Apendix 1 - Watershed Study

Refer to available packet for handouts to give to your campers. Below is an overview of what to do.

Walk around the area. Look for the following things in your watershed. Make a list of what you see in your journal .

In my site, water flows to:

low points	gutters	storm drains
ditches	culverts	lakes/streams/rivers/ponds

On it's way, it passes:

bare soil	vegetation	wells
streets	parking lots	shopping centers
industry	school	houses
litter	farms	animals

Have someone in your unit sketch a picture of your watershed.

Does anything you see look like a possible water concern?
- For example, is there bare soil; erosion with soil washing into waterways?

Can you find places where water has been carefully protected?
- *For example, is grass planted on paths to keep soil from washing away?*

Brainstorm a list of the ways you can affect water.
- What activities use water?
- What activities create waste water?
- What kinds of fun do you have with water?
- What do you already do to conserve or protect water?

Learn and discuss the following words and their meaning. These are words that directly affect/relate to water.

Conserve - Using natural resources, such as water, in a way that doesn't harm them or use them up.

Groundwater - Water found in the ground in cracks and spaces between rocks and soil particles.

Hazardous Materials - Materials that can cause harm to people or the environment.

Pollution - An undesireable change in the air, water or land that can cause harm to human health, animals or plants.

Water Quality - "Quality" means how good or bad something is.

Watershed - An area of land where all water drains, or "sheds" to the same body of water.

Appendix 2

Water Analysis

Using the charts from the nature cabin, identify the critters in the creek and determine what kind of water they can tolerate.

Summary below:

Appendix 3

Appendix 4
Animal Tracks

Appendix 5

Seven Plant Family Characteristics

i. Composite - Leaves opposite, alternate, or whorled, lacking stipules. Tiny, perfect flowers combined into a compact head. The largest family in North America represented by 2 sub-families: *Tubuliflorae* (juice not milky; all perfect disk flowers tubular, evenly 5-lobed). Included Ironweed, Boneset, Goldenrod, Coneflower, Yarrow, Thistle. *Liguliflorae* (juice milky; stem leaves mainly alternate; heads all of perfect rayflowers, rays 5-toothed at tip) Includes Dandelion and Chicory.

ii. Lily - Plants with unbranched leafy stems rising from scaled bulbs. Showy flowers are funnel-form or bell-shaped. Deciduous. Six stamens. Includes: Wild Onion, Tiger Lily, Day Lily, Adders-tongue, False Solomon's Seal, True Solomon's Seal, Lily-of-the-Valley, Trillium.

iii. Mint - Square-stemmed herbs with opposite leaves dotted by oil glands. Includes: Skullcap, Nettles

iv. Mustard - Plants with watery pungent juice; leaves alternate, simple, lobed, or pinnately divided; 4 sepals and 4 petals spread to form a cross, 6 stamens, 2 shorter than the others, 1 pistil. Includes: Garlic Mustard

v. Parsley - Herbs, often with hollow stems, compound leaves, the petioles expanded or sheathing the stem at the base; flowers usually in simple or compound umbels. Includes: Wild Celery, Sweet Cicely, Queen Ann's Lace, Wild Parsnip.

vi. Pea - Leaves simple or once-compound; usually 5 petals—theupper petal large, the wings clawed, and the 2 lower petals partly fused; 10 or fewer stamens. Includes: Clover, Shamrock.

vii. Rose - Leaves usually alternate, simple or compound, with stipules; flower parts in 4's or 5's. Few to many stamens and pistils. Includes: Goatsbeard, Bramble, Wild Strawberry.

Appendix 6
Doctrine of Signatures

By careful observation one can learn the uses of a plant from some aspect of its form or place of growing. If a portion of a plant resembled an organ or other part of the Human Anatomy, it was believed to be beneficial to that part.

Examples:

Walnuts were good for curing head ailments because “they Have the perfect Signatures of the Head.”

St. John’s Wort *(Hypericum)* - The little holes of the leaves resemble all the pores of the skin and therefore it can cure all hurts and wounds to the skin.

Spleenwort, Asplenium - thought to be useful in treating the spleen due to the spleen-shaped sori on the backs of the fronds

Liverwort - thought to be useful in treating the liver due to certain species of liverworts resembling a liver in outline.

Hepatica - has a three-lobed leaf that supposedly bears a resemblance to the liver so it was believed to be effective in treating liver ailments.

