

DAY 1

TIME

ACTIVITIES

MATERIALS

(Based on class of 30)

9:00 a.m.

Breakfast/Welcome

Estimation Game

Jar of M&M's

The Centimeter

-Metric Cube

-Centimeter Ruler

-Square Centimeters

30 scissors

30 Cubic Centimeter patterns

30 Centimeter Ruler patterns

15 rolls of clear tape

Break

Metric Guessing Game

6 Game bags

-Each bag should contain:

marble, film canister, bar of

soap, straw, penny, nickel,

plastic spoon, pack of gum,

pink eraser, pencil, nail, small

& large paper clip.

poker chips-(50)

15 metric rulers

Assorted science equipment:

beaker

graduated cylinder

soil profile tube

dropper pipette

vial

12:00 p. m.

Lunch

1:00 p. m.

Making Mass Sets

180 black film canisters with lids

Sand-10 lbs

180 adhesive labels

10 balances

10 brass mass sets

15 laboratory scoops

30 - 9oz plastic cups

300 large paper clips

15 black Sharpee pens

30 large rubber bands

Variety of items to be massed

2:00 p. m.

Water Rockets

30-2 liter plastic pop bottles-

(save caps for Activity 9-2)

construction paper-assorted colors

15 rolls of clear tape

15 color marking pens/crayons

DAY 2

***Prepare 10 Hay infusions-See next page for instructions.**

TIME

ACTIVITIES

MATERIALS

(Based on class of 30)

9:00 a. m.

Breakfast

Estimation Game

**Length of a piece of string
(in centimeters)**

**Making a Water Scoop &
Graduated Cylinder**

**30 Water Scoop patterns
6 plastic pitchers
15 rolls clear tape
30 medium paper clips
30 vials
1 roll paper towels
30 scissors
30 adhesive labels
30-9oz plastic cups
paper towels**

Metric Rainbow

**15-50 ml graduated cylinders
15-student graduated cylinders
90-25 ml test tubes
15 test tube supports
1 box food coloring-assorted colors
(McCormick's)
15 black visa vis pens
25-250ml plastic beakers
crayons
3 plastic pitchers
15 medicine droppers**

Break

Walking Water

**6-50cm lengths cotton string
6-50cm lengths of yarn
6-9oz plastic cups
6 plastic pitchers
6-3 gallon plastic tubs**

Stretching Water

**1 roll waxed paper
15 medicine droppers
15-9 oz plastic cups
1 bar of Jergens soap
paper towels**

Pepper Retreat

**15 cereal bowls
1 can pepper (fine)
1 can cinnamon
Granulated sugar
1 bottle dawn dish soap
Paper towels
6 plastic pitchers
60-1 oz plastic cups
15 medium paper clips
1 set of measuring spoons
15 plastic forks**

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u>
12:00 p. m.	Lunch	
1:00 p. m.	Hydromania Metric Olympics & Awards	3 aluminum pie pans 30 clear plastic straws 2 bags pinto beans 10 meter sticks 1 - 25 meter tape 30 cotton balls 3 large sponges 2 buckets 2 plastic pitchers 35 sheets cm graph paper 2 balances w/ mass sets 7 clip boards 20 craft sticks for markers 4 rolls masking tape (1") 30 student recording sheets station posters (7) award certificates & medals Prizes-Lifesavers candy

**Predict a Pop
(Bubble-ology)**

15 large plastic garbage bags
 15-9oz plastic cups
 30 sheets of white paper
 6 plastic pitchers
 straws, clear plastic
 15-250ml beakers
 dish washing soap
 thread and/or string
 glycerin
 6 medicine droppers

HAY INFUSION PREPARATION:

Fill jar 3/4 full of distilled water.
 Add a hand full of grass.
 Add a few grains of rice to each jar on Day 4.
 Set aside for Day 7 activity.

10 Baby food jars
 distilled water

DAY 3

*Need Ice today!
*Water samples needed!

TIME

ACTIVITIES

MATERIALS

(Based on class of 30)

9:00 a.m.

Breakfast

Estimation Game

Volume of colored water
(in milliliters)

Sinking Ice Cube
(Teacher Demo)

2-250ml plastic beakers
isopropanol
water
2 ice cubes
(optional: use colored water to
make ice cubes)

Magic Rising Ink

120 strips of chromatography
paper (2 cm x 15 cm)
15 scissors
15 rolls of scotch tape
visa vis markers-15 of each color
-brown, green, blue, black
60-16oz plastic cups (4 per group)
4 -16oz bottle of isopropanol
6 plastic pitchers
60 craft sticks-notched
15 metric rulers

Break

Conduction
(Teacher Demo)

Ball and Ring Apparatus
Votive candle
Matches
ice

Hydrometers

15 test tubes
5 rolls of 1" masking tape
3 vials of lead fishing sinkers
15-16oz plastic cups
6 plastic pitchers
2 rolls paper towels
15 metric rulers
15 sets water proof markers or pens
15 scissors

Using Hydrometers
-testing solutions

2-26oz containers of salt
1 box food coloring
30 straws-clear plastic
6 plastic pitchers
16-250ml plastic beakers
60-1oz cups
paper towels
1 gallon distilled water
Red, yellow, blue, green
permanent markers-10 of each

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u>
12:00 p.m.	Lunch	
1:00 p.m.	Burning Dollar Bill (Teacher Demo)	dollar bill isopropanol/water mixture -2:1 isopropanol/water 1-250 ml plastic beaker 1 votive candle matches tongs goggles fire extinguisher
	Guest Presentations	The Snake Man
	Water Rockets -launch	Water rockets Launcher Bicycle pump 30 index cards (numbered 1-30) Certificates Awards-3 categories-prizes

DAY 4

***Ivy geranium plant needed**

***Add a few grains of rice to the Hay infusions.**

TIME

ACTIVITIES

MATERIALS

(Based on class of 30)

9:00 a.m.

