

CLASSROOM GUIDE

WETLAND

The following ideas can help you and your students make the most of your field trip to Fauntleroy Park, where you will find the "wetland" link in the water chain. The exercises are geared to **fourth-grade and fifth-grade** youngsters and may be simplified for younger students. See the "Any-Site Ideas" section of this guide for more activities.

REFERENCES

The following books can be helpful in guiding your study of wetland habitat:

- *Wetland Plants of Oregon & Washington* by B. Jennifer Guard
- *Plants of the Pacific Northwest Coast* by Jim Pojar and Andy MacKinnon
- *Adopting a Wetland: A Northwest Guide* by Steve Yates

BEFORE YOUR FIELD TRIP

EXERCISE #1: JIGSAW PUZZLE. Students create a jigsaw puzzle with a wetland theme. Start with an illustration of a freshwater-based ecosystem. Provide a photocopy on cover-weight paper for each student.

1. Color the scene with marking pens, discussing the various elements of the scene as they work.
2. Using a pencil, draw puzzle pieces on the back so that each piece contains at least one element of the scene.
3. Cut out the puzzle pieces along the lines drawn.
4. Trade puzzle pieces with another student.
5. Mix up the pieces and assemble the puzzle.

Questions you might ask as students assemble their puzzles:

- What do you think is the most important part of the puzzle? Why?
- What is your favorite part of the puzzle?
- What would happen if part of the puzzle were lost?
- Which pieces are "connectors" - the links between main elements?

EXERCISE #2: MAKING THE CONNECTION. Students use the image of connecting puzzle pieces as the basis of small-group reports on the importance of wetlands.

1. Divide the class into teams of two to four students.
2. Tell them they are to think of one question as they listen to the following basic information about wetlands, then, as a team, they will research the answer to their question and report to the class.
3. Read them the following information:

Think of our natural world as a giant jigsaw puzzle. Every piece is essential to the completed picture. Within this completed picture are many smaller pictures, and within each smaller picture are a number of essential pieces.

Watersheds are essential pieces in this big puzzle that is our earth. They are land areas that catch rain or snow and drain into marshes, streams, rivers, lakes, coves, or the ground. We can begin to understand the importance of a watershed by studying wetlands, the first link of the water chain.

A wetland is one of the most productive ecosystems in the world! It can be home to microbes, plants, insects, amphibians, reptiles, birds, fish, and mammals. A wetland is like a huge supermarket for the many animals that use it during part or all of their life cycles. It is the base of a food web, where small insects or aquatic animals feed off its rich organic materials and then become the food of larger animals.

Today, many scientists believe that wetlands also play an important role in maintaining a healthy atmosphere. The plants and soils in wetlands store carbon that would otherwise be released into the atmosphere as carbon dioxide.

4. Give teams a few minutes to decide what questions they want to explore and what process they will use.
5. Approve and modify questions, looking for ones that challenge students to learn more about the role of wetlands in watersheds and their importance.
6. Using one team's suggested process as an example, write the steps on the blackboard or on newsprint and invite other teams to suggest modifications until the class decides on a common process they think will work.
7. Agree on a deadline.
8. Provide reference materials (books, posters) and Internet access.
9. When all teams are finished, have them present their reports. Encourage class discussion.

EXERCISE #3: PLANT IDENTIFICATION. Students are introduced to the trees and other plants in the Fauntleroy Park wetland. During the field trip, they will identify several of them and understand how they contribute to the overall habitat.

1. Provide each student with a copy of the Fauntleroy Creek watershed topographic map. Discuss where the wetland is and pinpoint the area of the park that they will be visiting.
2. Divide the class into pairs and assign each pair two or more of the following plants they might find in or near a freshwater wetland in the Pacific Northwest:

Skunk cabbage	Dewberry	Water parsley	Western buttercup	Foxtail
Bracken fern	Spikerush	Leafy mitrewort	Red-osier dogwood	Dock
Reed canary grass	Indian plum	Herb Robert	Red elderberry	Salal
Salmonberry	Bog laurel	Red alder	Western red cedar	Horsetail

3. Provide field guides for students to find and report basic information about their plants.

AFTER YOUR FIELD TRIP

EXERCISE: WETLAND JOURNAL. Students use their worksheets from the field trip to create a journal. Provide paper, scissors, glue, and other art supplies, as well as copies of the "Plants Common to Pacific Northwest Wetlands" page of drawings included with this guide. Ask students to transfer the plant information they collected on the field trip into a journal and add corresponding drawings. Encourage them to be creative in designing and embellishing their journals. Ask them to respond in their journals to these or similar lead-ins:

- This wetland is important because.....
- I can help preserve wetlands by.....

CLASSROOM GUIDE

POND

The following ideas can help you and your students make the most of your field trip to Fauntleroy Park, where you will find the "pond" link in the water chain. The exercises are geared to **kindergarten and first-grade** youngsters and may be enhanced for older students. See the "Any-Site Ideas" section of this guide for more activities.

Explain to your students that the pond they will be visiting is rather small in comparison to the ponds they may have seen in books.

REFERENCES

The following books can be helpful in guiding your study of pond habitat:

- ***Around the Pond: Who's Been Here?*** by George Barrett
- ***Life in a Pond*** by Allan Fowler
- ***The Living Pond*** by Nigel Hester
- ***Pond & River*** (an Eyewitness book) by Steve Parker

A study of the frog life cycle (with emphasis on the Pacific tree frog) might also be helpful before your field trip. Here are a few references:

- ***Frogs and Toads and Tadpoles, Too*** by Allen Fowler
- ***Frogs*** by Gail Gibbons
- ***Frogs, Toads, Lizards, and Salamanders*** by Nancy Winslow Parker and Joan Richards Wright

BEFORE YOUR FIELD TRIP

EXERCISE: A GROUP STORY. Acquaint your students with pond habitat by showing them illustrations from reference books and describing in your own words the various details. Then write a group story from the perspective of a frog in a pond. Make it a fun, as well as informative, project. Write the story on newsprint or tape record it to hear after your field trip.

AFTER YOUR FIELD TRIP

EXERCISE #1: COMPARE AND CONTRAST DISCUSSION. Engage students in a compare / contrast discussion, drawing out what they observed on the field trip that was similar to and different from what they learned before their visit about pond habitat. You may want to summarize their points on the blackboard or on newsprint.