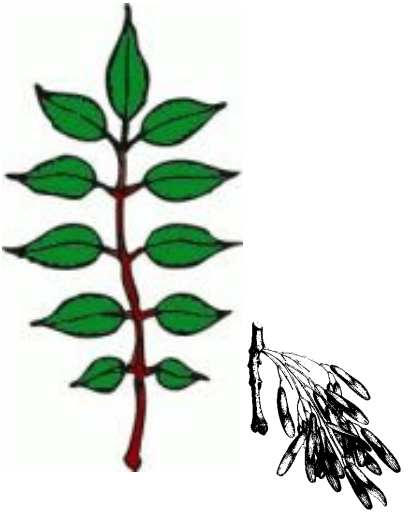
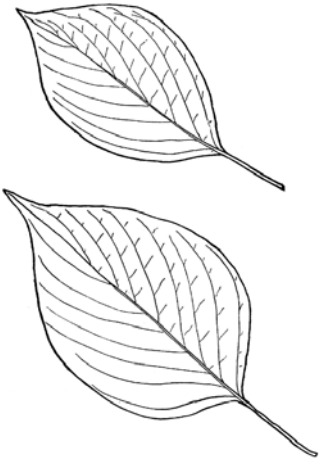
Boneset - the stem appears to be growing through the leaf. Early herbalists believed this to be a sign that boneset would be useful in setting bones.

Plants with yellow flowers or roots, such as Goldenrod were believed to cure conditions of Jaundice by the signature of colour.

Plants with a red signature were used for blood disorders.

The petals of the Iris were commonly used as a poultice for bruising because of the signature of colour, the petals resembling in hue the bruise they were to alleviate.

Appendix 7
MAD BUCK Trees

Maple Leaves 	Ash Leaves 
Dogwood Leaves 	Buckeye 

Appendix 8
Forest Layers

Forest Floor - This layer is comprised of decomposing leaves, animal droppings, and dead trees and animals. All of these decay on the forest floor and create new soil and provide nutrients for the plants. Growing out of the forest floor are ferns, grasses, mushrooms, and tree seedlings.

Understory - The understory is made up of bushes, shrubs, and young trees that have adapted to living in the shade of the canopy.

Canopy - The canopy is formed by the mass of intertwined branches, twigs, and leaves of the tall, mature trees. The crowns of the dominant trees receive most of the sunlight. This is where most of the tree's food is produced. The canopy forms a shady, protective “umbrella” over the rest of the forest.

Emergent - The emergent layer exists in the tropical rain forest and is composed of a few scattered trees that tower over the canopy.

Appendix 9

Edible Plants Recipe's

Appendix 10
Phases of the Moon

New Moon - When the Moon is roughly in the same direction as the Sun, its illuminated half is facing away from the Earth, and therefore the part that faces us is all dark: we have the new moon. When in this phase, the Moon and the Sun rise and set at about the same time.

Waxing Crescent Moon - As the Moon moves around the Earth, we get to see more and more of the illuminated half, and we say the Moon is waxing. At first we get a sliver of it, which grows as days go by. This phase is called the crescent moon.

Quarter Moon - A week after the new moon, when the Moon has completed about a quarter of its turn around the Earth, we can see half of the illuminated part; that is, a quarter of the Moon. This is the first quarter phase.

Waxing Gibbous Moon - During the next week, we keep seeing more and more of the illuminated part of the Moon, and it is now called waxing gibbous (gibbous means "humped").

Full Moon - Two weeks after the new moon, the moon is now halfway through its revolution, and now the illuminated half coincides with the one facing the Earth, so that we can see a full disk: we have a full moon. As mentioned above, at this time the Moon rises at the time the Sun sets, and it sets when the Sun rises. If the Moon happens to align exactly with the Earth and Sun, then we get a lunar eclipse.

Waning Gibbous Moon - From now on, until it becomes new again, the illuminated part of the Moon that we can see decreases, and we say it's waning. The first week after full, it is called waning gibbous.

Last Quarter Moon - Three weeks after new, we again can see half of the illuminated part. This is usually called last quarter.

Waning Crescent Moon - Finally, during the fourth week, the Moon is reduced to a thin sliver from us, sometimes called waning crescent.

Appendix 11
Moon Phases Affects on Earth

The Ocean Tides - The two primary agents when it comes to the motion of the ocean are the Sun and the Moon. The key when it comes to understanding how the tides work is to understand the relationship between the motion of our planet and its moon. Both the Moon and the Earth are constantly moving through space. Since the Earth spins on its own axis, water is kept balanced on all sides of the planet through centrifugal force. The Moon's gravitational forces are strong enough to disrupt this balance by accelerating the water towards the Moon. This causes the water to 'bulge.' The Earth's rotation causes a sympathetic bulge on the opposite side of the planet as well. The areas of the Earth where the bulging occurs experience high tide, and the others are subject to a low tide. However, the Moon's movement around the Earth means that the effects of its forces are in motion as well, and as it encircles our planet, this bulge moves with it.