Breakfast

Estimation Game

Mass of an Object in grams

Yeast enzymes

4-16oz bottle of hydrogen peroxide
15 cereal bowls
15-9oz plastic cups
40 wood splints
matches
2 packets of dry yeast
15 votive candles

Rock Candy Crystals

2 hot plates
2 sauce pans
2 wooden spoons
30 baby food jars
30 craft sticks
string
40 medium paper clips
10 lbs of granulated sugar

Transpiration

60-9oz plastic cups
30 ivy geranium leaves
2 rolls of clear tape
30-5"x 4" index cards
1 jar of Vaseline
10 microscopes
10 slides/coverslips
5-250 ml beakers
10 medicine droppers
2 plastic pitchers

Break

Stacking Liquids

1-16oz bottle of dark Karo syrup
16oz of water
16oz of light cooking oil
15 Styrofoam trays (from lunches)
1-16oz bottle of glycerin
green food coloring
crayons
60-1oz plastic cups, calibrated
15 plastic soil profile tubes
balances w/ mass sets
2 rolls of paper towels
floating items: wax, cork, plastic
bead, rubber stopper, fishing lead
4 plastic pitchers

12:00	Lunch	
1:00	Transpiration (Part B)	Observations and Discussion Introduce Microscopes Finish Part B
2:00	Water at Work-Turbines	15-2 liter plastic bottles 15-30 cm lengths of string 15-50 cm lengths of string 30 pencils 15-9oz plastic cups 30 scissors 15 large nails optional: garden hose
	Making Electromagnets	30-2 1/2" large iron nails 30-D cell batteries 22 gauge insulated wire (150 cm length each) 30 washers 2 rolls electrician tape 30 wooden clothespins 1 wire stripper 100 medium paper clips
		OPTIONAL: masking tape-2 1/2" roll 30-3.2 volts light bulbs aluminum foil-1 roll 30 scissors

DAY 5**WARM SPRINGS FIELD TRIP**

TIME	ACTIVITIES	MATERIALS
8:00 a.m.	Depart from site	Breakfast on bus
	Points of interest -Change in elevation -Ecosystems Douglas Fir forests Ponderosa Pine forests Juniper/Sagebrush -Animal/plant species present	Pederson's Bird Guide
10:30 a.m.	Snack on bus	Snacks
10:45 a.m.	Arrive at Warm Springs Museum	(503) 553-3331
11:00 a.m.	Group A Tour Museum Group B Storyteller/Dance/Crafts	
11:45 a.m.	Group A Storyteller/Dance/Crafts Group B Tour Museum	
12:30 p.m.	Leave Warm Springs Museum	
1:00 p.m.	Arrive at Warm Springs Fish Hatchery Lunch on hatchery lawn	(503) 553-1692
1:30 p.m.	Indian games (<u>Handbook of American Indian Games</u> , Macfarlan, Allan & Paulette)	
	Lunch on hatchery lawn	Lunches
2:00 p.m.	Group A Native American talk on Salmon Group B Tour Hatchery	
2:30 p.m.	Group A Tour Hatchery Group B Native American talk on Salmon	
3:15 p.m.	Leave Warm Springs Hatchery	
4:00 p.m.	Snack on bus	Snack
6:00 p.m.	Arrive at site	

DAY 6

*Need fresh eggs-1/2 dozen

*Need fresh lemons, apples, & bananas.

*Bring in pond/scum samples for tomorrow.

TIME

ACTIVITIES

MATERIALS

(Based on class of 30)

9:00 a. m.

Breakfast

Estimation Game

Marbles in a Jar

Floating Egg (Demo)

6-9oz plastic cups
6-16oz plastic cups
6 fresh eggs
1-26oz container of salt
6 plastic spoons
6 plastic pitchers

Sink or Float

10 small bottles of white glue
100 pennies
10 corks
10 crayons
10 rubber bands
10 plastic spoons
10 film canisters w/lids
10 small pieces of sponge (2"x2")
10 twist ties
10 pencils
10 small pieces of ivory soap
10 small pieces of jergens soap
10 small balls of aluminum foil
10 large paper clips
10 plastic dish tubs
6 plastic pitchers

Water Displacement (Demo)

6-250ml beakers
6-50ml graduated cylinders
clay-5 different sized pieces

Break

Fruity Adventure-
(Why things float?)

10 small lemons
1 apple/1 banana
1 bag of peanuts w/shells
10-250ml plastic beakers
10 calculators
10 balances
Student Mass Sets (Day 1)
10-50 ml graduated cylinders
10-10 ml graduated cylinders

12:00 p. m.

Lunch

**Conserving Water-
(Saving the Hydroids)**

30 pennies
30-9oz plastic cups
30 medicine droppers
2 rolls of paper towel

Clay Boats

30 bags of clay (~50g)
10 balances
Student Mass sets
5 rolls of paper towels
10 plastic tubs
20 boxes of paper clips
30 Certificates
6 Prizes for top 2 teams

DAY 7

- *Need TV/VCR
- *Carolina Biological protozoans
- *Need pond/scum samples
- *Need celery and hay infusions.

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u> (Based on class of 30)
9:00 a.m.	Breakfast	
	Estimation Game	Distance to an Object in Meters
	Capillary Action	2 bunches of celery 2 boxes food coloring 12 - 16oz plastic cups 2 rolls of paper towels Exacto knife 3 plastic pitchers
	Preparing a Wet Mount Slide	10 microscopes 40 microscope slides/coverslips 20 medicine droppers 30 scissors 10-9oz plastic cups newspaper/thread
10:30 a. m.	Break	
	Microscope Adventure	10 microscopes 20 medicine droppers 40 microscope slides/coverslips 5 bottles of Protoslo 10 hay infusions Protozoan samples (live) Pond/aquarium scum samples
12:00 p. m.	Lunch	
12:45 p. m.	Wetlands Video-Introduction	<u>Fabulous Wetlands</u>
1:15 p.m.	Why things fly? (Bernoulli's Principle)	30 pencils 2 rolls of clear tape 30 strips of white paper (5cm x 40cm)
	Things that Fly! Stations -gliders -boomerangs -super loopers	30 boomerangs 30 clear, plastic straws 5 rolls of clear tape white paper strips 30 - 7"x2" strips 30 - 9"x2" strips stapler/staples 40 sheets of white paper

2:15 p. m.

Paper Airplane Contest

**Certificates
6 team prizes
100 sheet of white paper
30 medium paper clips**

DAY 8 RIDGEFIELD WILDLIFE REFUGE

P.O. Box 457
Ridgefield, Washington 98642
(206) 887-4106

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u> (Based on class of 30)
9:00 a. m.	Breakfast	
9:15 a. m.	Departure from Camp Site	Drinking water Water for cleaning
10:00 a. m.	Arrive at Ridgefield Wildlife Refuge	Soil testing Kits Water testing Kits 10 thermometers Bird Identification sheets Insect Identification sheets Plant Identification Sheets Water color materials
12:00 p. m.	Lunch	Insect Repellent
2:00 p. m.	Leave Ridgefield Wildlife Refuge	Film canisters for collecting: -60 black canisters -30 clear canisters 30 large plastic bags 40 rubber bands
2:45 p. m.	Arrive at Camp Site	5 large garbage bags

DAY 8

RIDGEFIELD WILDLIFE REFUGE - 6 STUDY STATIONS

1. Water testing station:

- Dissolved Oxygen test
- Carbon Dioxide test
- pH test
- Temperature, alcohol thermometers will be used to take temperature readings.
- collection of water samples to look at microscopic organisms back at the camp site. (refer to Day 7, Microscope Adventure activity)
- need to be done in groups with instructor's assistance.