EXERCISE #2: POND STEWARDSHIP. Have the class create a storywall (see the "Any-Site Ideas" section of this guide) depicting the pond area as they saw it. Label things that responsible stewards could help take care of in order to keep the pond a healthy habitat, with an emphasis on what young children could do.

EXERCISE #3: ROLE-PLAYING. Shape a role-playing activity around the creatures that live in and near the pond. You might want to role-play the group story that students wrote before the field trip or work with whatever "plot" your students suggest to emphasize how plants, animals, and water are connected in a pond-centered habitat. You might want to extend the role-playing to include how the pond is connected to the "Wetland" and "Creek" links in the water chain.

CLASSROOM GUIDE

FOREST

The following ideas can help you and your students make the most of your field trip to Fenton Glen and Fauntleroy Park, the "forest" link in the water chain. The exercises are geared to **third-grade through fifth-grade** youngsters and some can be simplified for younger students. See the "Any-Site Ideas" section of this guide for more activities.

BEFORE YOUR FIELD TRIP

EXERCISE #1: WATERSHED FEATURES, PAST AND PRESENT. Students locate features of the watershed on a map and describe current features of the area, based on what the map tells them. Then they brainstorm what the area might have looked like in the past, based on historical information. Write their observations and predictions on the blackboard or newsprint with "Present" and "Past" headings.

What does this area look like now? Using the topographic watershed map included with this guide as a handout or overhead transparency, ask students to locate Fauntleroy Park, Fenton Glen, Fauntleroy Creek, and other features of the watershed. When you are satisfied that they have "the lay of the land," read the following description to check their map-reading skills and add to their "Present" information about the watershed.

Everett Fenton and Louise Studley married at the beginning of "the roaring 20s." Nearly 20 years later, they bought the 28-acre parcel that would become Fauntleroy Park, as well as land to the northeast that would be developed into Fauntlee Hills. Mr. Fenton had planned to build houses in the wooded ravine (as evidenced by the sewer lines in the park) but the steep slopes and creek tributaries prevented that use.

In 1972, the Fenton family sold the woods to the city and it became a natural public park. In memory of their mother, Louise and Everett's children created Fenton Glen ("glen" means a narrow valley) on Fauntleroy Church property at the west end of the park. Scores of houses, plus the church and YMCA facility, press in on all sides, making the park with its glen a welcome natural "oasis" in an urban neighborhood.

What might the area have looked like in the past? Select one or more students to read the following historical information about this riparian woods and summarize their "Past" observations about the watershed.

Before 1850, this area was a "climax" Douglas fir forest, meaning that fir trees dominated the area. The forest contained 1,000-year-old fir trees that stood as tall as 300 feet. Red alder, broadleaf maple, and red cedar trees grew where

the sun broke through the tall canopy. The groundcover acted like a sponge, soaking up rain and releasing the water slowly into the creek with minimal erosion. Understory plants in the riparian zone provided shade to keep the water cool.

Fallen logs made pools and waterfalls where tiny pieces of forest plants made a "nutrient soup" in the water and filled the water with bubbles of oxygen. Macroinvertebrates, fish, and other animals loved the creek and forest habitat! Old-timers tell of seeing black bears here but, more likely, they spotted red fox or raccoons. Neighborhood boys used to fish in the creek downstream of here, sometimes catching trout that measured eight or nine inches long.

Commercial farming and logging started shortly after the first white settlers arrived at Alki in 1851. They cleared land for crops, houses, streets, and businesses and aggressively logged the area's dense forest. Neighborhood elder David Galbraith recounts the morning that he and some friends were walking to Fauntleroy School down the lane that is now S.W. Barton Street. The children came upon a crew of men cutting down a fir tree that was about nine feet across. To avoid injury, the loggers made the children stay put until they had felled the tree. When allowed to pass, the David and his friends convinced one of the men to come to school with them to explain why they were late. That tree was the last old-growth fir in these woods - and it was cut for firewood!

Extensive logging opened the forest canopy to sunlight, enabling many species of plants and trees to compete in the altered habitat. Over time, people and birds introduced many plants not native to this area, some of which have taken over and now threaten the survival of these woods.

EXERCISE #2: WHY TREES ARE IMPORTANT. Students learn about the natural life cycle of a forest, explore why trees are important in an ecosystem, and are introduced to why invasive non-native plants are a major concern in urban forests.

Forest Life Cycle. Write each component of the forest life cycle on a Post-it and stick them in random order on a blackboard or newsprint. (If you divide the class into small groups, make as many sets as you have groups and post them around the room.) Ask the class as a whole or the small groups to organize the components into a circle to depict the forest life cycle. Then ask the class or small groups to explain their choices. To conclude, make any necessary corrections to the sequence.

Why are trees important? Brainstorm answers to this question, summarizing student responses on the blackboard or newsprint. Draw out the following key points:

- Trees make other living things possible through their natural life cycle.
- Trees absorb carbon dioxide - the gas we exhale - and through photosynthesis release oxygen - the gas we breathe - back into the air.

- Without trees to process carbon dioxide, this "greenhouse gas" builds up in Earth's atmosphere, where research suggests it is a major contributor to global warming.

How does ivy kill trees? In addition to logging and farming, white settlers introduced English ivy, Himalayan blackberry, clematis, and other non-native plants to Puget Sound. These "invasives" grow so well in our climate that they threaten to destroy many of the "native" species in our urban woods. Sketch the following process on the blackboard or newsprint, asking questions to draw out students as you go:

1. English ivy steals sunlight from native groundcovers and understory bushes.
2. Without photosynthesis, beneficial natives die - but not the ivy.
3. As ivy vines climb tree trunks, their roots open the bark to disease and may also steal a tree's sap.
4. A tree weakened by ivy and burdened with its weight eventually blows down and dies. But the ivy lives on!

EXERCISE #3: SCAVENGER HUNT. Engage your class in developing a scavenger hunt to use as an additional or alternative exercise during your field trip. Brainstorm what they might look for in the woods, listing items on the blackboard or on newsprint, then fine-tune the list to make the hunt challenging but not *too* challenging. Plan to work in teams, with one adult per team. Decide on the "rules" of the hunt (including staying on the trails) and any prize.