The Moon's influence can also be balanced out by the position of the Sun – if the Sun and the Moon find themselves 90 degrees apart in relation to an observer on the Earth, then high tides are not as high as they normally would be. This is because despite its greater distance from the planet, the Sun's mass allows it to exert enough gravitational force on the oceans that it can negate some of the effects of the Moon's pull. This phenomenon of lower high tides is called a neap tide. In the same way, when the Sun lines up with the Moon and the Earth, as during a Full Moon, then the Sun can act to amplify the tidal forces, drawing even higher tides. These are known as spring tides, named not for the season, but for the fact that the water "springs" higher than normal. The variance in the height of the world's tides also depends on the local geography of the coastline and the topography of the ocean floor.

Tides occur regularly in the sense that they can be expected twice a day, but their periods do not coincide with the 24 hour day that we use for our calendar. This is because the Moon takes slightly longer than 24 hours to line up again exactly with the same point on the Earth - about 50 minutes more. Therefore, the timing of high tides is staggered throughout the course of a month, with each tide commencing approximately 24 hours and 50 minutes later than the one before it.

Appendix 12
Poison Ivy

Appendix 13
Make a Sundial Using Things From Nature

Sundials were used to tell the time of the day in olden times and is

based on the principle that the position of the sun changes continuously during the day. In reality, it is the Earth that rotates around the sun making it seem like the sun rises in the east and sets in the west. As the sun moves across the sky, the central post on the sundial casts a shadow on its circular plate. It is just like reading a clock the marks or calibrations on the plate tell you what time it is

The following instructions are guidelines. Materials may be different than those listed in the instructions. Be creative!

1. Find a flat, solid object in nature. You may have to put things together and lash them to make a platform. It should be 6"-10" in diameter/length.

2. Roll a small ball of the mud, stick a straight stick (about 10 inches in lengh) the “pointer” (called a gnomon) into it, then press the mud onto the center of a flat object approximately 6"-10" in diameter. The angle between the gnomon and the saucer should be the same as the latitude where you live (between 24 and 49 degrees for most states).

2. Let the mud dry with the gnomon inserted in it.

3. Set the dial outside on a level surface with the gnomon pointing north. At noon, mark where the gnomon's shadow falls on the platform's perimeter. Without moving the plate, mark off the afternoon and next morning's hours.

4. Decorate the dial/platform, then secure it in its original position. It will be accurate if you don't move it, and remember to reset it when daylight saving time is over.

Appendix 14
Weather Station/Four Main Cloud Types

High-level Clouds: The most common form of high-level clouds are thin and often wispy cirrus clouds. Typically found at heights greater than 20,000 feet (6,000 meters), cirrus clouds are composed of ice crystals that originate from the freezing of supercooled water droplets. Cirrus generally occur in fair weather and point in the direction of air movement at their elevation.

Mid-level Clouds: Altocumulus may appear as parallel bands or rounded masses. Typically a portion of an altocumulus cloud is shaded, a characteristic which makes them distinguishable from the high-level cirrocumulus. Altocumulus clouds usually form by convection in an unstable layer aloft, which may result from the gradual lifting of air in advance of a cold front. The presence of altocumulus clouds on a warm and humid summer morning is commonly followed by thunderstorms later in the day.

Low-level Clouds: Nimbostratus are dark, low-level clouds accompanied by light to moderately falling precipitation. Low clouds are primarily composed of water droplets since their bases generally lie below 6,500 feet (2,000 meters). However, when temperatures are cold enough, these clouds may also contain ice particles and snow.

Fair-weather Cumulus Clouds: Fair weather cumulus have the appearance of floating cotton and have a lifetime of 5-40 minutes. Known for their flat bases and distinct outlines, fair weather cumulus exhibit only slight vertical growth, with the cloud tops designating the limit of the rising air. Given suitable conditions, however, harmless fair weather cumulus can later develop into towering cumulonimbus clouds associated with powerful thunderstorms.

Appendix 15
Medicinal Plants

Dandelion - The fresh juice of Dandelion is applied externally to fight bacteria and help heal wounds. The plant has an antibacterial action. The latex contained in the plant sap can be used to remove corns and warts.

Black Walnut - the leaves have been used to make a soothing skin and eye wash, powder from green hulls is anti-parasitic, the bark is astringent and was chewed for toothaches. Use poultice of green hulls for ringworm. Inner bark used as a laxative.