2. Soil Testing Station:

- kit provides qualitative soil tests without the use of chemical reagents and test tubes. This kit uses a simple 3-step process of water, tablets, and color compactors. To test the soil, simply mix it with water and once it settles, pour the liquid off into the color comparator, add a tablet, and compare it with the color film chart for a test reading. The kit contains 40 tests for pH, Nitrogen, Phosphorus and Potash. Students will also collect some mud samples to look for microscopic organisms back at the camp site.
- need to be done in groups with instructor's assistance.

3. Habitat Art-Water Colors

Have students paint a habitat scene.

4. Native American Story:

- The Quathlahpotles of Lake River
- settlement of the Ridgefield area
- ethnobotany/plant identification/filtering plants (refer to Day 7, Capillary Action activity)

5. Nature Walk:

- Set up transpiration bags on tall grasses (refer to Day 4, Transpiration activity)
- collection of insects/identification (refer to Day 5 field trip, water striders at Warm Springs Museum.)
- identify any pollution sites
- walking tour of the surrounding area

6. Scavenger Hunt:

- have students capture a live mosquito, various insects, grasses, etc.
- students should work in groups.

THE QUATHLAHPOTLES OF LAKE RIVER

Indians of the area within and surrounding the Ridgefield National Wildlife Refuge lived along the river banks, stalking their prey in wooded uplands and gathering foodstuffs and materials for their daily needs in the lakes, streams, marshes, and open fields of the lowlands. They were a people who met most, if not all, of their needs within their immediate environment. The physical setting included a mild climate and an abundance of rivers, lakes, and ponds. The biological scene offered a year around supply of vegetation and animal life in sharp contrast to areas east of the mountains where harsh seasonal changes brought annual periods of deprivation.

Early explorers and settlers made numerous references to the presence of Indian villages all along the banks of Lake River from its confluence with the Columbia up to Vancouver Lake. Trails between Lake River and the many inland marshes and ponds were said to have been worn over a foot deep by the passing of countless natives. Recent archeological diggings have unearthed the remnants of several villages of considerable size, confirming the entries in the Lewis and Clark journals kept on their trips through this region in 1805-1806. One such village was described as being one-fourth mile in extent, consisting of fourteen large wood houses, some of which had floors sunk two or three feet. (1) It is estimated nine hundred people resided in this village referred to as a Quathlahpotle, making it only slightly less populous than the present-day town of Ridgefield upon which it bordered. On a village site south of this one was found the remains of a house measuring 300 feet in length and 25 feet in width with a slight elevation in the middle, indicating either a long passage or separate compartments. (2)

The Quathlahpotles (Cathlahpotles), as the Indians were called who resided on today's Refuge site, belonged to the Chinook Nation. Frequent trades were made with related coastal tribes as evidenced by the presence of sea otter skins and other coastal goods observed and noted by Captain Meriwether Lewis. (3) However, it is believed these people had ties with the Klickitats east of the Cascades via a route up the Lewis River, across Chelatchie Prairie, and through the low mountain passes.

On the Refuge site can still be found most of the plant and animal life upon which these river people depended. The following is a list of uses of plants and animals typical of Indians living along the rivers of the Pacific Northwest. (4)

FOOD:

- Roots or tubers of the camas lily, brake and sword ferns, cattail, horsetail rush, skunk cabbage, cow parsnip, lupine, thistle, and wapato (arrowhead).
- Greens of the horsetail rush (both giant and field), cow parsnip, salmonberry, black cap, wild celery, and thimbleberry.
- Fruits of the elderberry (red and blue), blackcaps, currant, huckleberry, Oregon Grape, rose hips, salal, salmonberry, serviceberry, wild strawberry, and thimbleberry.
- Nuts of the hazel and oak acorns.
- Smoking kninkinick was infrequent, chewing of Douglas fir pitch occurred occasionally.

-Meat of ducks, geese, grouse, heron, gulls, swans, some smaller birds (killdeer and plovers), which were inadvertently caught in nets meant for ducks, deer, elk, bear, salmon, smelt, steelhead trout, and sturgeon.

HOUSES: Made of Western Red Cedar.

HOMES AND HOUSEHOLD UTENSILS:

-Mats and baskets were woven from cattails, cedar bark and roots, hazel shoots, hemlock roots, horsetail rush roots, maidenhair fern, maple bark, reeds, rushes, sedges, limbs of the vine maple, willow bark and spruce roots.

-Cordage was made from the edges of the cattail leaf, cedar (limb, bark, fiber), hazel shoots, nettle bark, rushes and willow bark.

-Bowls, ladles and trays were carved of cedar. Mortars and bowls were also made of stone.

CLOTHING: -Women's fringed skirts were made of the inner bark fibers of the cedar or of cattails.

-Capes were made of cattails or cedar bark. More festive capes were either of cedar bark trimmed and lined with fur, or made totally of animal skins, or of duck and loon feathers.

-Shirts and leggings of deerskin were used for hunting in the brush of the woodlands.

CANOES: -Western Red Cedar.

WEAPONS AND TOOLS:

-Arrow shafts were cedar.

-Arrowheads were made from various hard stone materials as well as from the bone of elk or deer leg or wood hardened by burning.

-Bows were preferably made from cedar, although yew or vine maple were used if straight enough.

-Dip nets were made of woven nettle fiber attached to a hoop of yew.

-Adzes had wooden handles with stone blades.

-Wedges and chisels were fashioned of wood, horn, or stone.

-Hammers were stone.

OTHERS: -Feathers were secured from the red-tailed hawk, flickers or woodpeckers, and robins.

-Birds hunted only for magic were the hummingbird, Vaux's Swift, and the Western Belted Kingfisher.

Inevitably the question arises, "What became of these people?" They were to disappear within a century after the coming of the settlers. Thirty years prior to the Lewis and Clark expedition an epidemic had taken its toll on the native population. In the explorers' journals it was noted that they were shown an Indian girl of about the age whose face bore the disfigurement common to smallpox. (5) Later, in the five years between 1830-1835, the Indian villages along the lower Columbia were nearly decimated with another ideas. Hudson Bay Company personnel at Fort Vancouver suffered similarly, but due to proper medical attention few, if any, died. Quinine was reported effective in combating the disease. Because the symptoms of such diseases as measles, smallpox, or cholera were known to the fur traders and they did not mention these as being to blame for the epidemic, it is believed the scourge was most likely malaria. Fearing a spread of the pestilence, Dr. John McLoughlin, chief factor of the British fur company, ordered the nearly empty Indian villages on Sauvies Island burned. Besides lacking any immunity to the disease, the Indian remedy of sweat baths follow by a plunge in ice-cold waters served only to speed up this demise.