AFTER YOUR FIELD TRIP

EXERCISE #1: PAPER FOREST. This craft project spotlights Douglas fir as the historic climax species of forests in the Puget Sound area and its continued dominance in the woods associated with Fauntleroy Creek. Write the term "climax species" on the blackboard or on newsprint, then ask these questions:

Q: What is a "climax species"?

A: The tree or other plant that outgrows and outlasts all other species in the forest or woods.

Q: What was the climax species of Puget Sound forests when the first white settlers arrived?

A: Douglas fir

Q: What is the climax species now in Fauntleroy Park?

A: Douglas fir

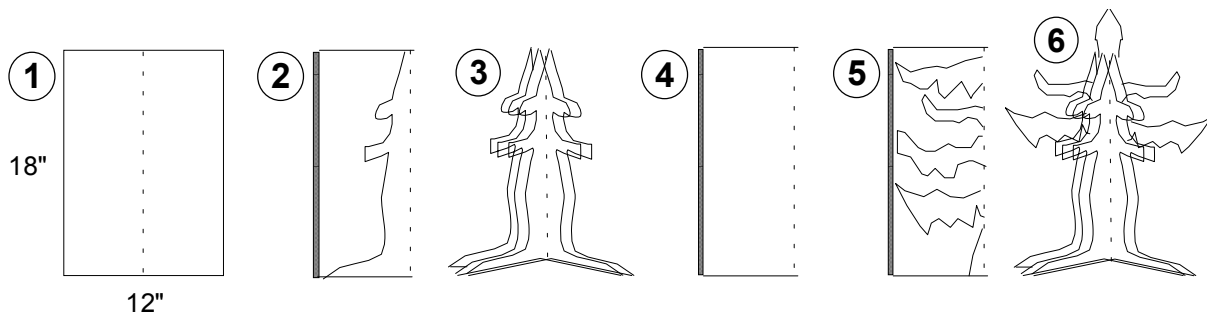
Provide students with the supplies and equipment listed to make tabletop Douglas firs. Photocopy the instructions to show on an overhead transparency.

Each student will need

- three 12" X 18" sheets of brown construction paper
- one 12" X 18" sheet of green construction paper
- a pair of scissors
- a pencil
- a glue stick
- access to a stapler.

INSTRUCTIONS FOR CREATING A TABLETOP DOUGLAS FIR:

1. Fold one sheet of brown paper in half lengthwise.
2. On the fold, draw half a trunk with a wide "foot" and two main branches. Cut it out. Repeat with the other two sheets of brown paper.
3. Align the "feet" and staple the trunks together along the fold to make a six-legged trunk that will stand on its own.
4. Fold the sheet of green paper in half lengthwise.
5. On the fold, draw branches of different sizes and shapes, then cut them out. Remember that the tips of Douglas fir branches usually turn up.
6. Glue the branches around the trunk to finish the tree. If you like, write a "stewardship tip" on the trunk.



Cluster the trees into a forest to enjoy in your classroom. After a few days, let students take them home and encourage them to talk about the project around the dinner table.

EXERCISE #2: LEAF RUBBINGS. Making crayon rubbings of leaves is an excellent way for children to begin to take a close look at plant species, identify them, and learn something about their role in the forest habitat. You will need paper, peeled crayons, and a flat, hard surface. If you make leaf rubbings during the field trip, provide each

student with a clipboard. If you make them back in the classroom from leaves collected on the field trip, use a tabletop or desktop. The clearest images will be of flat leaves that have a pronounced relief (such as bigleaf maple). Perfect this process so you can demonstrate it to your class:

1. Place the leaf on a flat, hard surface.
2. Place a lightweight sheet of paper on top of it.
3. Hold the paper firmly and rub over it vigorously with the side of a crayon.
4. Refer to a field guide to label the rubbing and find out something of the plant's role in forest habitat (such as erosion control, food for birds, or shade for the creek).

To simplify this activity, you might want to limit all collecting to leaves and sprigs of evergreen that youngsters find on the ground. Or engage your students in making these stewardship decisions:

- Shall we collect fallen leaves only?
- Shall we pick fresh leaves from invasive, non-native plants only (such as English ivy, cherry laurel, Himalayan blackberry, or English holly - ouch!)?
- Shall we pick any fresh leaves we want?
- What shall we do when we finish with the leaves (return to the woods? put on the school ground where they can decompose into soil?)?

CLASSROOM GUIDE

CREEK

The following ideas can help you and your students make the most of your field trip to the viewpoint above Fauntleroy Creek, the freshwater link in the water chain. The exercises are geared to **fifth-grade** youngsters and may be simplified for younger students. See the "Any-Site Ideas" section of this guide for more activities.

BEFORE YOUR FIELD TRIP

EXERCISE: CYCLES IN NATURE. To begin discussion of cycles in nature, ask these or similar questions. Summarize as appropriate on the blackboard or on newsprint.

- What is a cycle? How would you define it?
- What cycles can you think of that occur in nature - that are happening around you every day? *Possibilities include*
 - *the daily cycle: dawn to day to dusk to night to dawn again*
 - *the seasonal cycle: winter to spring to summer to fall to winter again*
 - *the water cycle: rain to evaporation to rain again*
- What do these different cycles have in common?

Now focus the discussion on the stages of the salmon cycle.

- What are the stages of the salmon's life cycle? *Write each stage on a Post-It with a heavy marker and stick these labels at random on the blackboard or on newsprint.*
- Have we missed any stages? *Add any missed stages to the labels.*
- What should be the order of these stages? *Start with one student's arrangement and correct or okay it as a class.*

Remind students that they will be visiting a freshwater creek.

- During which of these life-cycle stages do salmon live in freshwater?
- What might happen to salmon if the creek somehow disappeared?
- How might the salmon's life cycle be affected if the creek were no longer clean - if it were full of silt from dirty runoff, for example, or polluted with chemicals?
- What things might people do to make the creek not a good place for salmon during their time in fresh water? *Possibilities include*
 - *Dump oil or anti-freeze where the rain will carry it into the creek.*
 - *Use fertilizers, pesticides, or herbicides where they will run off into the creek.*
 - *Build dams or other barriers that block migrating smolt or spawners.*
 - *Remove trees and other plants whose roots keep soil from washing into the creek.*
 - *Trim bushes back along streambanks, letting sun warm the water.*

- At what stages do you think salmon are susceptible to predators such as eagles or raccoons?
- What do salmon need in order to increase their chances of surviving predators during their time in fresh water?

