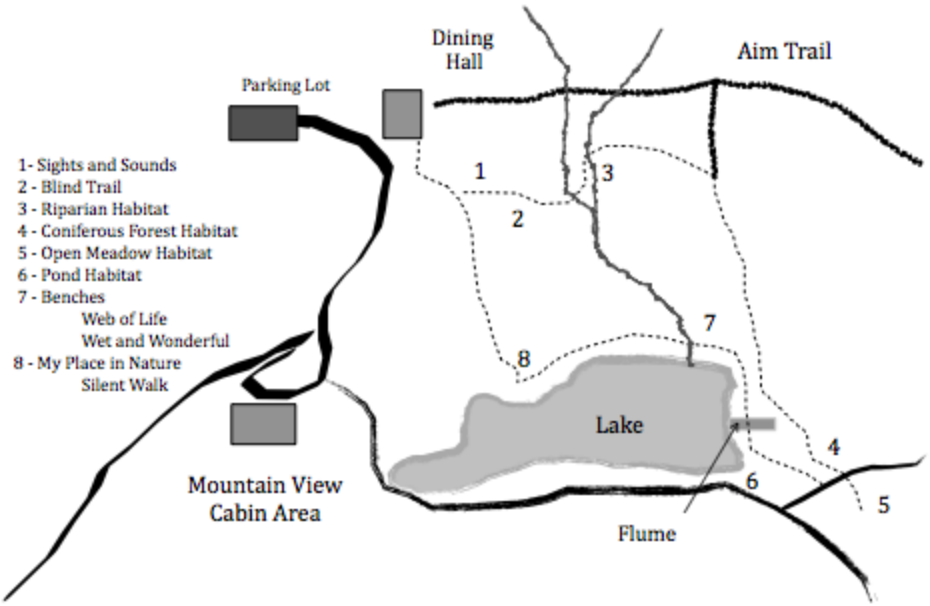
What to Do
This activity is an excellent culminating experience for the Nature Trek, though it could take place at any time. The objective of this activity is to give the students a chance to experience walking alone and silently on a trail. Instruct them to use their senses of sight, smell, touch, and hearing to enjoy and discover their surroundings. The trail back is well marked and easy to follow so students should have no trouble finding their way. Allow enough distance between each student so there will be no crowding. Everyone should be completely silent on this walk including the groups waiting at the beginning and end. This experience is a very valuable one since students rarely get a chance to be apart from a larger group out in the woods. This unit is meant to emphasize discovery, exploration, observation, and just plain enjoyment. The "Silent Walk" can tie all these together and is a fun and meaningful way to end the class time.

1. Explain that each student will hike alone. Explain that the objectives of the hike are to:
    a. Experience solitude (explain).
    b. Make observations of wildlife and the plant community.
    c. Minimize evidence of your presence so that you do not disturb others or wildlife.
2. Give guidelines for the hike:
    a. You, the teacher will hike back first. No one goes beyond you.
    b. The cabin leader will be the last person to travel back, and will dismiss students one at a time.
    c. If you see a student ahead of you on the trail, slow down or stop until that student is out of sight. Do not disturb him/her.
    d. Do not talk, and make every effort to make as little noise as possible as you hike.
    e. Do not pick up or throw sticks, cones, or rocks.
    f. Try to observe as many kinds of wildlife as possible.
    g. Enjoy your time alone. Listen for the natural sounds of the environment around you.
3. Once you have explained the purpose and guidelines, make sure that the cabin leader understands his/her responsibilities. Have the cabin leader dismiss one student/minute so that there is some space between students along the trail. The cabin leader will begin this process one minute after you have left.
4. Have everyone participate in "The Silent Walk".
5. When all students have completed the hike, discuss the experience with them. How easy was it to move silently? What were you able to observe by being quiet and alone that you might not have witnessed otherwise? What was the most rewarding part of the experience for you? Did it bother you to be alone? If so, why? How could you have improved your experience along the trail?

Nature Trek and NGSS:MS-LS2: Ecosystems: Interactions, Energy, and Dynamics

LS2.A: Interdependent Relationships in Ecosystems - Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. - In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. - Growth of organisms and population increases are limited by access to resources. - Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. **LS2.B: Cycle of Matter and Energy Transfer in Ecosystems** - Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. **LS2.C: Ecosystem Dynamics, Functioning, and Resilience** - Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. - Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. **LS4.D: Biodiversity and Humans** - Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. **ETS1.B: Developing Possible Solutions** - There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.	**LS2.A:** Nature Trek curriculum teaches about abiotic and biotic factors in ecosystems, through the examination of several different habitats found at Calvin Crest. While visiting these different habitats, students explore what they can see, hear, and experience. Teachers have the ability to introduce the ideas of competitive, predatory, and mutually beneficial relationships between organisms through the interactions students are having with nature. Relationships between organisms have cascading effects upon the rest of the environment, particularly in regards to population and survival. This concept is explored through the "Web of Life" activity. **LS2.B:** Though Nature Trek does not get into the fine details of energy transfer, the basic concepts are explored. While visiting each habitat, students are encouraged to observe and imagine what might be present there. These plants and animals all serve a producing, consuming, or decomposing function within their environment. **LS2.C:** The "Web of Life" activity is an excellent way for students to explore the idea of disruptions to an ecosystem and the effect that such disruptions may have. Though the Nature Trek curriculum does not expressly cover biodiversity as a measure of ecosystem health, students will leave from Nature Trek having learned some of the basic information that would contribute to an overall understanding of biodiversity as they continue in their education. **LS4.D:** Nature Trek Curriculum is not designed to get into specific correlation between changes in biodiversity and humans' resources. The class focuses primarily on the biodiversity itself and human impact on it. That said, it would be a natural digression in a conversation with an individual class. An individual teacher could also chose to make this a priority while teaching, if he or she chose to do so. **ETS1.B:** Solutions are difficult to develop without all of the information. It would be difficult for students to get to this stage in their learning given the time constraints of an Outdoor School class.

Nature Trek Trail Map



Appendix A: My Place in Nature Worksheet

My Place in Nature!

Draw a picture of a special place in nature. It can be anything from a landscape to a close up of something you find interesting nearby. Have fun!

Write about your place in nature. In as much detail as possible, describe your surroundings, the textures, sights, sounds, smells, colors, movements, feelings, thoughts and anything that comes to mind while you are still. This can be a poem, or even a reflection on the week.
(Use the back if you need more space to write.)

Sign_____ Date_____