Those few Indians who did manage to survive along Lake River were to suffer the further assault of two devastating floods, in 1875 and 1876. Having lost all their cedar lodges in the latter flood, the Indians around Ridgefield reportedly moved to the west side of Lake River (Bachelor Island) where they erected teepees. (6) Other are said to have moved onto the Lancaster Land at the mouth of the Lewis River. Some resided in houseboats in this area. At the turn of the century a few would come into town hoping to exchange salmon for the cherries growing in the A. R. Cook orchards which were located on the east side of Ridgefield's Main Street. (7)

References:

1. Elliot Coues, editor, History of the Expedition Under the Command of Lewis and Clark II, p. 696, and III, p. 914. The entry of the first sighting was dated November 5, 1805. On the return trip, the village was visited on March 29, 1806.
2. Emory Strong, Stone Age on the Columbia, p. 32. A map on Page 26 located the various sites of known Indian villages along Lake River.
3. Coues, op. cit., III, p. 914.
4. Ruth Underhill, Indians of the Pacific Northwest. This listing was compiled from various lists and narratives scattered throughout the book.
5. Coues, op. cit., III, p. 927.
6. Related to Roy Jones as told to him by Roland Hewett who was born in Ridgefield prior to 1900.
7. Mrs. Roland Hewett recalled Old Jake and his squaw coming to town for this purpose when she first come to the area in the early 1900's.

Adapted from the Environmental Study Materials prepared for the Ridgefield Wildlife Refuge by the Association for Outdoor Education, Washington Section, Carol Warner, William H. Green, Tedi Brong, Sheila Sevier, and Donald D. Cannard.

SETTLEMENT AND DEVELOPMENT OF THE RIDGEFIELD AREA

James Carty, inspired by his friend Horace Greeley's entreaty "Go West, young man...", did this in a rather indirect way to become the first permanent settler of the Ridgefield area. Born on St. Patrick's Day 1808 in County Wexford, Ireland, he left his native land for New York in 1833. Although a copper by trade, Carty shipped out on a whaler bound for the Arctic via Cape Horn. Having contracted scurvy, Carty left the ship in the Sandwich Islands. After a full recovery he boarded a fur trader bound for the Hudson Bay post at Vancouver where he worked from 1837-1839 or 1840. Recognizing the future of the fur trade did not look promising in this area, he laid claim to land and built a log cabin at the river crossing near the site of the Indian Village of Gauthlahpotle in either 1839 or 1840. He continued his friendship with Greeley, the New York Tribune editor. It is said for years that he sent his papers which Carty used to line his cabin walls. A nephew, also born in Wexford County, and bearing the same first and surname followed his uncle twenty years later. It was the latter arrival's son, William E. Carty, a Woodland, Washington, lawyer and one time 48th Legislative District representative, who lived on part of the land now encompassed in the Ridgefield National Wildlife Refuge; thus the frequent reference to the Carty-unit on the Refuge.

Carty's first neighbors were ten years in arriving. Three unmarried men, who spent more time in the sawmills of St. Helens than in developing their land, laid claims in 1847 to the land on an island which is now appropriately called "Bachelor Island". Their names were Stillman Hendricks, B.O. Teel, and George Thing.

The Donation Land Law of 1850 brought the first influx of settlers to the area. In order to obtain exact locations of land claims, the Land Office contracted in 1851 for the establishment of the Willamette Meridian to be achieved by celestial observation, and section lines were surveyed in Clark County in 1854. The Willamette Meridian runs north and south through the present school grounds in Ridgefield. Among the Donation Land Claims filed during the 1850's were the following:

- 1849 Columbia Lancaster, Benjamin Teel, George Thing
- 1851 James Carty, William Gee
- 1852 F.A. Fowler, Arthur Quigly
- 1853 Frederick Shobert, Stillman Hendricks

The next two decades saw the area well settled and developing ties with surrounding towns. Early settlers engaged in agricultural pursuits to the extent that steamers loaded with fresh produce and dairy products plied the waters from Shobert's Landing on Lake River across the Columbia, and up the Willamette River to Portland. The trip took about three hours. Shobert's Landing was the recognized name of the community until the 1860's when a second influx, comprised mainly of Civil War veterans, brought about a change to Union Ridge. A trip overland with a team of horses and wagon meant crossing corduroy roads in all the low places where logs were laid in order to traverse the streams which coursed from the uplands down to the Columbia River bottom lands.

Present on the Carty-Unit of the Refuge are a number of quarry sites and a road leading down to Lake River where the quarried rocks were loaded onto boats bound for Portland and its muddy quagmire of streets. These stones were of basalt and before laying were formed into blocks measuring 4 x 10 x 15 inches. So precise was their measurement that the streets had an almost homogenous appearance. However, they were hazardous in wet weather; and the blocks soon began to chip at the corners, due to their rather porous structure. Needless to say, their use was rather short-lived.

Union Ridge continued to grow and to gain many of the outer signs of advancing civilization and technology as evidenced by the following summarization of development: establishment of a post office (1865), the Shobert and Thompson Store (1882), a creamery (1896), gristmill, furniture factory, and blacksmith shop (1897), completion of a bicycle path from Ridgefield to Fruit Valley (1899), a newspaper (1910), a shingle mill (1911), and the arrival of electricity (1916). The name Ridgefield came into being in 1890 and the town was incorporated in 1909.

Driving through Ridgefield today one is reminded of the past by homes left standing which were built in the last century. Especially noticeable is the giant redwood growing the front lawn of the house built by Lindley Meeker. The tree was supposedly planted at about the same time as the house was constructed -- in 1874. However, there are signs also of a community looking to the future with its wood treating plant, fruit processing company, and new boat manufacturing industry.

SOURCES OF EXTENDED STUDY:

INDIANS

1. Haskin, Leslie L., Wildflowers of the Pacific Coast, Portland: Binford & Mort, 1967.
2. "Ridgefield: Indians of the Lake River Area," Clark County History, vol. 1, 1960.
3. Strong, Emory, Stone Age of the Columbia River, Portland: Binford & Mort, 1960.
4. Underhill, Ruth, Indians of the Pacific Northwest, Washington, D.C.: U.S. Dept. of the Interior, Bureau of Indian Affairs, 1945.