AFTER YOUR FIELD TRIP

EXERCISE: DIAMANTE. As a class, in small teams, or individually, students create a "diamante" - a seven-line poem in the shape of a diamond - and a drawing (in a circular or diamond shape) that illustrates both subjects of their poem.

On a transparency or handout, give students the following example of an illustrated diamante (which has "salmon" and "eggs" as its two subjects) and instructions for creating their own diamante.

salmon

silver, shiny

swimming, jumping, eating

ocean, creek - redd, gravel

laying, swaying, hiding

round, squishy

eggs



HOW TO CREATE A DIAMANTE:

Line 1: One noun that is the opposite of Line 7.

Line 2: Two adjectives describing the subject of Line 1.

Line 3: Three participles (words ending in "ing") about the subject of Line 1.

Line 4: Two nouns about the subject of Line 1, a dash, and two nouns about the subject of Line 7.

Line 5: Three participles (words ending in "ing") about the subject of Line 7.

Line 6: Two adjectives describing the subject of Line 7.

Line 7: One noun that is the opposite of Line 1.

Ask students to share their creations with the class. So that they have adequate time to fine-tune their work, you may wish to schedule reporting for the following day.

CLASSROOM GUIDE

BEACH

The following ideas can help you and your students make the most of your field trip to Cove Park, the beach link in the water chain. The exercises are geared to **kindergarten through second-grade** youngsters and may be enhanced for older students. See the "Any-Site Ideas" section of this guide for more activities.

REFERENCES

The following books can be helpful in guiding your study of beach/nearshore habitat:

- *Exploring the Seashore in British Columbia, Washington, and Oregon: A Guide to Shorebirds and Intertidal Plants and Animals* by Gloria Sniveley
- *Seashore Surprises* by Rose Wyler
- *A Salmon for Simon* by Betty Waterton
- *Discovery Book for the Seattle Aquarium* by Nancy Field and Sally Machlis

BEFORE YOUR FIELD TRIP

EXERCISE #1: TYPES OF NEARSHORE HABITAT. Using posters or reference books, show students examples of the four types of nearshore habitat: rocky seashore, sandy beach, cobblestone beach, and mud flat. Consider what these habitats have in common and what is unique about each. Tell students that they will be visiting a sandy beach and then look at that illustration more closely, calling out its features.

EXERCISE #2: PREDATORS AND PREY, PART ONE. Partner readers with non-readers and give a copy of the "Predator/Prey Relationships" worksheet included with this guide to each pair. Tell them that all the animals and plants shown might live on or near the sandy beach they will be visiting at Cove Park. One thing eats another, though. Brainstorm definitions of "predator" and "prey" until reaching a consensus. Then ask students to draw an arrow in pencil from each predator to its prey on the worksheet. Tell them guesses are okay for now. Point out that one predator may eat more than one prey, and one prey may have more than one predator. Save these sheets to work on after your field trip.

ADDITIONAL ACTIVITIES DURING YOUR FIELD TRIP

Choose one or more of these additional beach activities, depending on your time and learning objectives:

- Gather at the logs, ask students to close their eyes, and report what their senses (sound, smell, and feel) tell them about where they are.
- Imagine this cove many years ago when Native Americans beached a real sealing canoe here. What would you see? What has changed?
- Using charcoal drawing pencils, recreate elements of the habitats they discovered in the cove - plants, logs, sandy beach, high-tide line, the creek, ferry pier, Puget Sound, the sky, and the mountains to the west. Drawing will help them attend to details.

AFTER YOUR FIELD TRIP

The following exercises are grouped in clusters. In the first, students create and embellish a storywall of a sandy-beach habitat; use these exercises over three or four days. Interdependence is the common thread in the second cluster. The third is made up of child-developed games to dramatize learning.

STORYWALL

EXERCISE #1: BASIC FEATURES. Ask the students to refer to the charcoal drawings they made of Cove Park to create a storywall (see the "Any-Site Ideas section of this guide) depicting the basic features of a sandy beach. Make it broad enough to include the mouth of the creek and a bit of open ocean.

EXERCISE #2: HABITATS WITHIN A HABITAT. Tell students that, in this exercise, they will be looking for a "mini-habitat" or "a habitat within a habitat" - a place to live that is in some way different from other places to live. Ask them to take a close look at their storywall so far. Then brainstorm the "habitats within a habitat" that they saw at Cove Park, listing them on the blackboard or on newsprint. Agree on a symbol to identify each mini-habitat (such as a wavy line for Puget Sound) to help non-readers understand. Sketch the symbol for each habitat on a small piece of paper, label it, and add these identifiers to the storywall.

EXERCISE #3: BEACH CREATURES. Begin with what the students observed about beach creatures during their visit to Cove Park. Working as reader/non-reader partners, ask them to use posters and book resources in the classroom to research the kinds of animals typically found in a Pacific Northwest sandy-beach habitat, especially those that live in the sand. Monitor their choices to ensure variety. Ask each pair to draw one color picture of its animal on a small piece of paper and prepare one fact about it to share with the whole class. As pairs report their findings and show their drawings, add them to the storywall.

EXERCISE #4: VOCABULARY. Brainstorm with the class what action words would be natural to use in moving from habitat to habitat on their storywall. For example, getting from the logs to the sand might be "tripping" or "hopping." Moving from the tideline into Puget Sound might be "running" or "dashing." Tell students that they are to make up an action riddle or clue for the rest of the class to solve in order to move from one "mini-habitat" to the next on the storywall.

Divide the class into teams and assign each team one of the habitats. Ask them first to brainstorm descriptive action words for their habitat, then choose one of the words to make into a clue. For example, "shade" to describe the "bushes" habitat might become the clue, "shading beetles from the hot sun." Tell students to evaluate their phrases as a team for clarity and accuracy. Emphasize that the goal is to be challenging but not confusing. Reconvene as a group and decide on a logical sequence to move through the storywall. Then ask each team to read its riddle in turn, with the class trying to solve it. Revise any clues that are confusing or too difficult.

EXERCISE #5: VISITORS. Invite another class to visit the storywall. Ask your students to share some of the things they learned about sandy-beach habitat and then engage visiting students in solving the riddles to locate each habitat on the storywall.