Ginkgo - Ginkgo Tree has been historically used in alternative medicine for Heart disease, Kidney disorders, Alzheimer's, Asthma and as an energy builder. Recently western researchers have been studying ginkgo as a treatment for senility, hardening of the arteries, and as a treatment for oxygen deprivation.

Jewelweed - When you are out in the field and find you have been exposed to poison ivy, oak, or stinging nettle you can reach for the jewelweed plant and slice the stem, then rub its juicy inside on exposed parts. This will promptly ease irritation and usually prevents breakout for most people.

Wild Carrot/Queen Anne's Lace - A medicinal infusion is used in the treatment of various complaints including digestive disorders, (soothes the digestive tract), kidney and bladder diseases and in the treatment of dropsy, it supports the liver, stimulates the flow of urine and the removal of waste by the kidneys. A wonderfully cleansing medicinal herb, an infusion of the leaves has been used to counter kidney stone formation, and to diminish stones that have already formed. The seeds can be used as a settling carminative agent for the relief of flatulence and colic.

Appendix 16
Bats

Appendix 17
Take a Tree Hike
Identify trees through stories or pneumonic devices

1. Red Oaks: The "Red Man's" weapons were arrows with pointed tips like the tips of the Red Oak leaves.
2. White Oaks: The "White Man's" weapons were bullets with rounded tips like the tips of the White Oak leaves.
3. Tulip Trees: The leaves are shaped like the old style rotary telephone. This tree has been used as telephone

poles because of how straight and tall they grow. The tulip blossoms in Spring.

4. Sassafras: The leaves are shaped like mittens often with two thumbs and has a “root beer” or “orange” flavor when you chew on the stem of the leaves. Sassafras tea is made from the roots of the sassafras tree.
5. Silver Maple: Before a storm, the leaves of the Silver Maple are turned upside down showing the silver or whitish bottoms of the leaves.
6. Gingko: “The Gingko tree is really colossal, its leaf is a fan and it’s found in a fossil”.

Appendix 18
Learn Camp Wyandots and the Clear Creek Valley’s Importance as a Nature Preserve.

The Clear Creek Valley surrounding Camp Wyandot has been studied for many decades. There are many interesting facts which make Clear Creek Valley and Hocking Hills one of the most unique in the midwest. Below are a few key things to know about Glaciers, Flora & Fauna, Geology and Avifauna of the Clear Creek Valley.

Glaciers

The creek which flows east and west, along the driveway entering

camp, used to flow in the opposite direction as it does today. A major earthquake caused it to change direction and flow in the easterly direction that it flows today. Prior to Illinoian glacier, 200,000 years ago, the valley was divided by a great ridge. What is now referred to as Clear Creek flowed in a westerly direction. By the end of the glaciers, the constant flood of water cut completely through the divide draining Amanda Lake, forming Clear Creek.

Flora & Fauna

Many books have mentioned the rarity of the valley. There are ferns discovered only in the Wyandot property. Camp Wyandot had, and may still have, the only known naturally occurring colony of the northern fern "China Ostrich Fern" south of Erie. Additionally, there are at least 16 different type of ferns in and around Camp Wyandot. How many can you find?

Rhododendrons grow in and around Camp Wyandot and the Hocking Valley. They were brought down with the glacier and are ***only*** found where they glacier left them. Other than the Smokey Mountains, these beautiful flowering plants may be the last and largest "naturally occurring" Rhododendrons in the Midwest!

Geology

Black-hand Sandstone, also called conglomerate in Hocking Hills, is unique to the area. It is a combination of sandstone and small rocks *(affectionately referred to as "wishing stones" at Camp Wyandot)*. If you look closely at many of the large rock formations around Hocking Hills and Camp Wyandot, yo uwill see the sand-like quality and the small white or pinkish rocks mixed in with the sand to for these large geological formations.

Avifauna

There are over 13 species of Neotropical Migratory Birds of the Warbler family that nest in the Clear Creek Valley. Some breed only here and nowhere else in the midwest, and some nowhere else in the United States. These particular birds typically breed in Canada. The rare occurrence of "canadian" breeders nesting and breeding in the Clear Creek Valley is due, in part, to the presence of Canadian Hemlocks — the birds think they have arrived in Canada when they

reach Clear Creek's abundance of Canadian or "Eastern" Hemlocks during their Spring migration.

The importance of this area lies in it's rarity of plantlife, wildlife, attraction for nature lovers, and it's educational opportunity for people of ALL ages!

It is extremely important that we keep Wyandot and the Clear Creek valley a nature preserve.