SETTLEMENT AND RECENT DEVELOPMENT:

1. History of Clark County, Portland, Oregon: Washington Publishing Company, 1885.
2. History of the Expedition Under the Command of Lewis and Clark, vol II and vol III, Edited by Elliot Coues. New York: Dover Publications, 1965.
3. History of Portland, Oregon, Edited by H.W. Scott - Syracuse, New York: D. Mason and Company Publishers, 1890. pp. 205-206.
4. "Pioneers Came Early to Ridgefield Area," "The Shoberts," "Union Ridge and Ridgefield," "Railroads," and "In the Early 1900's." Clark County History, vol. 1, 1960. Edited by Roy Jones, Fort Vancouver Historical Society, pp. 62-72.
5. Swick, Frank and Carrie, "Ridgefield Today," Clark County History, vol, 1960. Fort Vancouver Historical Society, pp. 72-73.

Adapted from the Environmental Study Materials prepared for the Ridgefield Wildlife Refuge by the Association for Outdoor Education, Washington Section, Carol Warner, William H. Green, Tedi Brong, Sheila Sevier, and Donald D. Cannard.

DAY 9

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u> (Based on class of 30)
9:00 a.m.	Breakfast	
	Estimation Game	Mass and Volume of colored water
	Ecosystem Art	Construction Paper-assorted colors 5 rolls of clear tape tissue paper-assorted colors 15 bottles of white glue crayons/color pencils scissors
	Making Terrariums (water cycle)	70-9oz plastic cups 1 bag Potting soil Sand 60 bean seeds 30 (flat) of tiny plants 30 pop bottle caps 5 rolls of clear tape
	Break	
	Soda Pop Germinators	30 2-liter plastic pop bottles 4 rolls of paper towel 120 bean seeds
12:00 p. m.	Lunch	
1:00 p. m.	Hydromania Raft Regatta (teams of five)	24 - 3/8" wooden dowels 24 - gallon milk jugs w/lids milk cartons from lunches duct tape - 2 1/2" string
	Microscope Adventure (Continued)	10 microscopes 40 microscope slides/coverslips 5 bottles of Protoslo 20 medicine droppers Water/mud samples from field trip 10 hay infusions Protozoans cultures Freshwater ID Keys

DAY 10**WESTMORELAND PARK FIELD TRIP**

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u> (Based on class of 30)
9:00 a. m.	Breakfast	
9:15 a. m.	Departure	
10:00 a. m.	Boat construction/races	Large Zip lock Bag should contain: 2 sheet of white paper 1 milk carton 4 clear, plastic straws 5 paper clips small ball of clay 5 rolls of clear tape string scissors
	Boat Races	plastic container for lottery stop watches Certificates Prizes 5 Meter Sticks
	Kites	30 - 3/16" dowel 30 rolls of kite string 5 rolls of electrician tape scissors 30 popsicle/craft sticks Exacto knife Kite pattern-1 box large garbage bags
12:00 p. m.	Lunch	
	T-shirt Contest	T-shirts white Paper pencils
	Super Optic Wonders (Compass)	30 Super Optic Wonders
	Scavenger Hunt	20 large garbage bags white paper with list pencils
	Hydromania Raft Regatta	Team rafts life jackets paddle
	Awards	Certificates Boat races Raft races T-shirt contest Scavenger Hunt Prizes

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Hydromania II Summer Science Camp

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Glossary

DAY 1**OUTLINE**

TIME	ACTIVITIES	MATERIALS (Based on class of 40)
9:00 a.m.	Breakfast/Welcome/Nametags	40 Salmon Name Tags
9:30	Salmon Survey (Pre-Test)	40 surveys 40 No. 2 Hydromania pencils
9:45	Estimation Game	Pinto Beans (5,000 = ~4 lbs) 8 small plastic beads Plastic storage container (1 gallon) Salmon eggs, preserved
10:00	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon Group Names	Mural-Center piece & Section 1 40 Story books (one per student) crayons/color markers
10:15	(1-1) Constructive Communication (Communication Skills)	20 bags of Pattern Blocks (12 pieces per bag) 10 letter-size file folders with colored shapes
11:00	Break	
11:15	(1-2) Sweet Observations (Scientific Method) Workbooks	40 bags of Skittles® candy 40 student workbooks crayons/color markers
12:00	Lunch	
1:00	Salmon Play	Bonneville Power Administration Staff
1:15	(1-3) Pacific Salmon Life Cycle Hexaflexagon (Life Cycle)	40 Pacific Salmon Life Cycle Hexaflexagons 40 student scissors 40 metric rulers 20 rolls of clear tape
2:30	(1-4) Kingfishers, Smolt, and Caddisfly Larvae (Food Web)	stopwatch whistle two 40 foot ropes
3:00 p.m.	Camp ends for students.	

TIME**ACTIVITIES****MATERIALS**

(Based on class of 40)

9:00 a.m.

Breakfast/Estimation Game

Pinto Beans (5,000 = ~ 4 lb.)
 8 small plastic beads
 Plastic storage container (1 gallon)

9:15

Journey of the *Oncorhynchus*:
 A Story of the Pacific Northwest Salmon

Mural-add Section 2

9:30

(2-1) Cabbage Chemistry
 (Indicator Solution)

10 Balances/50 gram masses
 2 red cabbages (shredded)
 1 gallon tap water
 2-5 quart sauce pan (non-aluminum)
 2 hot plates
 40-250 mL plastic beakers
 20-50 mL graduated cylinder
 hand grater
 6 plastic pitchers (1 liter)
 2 wooden spoons
 1 plastic colander
 20 thermometers
 20-9 oz plastic cups

10:00

Demo: Where's the Oxygen?
 (Dissolved Oxygen)

1 hot plate
 beaker tongs
 2-600 mL glass beakers
 food coloring-assorted colors
 20 thermometers
 20-250 mL plastic beakers
 2 gallons of water

10:30

Break

10:45

Demo: Acids and Bases
 (Acids and Bases)

3-9 oz plastic cups
 200 mL of white vinegar
 200 mL of ammonia solution
 200 mL thymol blue indicator solution
 red and blue litmus paper
 medicine dropper
 100 mL of tap water

11:00

(2-2) Acid, Base, or Neutral?
 (Acids and Bases)

40 medicine droppers
 cabbage indicator solution
 20-9 oz plastic cups
 20 white plastic ice trays
 20 sheets of white paper