EXERCISE #6: SALMON LIFE CYCLE. Divide the class into teams and assign each team one stage of the salmon life cycle. Using posters or reference books, ask each team to research and draw its assigned stage. Reconvene as a group and ask each team to report its findings and show its drawing. Add the drawings to the storywall so that students understand where each stage takes place in the watershed and ocean.

INTERDEPENDENCE

EXERCISE #1: PREDATORS AND PREY, PART TWO. Return the "Predator/Prey Relationships" worksheets to the pairs of students that did them before the field trip. Ask them to review their decisions in light of what more they have learned about sandy-beach habitat. Use a pen this time to draw over or change arrows. Start with a fresh worksheet (make an enlarged photocopy if you like) and engage the class in accurately depicting the predator/prey relationships. If opinions differ, use the student pairs from "Beach Creatures" (Exercise #3) as authorities on their animals.

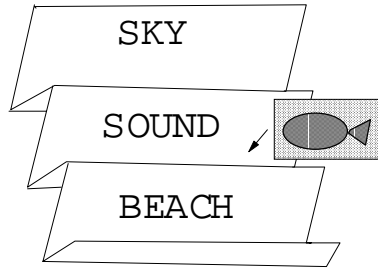
EXERCISE #2: A SALMON FOR SIMON. Read the story to the class, then engage students in a compare/contrast discussion. On the blackboard or on newsprint, summarize similarities and differences between Cove Park and Simon's setting. Emphasize the relationship among water, salmon, and Simon's stewardship (digging the channel), the creatures in the beach/nearshore habitat, and how they are

interdependent. Stress the concept of a safe channel and how people are involved in helping ensure the survival of salmon in both freshwater and saltwater habitats.

GAMES

EXERCISE #1: THREE-LAYERS CARD GAME

Divide the class into small teams and give each team a large sheet of construction paper. Direct the teams in folding their paper accordion-style into six horizontal panels. Ask them to write "SKY" in pencil across the second panel, "SOUND" across the fourth panel, and "BEACH" across the sixth panel. Lay the accordion on the table where all can reach; it should have three "peaks" and three "valleys," one for sky, one for sound, and one for beach.



Provide each team with a photocopied page of small drawings of animals and plants typically found in and near a Pacific Northwest sandy-beach habitat (preferably student drawings made in an earlier activity). Ask each team to make a deck of cards by cutting out the drawings and gluing them to small pieces of colored paper.

1. Place the deck of cards face down where all team members can reach.
2. Pick a card in turn.
3. Place the card in the "valley" for where that plant or animal would live.
4. Score one point for each correct placement.

Involve another team or the whole class in resolving disputes. You might play this game with one team competing against another.

EXERCISE #2: A MEDLEY OF CRITTER ROLE-PLAYS

Moon Snail Lick: The child who is the clam hunches down low. The child who is the moon snail pretends to bore a hole in the clam with its rough tongue (an arm). The moon snail pulls the soft inside (a scarf) out of the clam.

Chiton Curl: Children in a group pretend to cling to a large rock, belly-side down. One child (or an adult) gently lifts the chitons off the rock. The chitons curl up (slow-mo), then slowly stretch out and turn over to cling again. Repeat.

Barnacle Bicycle: Children in bicycle-exercise position (on back with hips in air supported by arms, legs bent) are barnacles on a beach. As the tide comes in (a child or adult waving scarves and making wave noise), the barnacles open up and wave their feathery feet to stir bits of food toward their mouths. Barnacles close tight as the tides goes out. (Option: Tape feathers to soles of feet!)

Crab Pinch and Scuttle: Children pretend to be little crabs hiding together under rocks to keep moist at low tide. When the tide comes in (role-play as above), the crabs scatter and scuttle (crab-walk sideways) and pinch a piece of food as they cross a line of tape where a child pretending to be an otter waits to try to catch them. The crabs return to their safe place if they can. Use pretend food or real snack food. The otter should move in slow motion, as if swimming against a tidal current. (Option: Crabs that are caught turn into otters.)

EXERCISE #3: A BOARD CARD GAME

To use a "helps and hazards" board game to focus on salmon, have students create as many cards as they can think of showing things that help salmon grow, survive in the ocean, and return to spawn. Create similar cards with hazards to salmon, including natural predators and things that people do because they don't know better or aren't thinking clearly. Then create a pathway with many "squares" to get to the ocean and back (START is also FINISH). Devise "pieces" for three or four players and provide a die to roll.

1. Roll the die and move your piece that many squares forward on the pathway.
2. If you land on a "hazard," draw a "hazard" card, read (or describe) it, and lose a turn.
3. If you land on a "help," draw a "help" card and read (or describe) it.
4. The first player to return to spawn wins.

(Option: Devise a point system for practice with addition and subtraction.)

A variation is to use the deck of "helps and hazards" cards only and work in pairs:









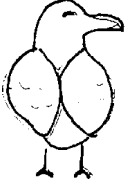





1. Shuffle the deck.
2. Draw a card and read it (or describe the picture).
If it's a "help," take a prize (a cutout of a salmon, for example).
If it's a "hazard," give back a prize.
3. When the cards are gone, the player with the most prizes wins.

EXERCISE #4: MIGRATION MAZE

To role-play salmon migration in a big way, set up a maze by taping sheets over tables in tunnel fashion. Include dead-ends and a fish ladder using stairs or chairs. As you build the maze, talk with students about how returning salmon know where "home" is. Emphasize that scientists don't know everything about how they do it but that smell is very important. Hang vinegar- or bleach-soaked strips of cloth at dead-ends in the tunnel and sprigs of rosemary or mint along the safe route home. Returning salmon also need light (a flashlight shown from above) to guide them. Children and adults might role-play predators and other hazards such as an oil spill. Children make their way through the maze and, when they reach home, celebrate with a joyful leap or a song. (Option: Play a tape of ocean sounds in the background.)

PREDATOR/PREY RELATIONSHIPS

The animals and plants in a sandy beach habitat are inter-dependent - they depend on one another to survive. They can be predators or prey or both. After observing the beach, draw lines connecting the animals and plants you think are predators to the ones you think are their prey.