		<ul style="list-style-type: none"> 24 oz of Crystal Pepsi® 24 oz of lemon juice 12 oz of white vinegar 1 can of cream of tartar 1 box of baking soda 24 oz of tap water 40 grams of Ivory Snow® 24 oz of milk red and blue litmus paper 12 oz of clear dish washing detergent 26-250 mL plastic beakers 20 aspirin tablets 30 grams of Borax 100 mL of Milk of Magnesia 20-10 mL graduated cylinders 24 oz of isopropyl alcohol 40 safety goggles
12:00	Lunch	
1:00	(2-3) pH: A Color Scale (Acids and Bases)	<ul style="list-style-type: none"> 10 pH paper and color chart rolls 40 medicine droppers 20-9 oz plastic cups 20 white plastic ice trays 20 sheets of white paper 24 oz of Coke 24 oz of lemon juice 12 oz of white vinegar 1 can of cream of tartar 1 box of baking soda 24 oz of tap water 40 grams of Ivory Snow® 24 oz of milk 12 oz of clear dish washing detergent 26-250 mL plastic beakers 20 aspirin tablets 30 grams of Borax 100 mL of Milk of Magnesia 20-10 mL graduated cylinders 24 oz of isopropyl alcohol 40 safety goggles
1:45	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon Snack	Mural-add Section 3
2:00 p.m.	(2-4) Predator Prey Tubes (Predator/Prey Relationships)	<ul style="list-style-type: none"> 40 tornado tubes 80-1 liter, clear plastic pop bottles 2 packets of green confetti 2 packets of fish confetti 40 fish predator patterns 1 bottle of blue food coloring Clear tape Scissors
2:45 p.m.	Reflections	
3:00 p.m.	Camp ends for students	

Day 3

OUTLINE

TIME

ACTIVITIES

MATERIALS

(Based on class of 40)

8:30 a.m.

Leave Camp site

Breakfast

9:30

Arrive at Oxbow Park
Meet at Park Office
Group Picnic Areas A & B are Reserved
Introduction to Oxbow Park

Student Workbooks
40 adhesive name tags
First Aid Kit
Insect Repellent
Suntan lotion

ACTIVITY STATIONS:

1. **STREAM DETECTIVES (~60 minutes)**
Salmon Life Cycle, Temperature,
pH, Dissolved Oxygen (DO),
Streamwalk Game

16 thermometers
DO meter
5 pH paper rolls/charts
10 Streamwalk Games
10-9 oz plastic cups
16 clip boards
red and blue litmus paper

2. **WILDLIFE WATCHING (~60 minutes)
AND TRACKING**

Provided by Oxbow Park
Naturalist

3. **OLD GROWTH FOREST (~60 minutes)**

Provided by Oxbow Park
Naturalist

4. **ECOSYSTEM ART (~30 minutes)**
Insect Collection

16 watercolors sets
16 paint brushes
45 sheets of white paper
(8½" x 11")
16-9 oz plastic cups
2 gallons of water
40 bug boxes

5. **SALMON GAME (optional)**

2 ropes (each ~25 feet)
500 feet of string
2 cardboard boxes
4 traffic cones
50 white (3"x5") index cards
50 colored (3"x5") index cards

9:45 - 10:25

Session A

10:30 - 11:10

Session B

11:15 - 11:45

Lunch

11:50 - 12:20

Session C

12:25 - 1:05

Session D

1:10 - 1:50

Session E

2:00

Leave Oxbow Park

3:00 p.m.

Arrive back at Camp Site

Day 4**OUTLINE**

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u> (Based on class of 40)
9:00 a.m.	Breakfast/Estimation Game	Cross section piece of wood
9:15	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon	Mural-add Section 4
9:30	(4-1) A Slice of Time (Tree Rings/History) Part A-Family Tree crayons 50 sheets of construction paper 40 metric rulers 40 glue sticks	20 small tree cross section pieces 1 large tree cross section piece 50 sheets of white paper
	Part B-History of the Columbia River Salmon	box of push pins 50 labels (1" x 2" cardstock)
10:30	Break	
10:45	(4-2) Fish Bracelets (Native American Bead Work) 40 snaps (size 1 or size 2/0) thread (00) 1 bag of porcupine quills 10 scissors	40 needles (size 13) beads-(white, light blue, red, black)
12:00	Lunch	
1:00	(4-3) To Cut or Not To Cut? (Forest Management)	Video: <u>The Lorax</u> (25 minutes) TV/VCR
2:00	(4-4) Connections (Food Webs) 3 scissors hole punch	3 sets of organism cards 3 large balls of yarn
2:45 p.m.	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon	Mural-add Section 5
3:00 p.m.	Camp ends for students	

Day 5**OUTLINE****TIME****ACTIVITIES****MATERIALS**

(Based on class of 40)

8:00 a.m.

Leave Camp Site

Breakfast
Student workbooks
40 adhesive name tags
First Aid Kit
Suntan lotion

10:00

Arrive at Ft. Stevens State Park
(Gates to the park open at 10 am.)

\$3 per vehicle

(10:00-10:15)	Group A - Tour of Museum and War Games Building Group B - Film: The Firing of the Gun (8 min)
---------------	--

(10:15-10:30)	Group A - Film: The Firing of the Gun (8 min) Group B - Tour of Museum and War Games Building
---------------	--

(10:30-11:00)	Group A - Tour of the Outside Batteries Group B - Tour of Underground Battery
---------------	--

(11:00-11:30)	Group A - Tour of Underground Battery Group B - Tour of the Outside Batteries
---------------	--

11:30

Lunch
(Picnic tables available outside the Museum area.)

12:30

Sand Castle Contest
by Peter Iredale Ship wreck6 buckets
40-9 oz plastic cups
40-16 oz plastic cups

1:30

Salmon game

4 traffic cones
2 ropes (25 feet long)
2 cardboard boxes
50 white (3"x5") index cards
50 colored (3"x5") index cards

2:15

Beach Clean-up

100 pairs of latex gloves
30 large SOLV* plastic trash bags
10 gallon size plastic bags

3:00

Leave Ft. Stevens State Park

5:00 p.m.

Arrive back at Camp Site.

*Stop Oregon Litter and Vandalism

Day 6**OUTLINE****TIME****ACTIVITIES****MATERIALS**

(Based on class of 40)

9:00 a.m.	Breakfast/Estimation Game	
9:15	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon	Mural-add Section 6
9:30	Demo: The Pressure Zone (Plate Tectonics)	1 hot plate 2 bottles diet root beer 2-600 mL glass beakers pumice rock samples
10:00	(6-1) Volcanic Activity (Volcanoes)	40 volcano patterns 40-8 oz paper cups 40-4 oz plastic cups 40-1 oz plastic cups 5 pounds of modeling clay 40-9 inch plastic plates w/lip 22 oz clear dish washing detergent 1 bottle red food coloring 5 pounds of dry ice 1 hammer 1 pair of leather gloves
10:30	15 Minute Break	Prizes/Bug Boxes
11:30	(6-2) SALMO Bingo (Vocabulary Review)	SALMO Bingo Cards-extras 500 Poker Chips
12:00	Lunch	
1:00	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon	Mural-add Section 7
1:15	(6-3) The Surface Water Video (Water Pollution)	Surface Water Video (9 minutes) VCR/TV Snacks
1:30	(6-4) Storm Drain Stenciling (Community Awareness)	6 traffic cones 100 door hangers 12 stencils 6 cans of spray paint 12 safety vests 40 pairs of latex gloves
2:45 p.m.	Field Trip Information	Handouts
3:00 p.m.	End of Camp for Students	

Day 7

OUTLINE

TIME

ACTIVITIES

MATERIALS

(Based on class of 40)

7:45 a.m.

Leave Camp Site
(**Very important** to leave on time to view Mount St. Helens video at 9:05 am.)

Student maps

8:50

Mount St. Helens Interpretive Center
Castle Rock-Exit 49 (I-5) ~5 miles east

Student workbooks
40 adhesive name tags
40 No. 2 pencils

9:05

Mount St. Helens video (22 min.)
(Weather permitting, Mount St. Helens can be seen 30 miles east across Silver Lake.)

10:00

Leave Mount St. Helens Interpretive Center

10:30

Arrive at Toutle Salmon Hatchery
Collection of ash/Hatchery salmon process
Devastation to Hatchery by 1980 eruption

40 film canisters
2-1 gallon size plastic bags
40 adhesive labels

11:30

Leave Toutle Salmon Hatchery

12:45

Lunch at Merwin Dam and Picnic Area
Woodland Exit 21 (I-5)

1:30

Leave Merwin Dam and Picnic Area
(State route 503 towards Cougar (go through Cougar)
Service road 90 then Road 83.)

2:15

Arrive at Ape Cave

Short Presentation by Forest Service Personnel
(Students will need warm clothing and shoes for the hike.)

15 lanterns (RESERVED
at Ape Cave)
15 flashlights
candles/matches

3:45

Leave Ape Cave

5:00 p.m.

Arrive back at Camp Site

Day 8

OUTLINE

TIME

ACTIVITIES

MATERIALS

(Based on class of 40)

9:00 a.m.

Breakfast/Estimation Game

1 Bigmouth Minnow

9:15

Reflections
Journey of the *Oncorhynchus*:
A Story of the Pacific Northwest Salmon

Mural-add Section 8

9:30

(8-1) Fish Prints
(External Structure)

12 Bigmouth Minnows
100 sheets of newsprint
1 bottle of black tempera paint
Newspapers
1 pound of modeling clay
20-9 oz plastic cups
10 rolls of paper towels
1 box small straight pins
6 plastic tubs
1 bottle of dish washing detergent
20 medium paint brushes
2 bottles of lemon juice
1 box of baking soda
40 glue sticks
Assorted colors of construction
paper (12" x 18")

10:30

Break

(Rinse the paint off the fish.)

10:45

(8-2) Fish Dissection
(Internal Structure)

15 microscopes
microscope slides/coverslips
8 dissection pans
40 dissecting probes
8 scalpels
8 dissecting scissors
8 rolls of paper towel
12 Bigmouth Minnows
6 plastic tubs
2 bottles of lemon juice
1 box of baking soda

12:00

Lunch

Day 9**OUTLINE**

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u> (Based on class of 40)
9:00 a.m.	Breakfast/Estimation Game	
9:15	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon	Mural-add Section 9
9:30	(9-1) Dancing Rice (Static Electricity)	1 medium bag of Puffed Rice 40 large balloons 1 roll of kite string 20-9 inch paper plates 1 container of iodized salt 1 large container of black pepper (fine ground) 12 pieces of wool cloth
10:00	(9-2) Magnetic Fields (Magnets)	40 dowels (~20 cm in length) 115 ring magnets (~2.5 cm dia.) 20 bar magnets 4 boxes medium paper clips
10:30	Break	
10:45	(9-3) Electricity & You (Electricity)	40 Pathway Sheets 40 miniature light bulbs 40 miniature sockets 36 m insulated wire (22 gauge) sandpaper wire cutters 2 rolls clear tape 40 house patterns 2.5 lb. modeling clay 80 notched craft sticks 80 craft sticks 40 "D" cell batteries 6 hole punches 200 medium rubber bands 1 box medium paper clips 2 rolls of electrical tape
12:00	Lunch	Autograph signing
1:00	Journey of the <i>Oncorhynchus</i> : A Story of the Pacific Northwest Salmon	Mural-add Section 10

Day 10

OUTLINE

<u>TIME</u>	<u>ACTIVITIES</u>	<u>MATERIALS</u> (Based on class of 40)
9:00 a.m.	Leave Camp Site	Breakfast Student Workbooks 40 adhesive name tags First Aid Kit
9:45	Arrive at Washington Park Zoo	
10:00	Scavenger Hunt-Endangered Species Tour of the Exhibits/Train ride	
12:00	Lunch Bird of Prey Demonstration	
1:00	Scavenger Hunt-Endangered Species Tour of the Exhibits/Train ride	
1:45	End of Scavenger Hunt (Meet at grassy area between the Elephants and AfriCafe.)	Prizes
2:15	Leave the Zoo	
3:00 p.m.	Arrive back at Camp Site	