 WELK		 SEA STAR
 BARNACLE		 MUSSEL
 SALMON SPAWNER		 MOON SNAIL
 CRAB		 SEA OTTER
 SEAGULL		 BEACH GRASS
 SALMON SMOLT		 SAND HOPPER
 PLANKTON		 CLAM

COMPLETED BY _____ DATE _____

CLASSROOM GUIDE

COVE

The following ideas can help you and your students make the most of your field trip to Captain's Park, the cove link in the water chain. The exercises are geared to **kindergarten and first-grade** youngsters and may be enhanced for older students. See the "Any-Site Ideas" section of this guide for more activities.

BEFORE YOUR FIELD TRIP

EXERCISE #1: CAPTAIN'S PARK, PAST AND PRESENT. Students locate Captain's Park on a map and describe current features of Fauntleroy Cove, based on what the map tells them. Then they brainstorm what the area around the cove might have looked like in the past, based on historical information read to them. Write their observations and predictions on a poster with "Present" and "Past" headings.

What does this area look like now? Using the simplified watershed map included with this guide as a handout or overhead transparency, help students locate Captain's Park, Fauntleroy Creek, and other features of the area around the cove. Brainstorm what the map tells them until you are satisfied that they have "the lay of the land," then read the following description to check their map-reading skills and add to what they know about the site. Help them understand unfamiliar words.

Captain's Park is a small neighborhood park just north of Fauntleroy Creek. It sits on a bluff overlooking the ferry pier across the street. Looking west from the park, toward the setting sun, you would see the ferry pier, Fauntleroy Cove, Lincoln Park, and the Olympic Mountains. Looking east from the park, toward the rising sun, you would see a not-very-wide street lined with houses on one side. Captain's Park doesn't have swings, a climber, or ball fields. It is just a patch of green with a bench, trees, bushes, and a stone marker. Neighbors who keep up this park have added a sign and birdhouses.

Can you guess why neighbors chose the name "Captain's Park"? Answer: It honors all the captains who have plied local waters.

What might the area have looked like in the past? Ask the students to listen carefully as you read the following historical information about the site:

Before white people began to build houses here in the 1850's, this area was all forest. It had no roads, no ferry, and no permanent homes. It was full of life, though. Groups of Salish Native Americans came here in the summer and fall to fish, hunt, harvest other food, and stock up on supplies. They paddled their cedar canoes across Puget Sound into what is now called Fauntleroy Cove. The cove offered a place protected from strong winds and rough seas. Also, by

keeping a lookout at the north point of the cove and another at the south point, they could know when members of an unfriendly tribe might be coming to raid their camp.

Up the hill near Fauntleroy Creek, where freshwater and saltwater came together, they built simple shelters from the rain. One kind was a lean-to, which they made by leaning branches against a large tree and covering them with boughs. Another kind was more like a tent, which they made by tying branches together to make a frame, then covering the frame with mats woven of cattails.

They found an abundance of food here, especially the salmon that they smoked over open fires to preserve it for the winter. They also took the supplies they needed, such as the bark and wood of cedar trees to make clothing, tools, and canoes and grasses and reeds to make baskets. The habitat here also provided berries, birds, roots, shellfish, bears - a seemingly endless bounty of gifts made possible by the clean water of the creek and cove.

Review the information with general and specific questions and add the students' answers to the "Present and Past" brainstorming lists. Help them understand and use new words.

- What was here before the houses and streets of today?
- How was the land different?
- Why was the area a good place to get food and supplies?
- What made everything that was here grow? What was essential to all life here?
- If you could have been one of the First People to come to this area, who would you be and why?

EXERCISE #2: INTRODUCING THE STORY. Read the following paragraphs to introduce the spirit story that you will tell on your field trip to Captain's Park:

Everything important to native peoples on Puget Sound had a spirit, and they created stories to honor and teach about these spirits and to explain storms, volcanoes, earthquakes, and other natural events.

This spirit story uses traditional elements to relay information about this area and the importance that the First People placed on water and spiritual beliefs. By bringing the lesson forward in time, the story also emphasizes the importance of taking care of our natural resources today.

What can we remember? Only what we have learned. And how do we learn? By watching, listening, reading - being told in some way.

Native American children who lived on Puget Sound many years ago didn't have a language that was written down, so they couldn't learn by reading. They learned by watching how things were done - how to fish and hunt, sew and weave, build and carve, take care of one another and the earth. To learn about their past and the spirits around them, they listened to stories told by their elders - their grandparents and other older tribe members. By listening over and over to stories, they could remember and teach others.

Stories like the one we will listen to when we are in Captain's Park are still a good way to learn.

NOTE: Practice reading the story until you can tell it - as a storyteller would. Feel free to depart from the text, as long as you stick to the basic plot.