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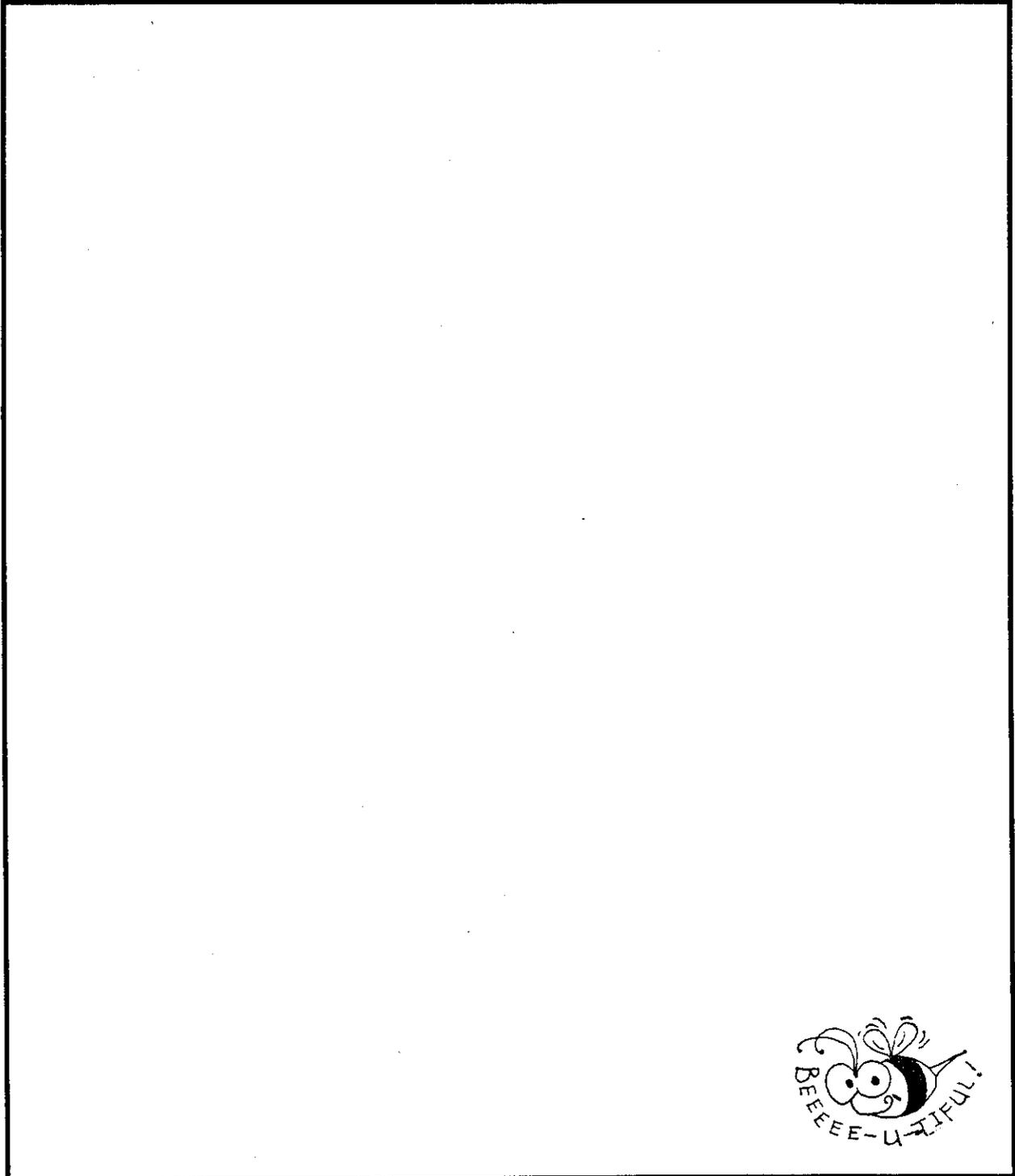
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Hydromania III Journal

Name _____

Day _____

Please describe in writing or by drawing pictures what you learned in camp in the past day.



Day 5

Teacher's Guide

- 9:00 a.m.** **Depart Camp for Bonneville Dam Tour on Washington Side
(breakfast on bus)**
- 10:00 a.m.** **Arrive Bonneville Dam Washington Side**
- 10:15 a.m.** **Check-in For Corps of Engineers Tour**
- 10:30 a.m.** **Tour Dam**
- 11:45 a.m.** **Lunch**
- 12:30 p.m.** **Depart Bonneville Dam for Hood River crossing**
- 1:15 p.m.** **Arrive ODFW Fish Hatchery at Bonneville**
- 1:20 p.m.** **Self-guided Tour of Fish Hatchery and Facilities**
- 1:45 p.m.** **Depart for Multnomah Falls**
- 2:00 p.m.** **Arrive Multnomah Falls**
- 2:15 p.m.** **Take Nature Hike up Falls Trail**
- 3:15 p.m.** **Board Buses to return to camp**
- Snack Break On Bus**
- 4:00 p.m.** **Camp Ends for Students**

Day 7

Teacher's Guide

- 9:00 a.m.** Board buses and depart camp for Mt. Tabor/Metro Central Station
- 9:05 a.m.** Breakfast on Bus
- 9:30 a.m.** Arrive Mt. Tabor Reservoir/Metro Central Station for tours
- 10:30 a.m.** Switch tour sites / Snack on Bus
- 11:45 a.m.** Depart tour sites for lunch at Washington Park
- 12:00 p.m.** Lunch
- 12:45 p.m.** Depart for Western Forestry Center
- 1:00 p.m.** Arrive forestry center for tours
- one camp of 30 takes 1 hour tour
 - opposite camp does SOLV clean-up on the Interpretive Trail
 - camps switch activities at 2:00 p.m.
- 3:00 p.m.** Return to camps
- 3:30 p.m.** Camp ends for students

POST-TEST

Name _____

Camp Location _____

Describe in writing or by drawing, whatever you know about any of terms shown in the boxes below (use the back of this sheet if you need more room).

pollution
garbage dump
conservation
air
reduce
re-use
recycle

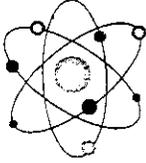


energy
potential energy
kinetic energy
solar energy
heat
light
chemical energy



water cycle
watershed
water critters
runoff

hydrogen
oxygen
molecule
acid
base
pH



electricity
battery
circuit
gasoline
dam
power plant
transmission
tower

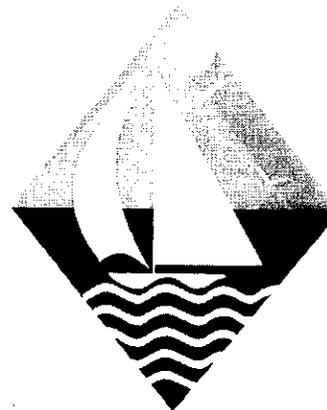


habitat
wildlife
salmon
food chain
predator
prey

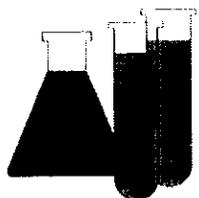
The Hydromania Junior Scientist Award

is hereby presented to _____

for a terrific job at BPA's Summer Science Camp!



By _____



This _____ *Day of* _____, 1995



40

HYDROMANIA III SUMMER SCIENCE CAMP

AWARD PRESENTED TO _____

For _____

On this _____ day of _____ 1995.



By _____



HYDROMANIA III SUMMER SCIENCE CAMP

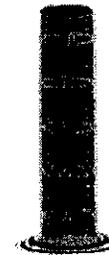
AWARD PRESENTED TO _____

For _____

On this _____ day of _____ 1995.



By _____



Day 10

Teacher's Guide

9:00 a.m. Depart Camp on Buses for Sternwheeler/Airport, breakfast on bus

9:30 a.m. Arrive Sternwheeler/Airport

9:45 a.m. Begin Sternwheeler Cruise or Young Eagles Flights

12:00 p.m. Board Buses for Blue Lake Park Lunch Site

12:30 p.m. Arrive Lunch Site

1:00 p.m. METRO Activity - Native American Necklace Making
(contact: Deb Scrivens at METRO 797-1700)

2:00 p.m. SOLV (Stop Oregon Litter and Vandalism) Clean-up

Students spend the last 1/2 hour of the camp picking up litter and placing in SOLV containers. The group that weighs in with the most litter wins a prize.

2:30 p.m. Board Buses and Return to Camp

3:00 p.m. Camp Ends