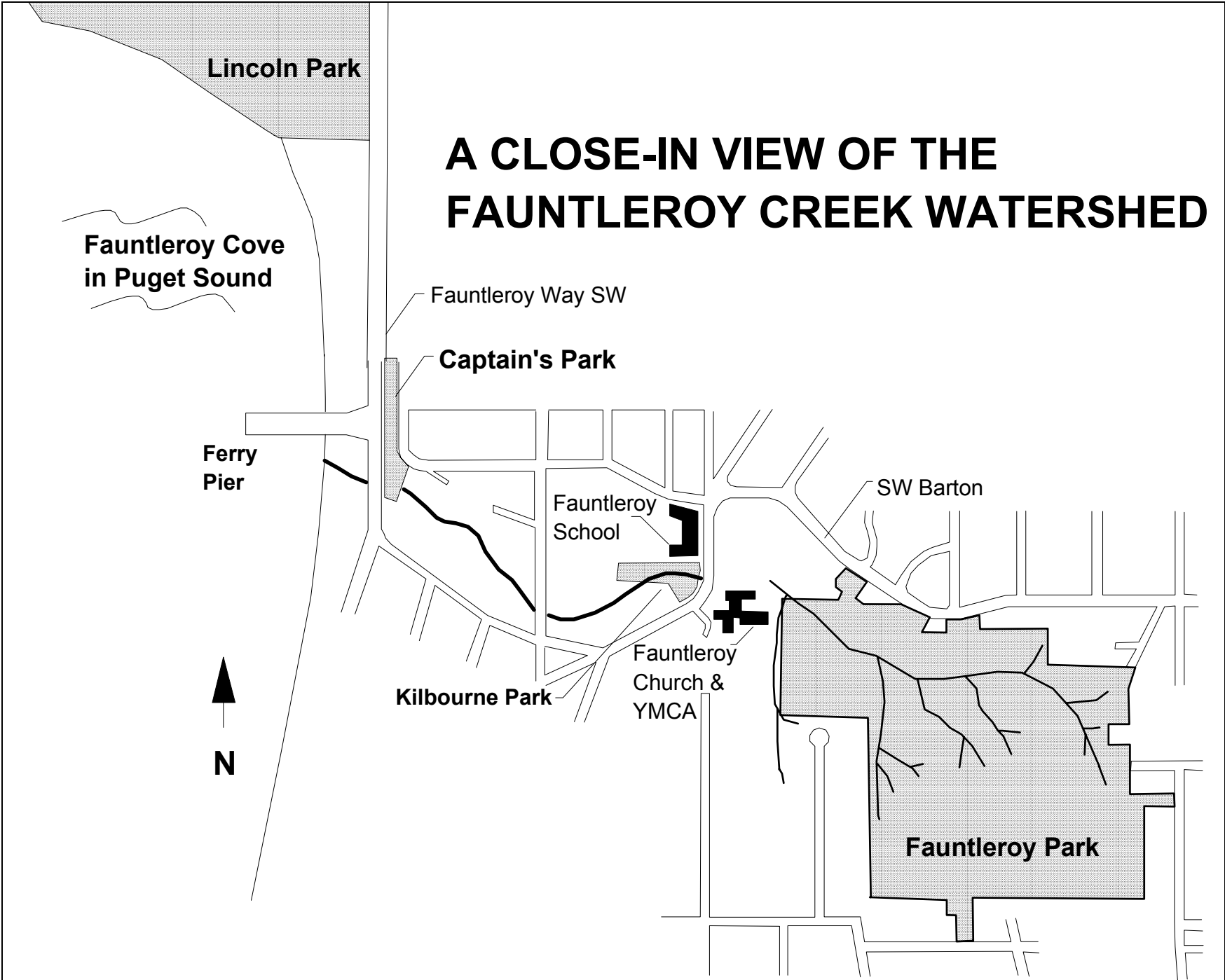
AFTER YOUR FIELD TRIP

EXERCISE #1: OBSERVATIONS AND PREDICTIONS. Students check their observations and predictions, as well as try out new words. Put up the "Present and Past" poster for all to see and encourage the students to talk about which observations and predictions were correct and which were not. What needs to be changed or crossed off our lists? What could we add?

EXERCISE #2: HANGING IMAGES. Students translate what they have learned into simple visual images. Give each student a piece of tag or other sturdy, light-colored paper. Ask them to draw a picture on one side of something they learned about what the area looks like now. On the other side, draw a picture of something they learned about what the area probably looked like many years ago. When everyone is finished, ask them to think about answers to these questions, using phrases or whole sentences:

- What have you drawn?
- Why did you choose it?

As a class or in small groups, have students show what they have drawn and tell why they chose it, then hang their drawings from the classroom ceiling, individually or combined into mobiles.



CLASSROOM GUIDE

ANY-SITE IDEAS

The following exercises and projects are suitable for any site in the watershed. They might help students understand a particular link in the water chain or pull together all they have learned about the watershed.

MY HABITAT

Begin to cultivate an understanding of "habitat" in young children by brainstorming a definition and then what they need from their personal habitat (their home and nearby neighborhood). Write their needs on the blackboard or on newsprint. You might also ask them to draw their personal habitat. Move on to a comparison of their habitat needs with those of fish or other animals that they have in the classroom or at home.

STORYWALL

Students create a large-scale depiction of what they have learned about one or all of the sites they visited in the water chain. Your storywall might focus on plants and animals found on the land and in the different bodies of water. It might focus on a Salish summer camp or tell about the history and development of an area. A storywall is a highly versatile framework for any age of student.

To prepare the storywall, use butcher paper of different colors to create a backdrop. You might want to use a long, wide piece of blue, overlaid with pieces of brown and green through the middle to create the earth with sky above and water below. Cut heavy white paper into small pieces (say 2" X 3") on which children can draw items for the storywall. Provide markers, crayons, and/or colored pencils for drawing and scissors for cutting.

To present the topic of the storywall to students, brainstorm with them what they might draw. For example, for a Salish storywall, they would need trees and bushes, salmon and eagles, canoes and shelters. Ask each student to draw a single item for the wall, color it, and cut it out, then help them place their items on the storywall in an appropriate spot. You may want them to label their items. A storywall may take more than one session to finish.

To use the storywall, ask students to work individually or in small groups to write stories using the elements they see on the storywall. Kindergarten and first-grade children love to work in small groups, identify an animal or other character from the storywall for each child to "be," and create stories they can act out, involving everyone in the group. For example, they might recreate the Salmon Boy story they heard at

Captain's Park. Leave the storywall up as long as you are on the water-chain unit to emphasize the importance of water or how everything is connected in a habitat.

WORD SEARCH

Create a grid, say 12 squares across and 12 squares down. Hide in this grid key words associated with one of the links in the water chain, such as wetland habitat. The older your students, the more challenging you can make this game (such as diagonal or backwards words). Duplicate for everyone in the class. Ask students to find as many words as they can in the grid and write them at the bottom of the page.

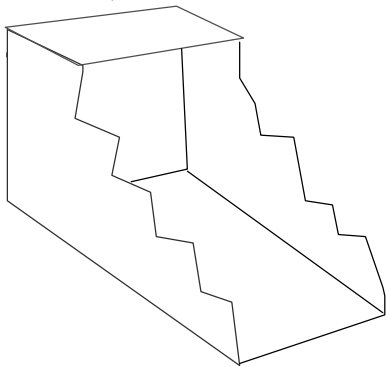
WATER CYCLE POETRY

To understand the basics of the water cycle, read *Waterdance* by Thomas Locker to the class, then use it as a springboard to free-form poetry developed in small groups. Emphasize the various parts of the water cycle and the concept of a watershed. Brainstorm key words and phrases describing water, then arrange all or some of them into a poem. Or brainstorm descriptive words and phrases for each letter (W, A, T, E, and R) and edit them into a poem. For example,

*Wet,
Always flowing,
Trickling down.
Everlasting
River.*

HABITAT DIORAMA

Start with a large appliance box (such as a refrigerator box) and cut it diagonally as shown, leaving a small section at the top for a "roof." Direct students in painting a water-related habitat inside the box. Add appropriate features made with paper, ribbons, or other art materials or natural objects such as rocks. A nearshore / beach



habitat, for example, could have driftwood, seaweed, grasses, and sand with clouds overhead. A creek habitat could include clay or papier-mâché salmon fry suspended with string above gravel with wired ribbon to resemble current.

As the project progresses, engage students in discussing the habitat they are constructing. For instance, "Why do smolt stay in saltwater coves? What do they eat? Where do they go from there?" Talk about the possible affect of unhealthy things that people do (such as washing a car on the street or leaving grass clippings for the tide to take away).

When finished, encourage each student to spend quiet time at the diorama, imagining what living there might be like. Create dioramas for each link in the water chain and connect them with streamers. Or connect them by developing a story with a salmon as the main character.

HOW A WATERSHED WORKS

Ask one student to read the following information and ask the rest of the class to close their eyes and imagine what they hear:

A watershed is like a bowl; all the water that comes into it runs down the sides of the bowl and collects in the bottom, the lowest point. In the Seattle area, the lowest point for water is Puget Sound. Many small watersheds make up the Puget Sound watershed and one of them is the Fauntleroy Creek watershed.

Together with the wetland and pond in this watershed, the forest acts like a filter. It filters some of the pollutants out of the rainwater that runs off streets, parking lots, and roofs on its way to the creek, the lowest point in this watershed. The forest is also a sponge that absorbs and releases water slowly after a rain. Because it is a damp, shady place, the forest is a home for many species of animals and plants and a nursery for rearing young.

To bring this general concept to life, assist the class in making a model of a watershed. You will need

- several sheets of newspaper
- a large, black plastic garbage bag
- a spray bottle filled with water.

Have prepared the following labels. Add to them as you see fit and laminate them if you might want to use them again.

GLACIER	POND	LAKE	TRIBUTARY	BEACH
ESTUARY	RIVER	STREAM	PUGET SOUND	WETLAND

Construct your watershed on a table or on a piece of plywood, Foamboard, or sturdy cardboard if you want to keep it for awhile.

- Wad sheets of newspaper and arrange them in the shape of a mountain or mountain range.
- Cover the newspaper mound with the plastic bag (split if necessary to make it big enough).
- Lay rolled newspaper along the edges of the bag to keep water off the floor.
- Spray water on the top of the mountain and watch where it goes.

Engage your students in questions and answers as they examine their model and label its parts. As time permits, start over and make a more complex model or refer to a

topographical map to construct a rough model of the Fauntleroy Creek watershed. Draw students out on the ways people influence the health of a watershed.

DISCOVERING AND DEPICTING A HABITAT'S STORY

Conduct detailed research on a creek, park, or other natural habitat in your area. Write and the story of its history and what is going on now to protect and restore it. Take photos or make drawings to illustrate it. Create a bulletin board for a hallway or the lunchroom of your school or make a portable display that students could "market" to a local bank, museum, community center, or neighborhood service center.

A variation on this idea is to document in text and photos a watershed project planned by another class or group. It might be streambank vegetation on a creek, for instance, or graffiti cleanup in a park. Work all the angles for learning, including writing a proposal to fund your documentation project!

A SERVICE LEARNING PROJECT

Invite community volunteers or agency staff members to meet with your class to discuss possible service learning projects that students could organize and carry out. They might develop art and text for interpretative signs along a park nature trail, for example, or create a handout on the salmon cycle for visitors to a creek during spawning season. Choose something that is achievable, while challenging students to apply and improve a variety of technical and people skills.

THE BIG STEWARDSHIP PICTURE

Each link in the water chain presents an opportunity to introduce and discuss the importance of taking care of our natural world and encourages children to be good stewards. When your students have visited all the links in the chain, use such questions as the following to help them see the big stewardship picture and where they fit:

- Why is knowing about the different water habitats we've studied important?
- What was your favorite site and why?
- Did you see anything that needs to be done there to make it a better place for wildlife?
- Why is learning about history important?
- Why do we especially need to learn about salmon?

The "Things You Can Do" list included with this guide suggests several ways that youngsters can be positive stewards of water resources in general and our salmon in particular. You might want to

- use it as the basis for brainstorming more ideas
- choose one of the projects to do as a class
- send it home to prompt discussion around the dinner table.

THINGS YOU CAN DO TO HELP THE SALMON

We all live in a watershed - a place where rainwater runs downhill and collects in a creek, river, lake, or bay. This water and the plants it nourishes create a habitat where salmon and many other critters live, in the water and on the land. They all depend on people to keep the water clean and the habitat healthy. Here are ways you can help:

STOP, LOOK, AND LISTEN

If you develop a habit now of using your senses to explore our natural world, you'll always find ways to protect it.

- Watch what happens during a rain - how the water flows, what it picks up along the way, and where it goes.
- Listen to birds when they come to a tree or bush to feed.
- Smell the flowers in spring, the hot earth in summer, and the wet leaves in fall.
- Feel the difference between the leaves on one bush and the leaves on another.

LEARN ABOUT THE SALMON LIFE CYCLE

The more you know, the more you can pass along to others.

- Look at pictures or watch a video to understand how salmon live, migrate, and reproduce.
- Visit a creek or river to see what makes a habitat healthy for salmon.
- Raise salmon in your classroom and watch them grow day by day.
- Read or listen to salmon stories handed down by the First People.
- See the salmon when they return to spawn - and bring others to see and learn.

SET A SALMON-FRIENDLY EXAMPLE

What you say and do can influence others.

- Use only as much water as you need; don't let it run.
- Try not to buy or ask for things that turn right into garbage; learn how to choose things that last a long time or that come in containers that can be recycled.
- Never throw your wrappers or bottles on the ground; pick up after those who do.
- Take a walk in the park with friends or family members and share what you know about what you see.
- Ask questions; everyone will learn from the answers.

IMPROVE HABITAT FOR ALL WILDLIFE

The better a habitat is for everyone who lives there, the better it is for salmon.

- Put out food for the birds during winter storms.
- Plant a tree, bush, or flowers that will make seeds or berries for wildlife.
- Grow your own wildlife-friendly trees, bushes, or flowers and plant them.