

# BEGINNING IN THE WATERSHED

FOR SEA: Investigating Marine Science - Grade 4

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### Unit I: Estuaries

- 1. Water: The Constant Traveler ..... 37**  
 Students construct a water cycle mobile and diagram, complete a short reading and questions, and conduct an experiment.
- 2. Finding Your Ecological Address ..... 67**  
 Students develop a definition for “watershed” and work with maps to determine watershed boundaries and their own “ecological address”.
- 3. Threats to Your Ecological Address ..... 71**  
 Using a class demonstration and a reading, students learn the difference between a healthy and unhealthy watershed, and then propose actions to repair damaged watersheds.
- 4. What Wiggles in Watershed Water? ..... 83**  
 Students study aquatic insects in a nearby stream to determine its general water quality.
- 5. Watershed Woes ..... 91**  
 Students create a model of water allocation for a growing town. Then, working at home with their family, students develop a water conservation plan.

### Unit 2: Salmon

- 1. The Long Wet Journey: The Cycle Begins ..... 103**  
 A story reading introduces a three lesson look at the life cycle of Pacific salmon. As a complement to the story, students measure water temperature.

- 2. The Long Wet Journey: Moving Downstream..... 125**  
The three lesson look at the salmon life cycle continues with a story reading recounting downstream migration. Students also manipulate a map to determine distance traveled.
- 3. The Long Wet Journey: Race to the Redd..... 143**  
The three lesson overview of the salmon life cycle concludes with a story reading focusing on upstream migration. As a summary, students play a migration simulation board game.
- 4. Hooks and Ladders..... 163**  
Students simulate the life cycle of Pacific Salmon and the hazards faced by salmon in a highly active game.
- 5. Investigating a Declining Resource: Salmon of the Columbia ..... 171**  
Students work in groups to discover and evaluate possible causes for decline of Columbia River Salmon populations, then report their findings to the class.
- 6. Columbia River Salmon: Legends and Stories of 23rd Century ... 189**  
Students develop legends, stories, and a “readers’ theatre” performance about how the Columbia River and its salmon are saved.

### Unit 3: Aquaculture

- 1. World In A Jar..... 197**  
Students set up and maintain a saltwater microcosm in a jar, as they try to maintain a stable and balanced habitat.
- 2. Farming the Sea ..... 215**  
Through a brief reading and discussion activity, students are introduced to the life cycles and rearing parameters involved with raising shellfish and finfish in a controlled environment.
- 3. Raising Salmon..... 225**  
Students read information and answer questions about three methods for raising salmon through aquaculture: hatchery released, sea ranching and sea farming.
- 4. Harvest Race ..... 249**  
Students role-play salmon trying to return to their rearing areas to spawn and avoid fishers along the way in this game of tag.
- 5. Food Web..... 255**  
Students make a physical model of food webs, food chains and pyramids to show the interrelationships of organisms, nutrients and energy in a marine ecosystem.

- 6. Seafood Festival ..... 277**  
Students evaluate the nutritional benefits of eating sea food as they create and publish their own recipe cookbook complete with fish tales!
- 7. Fish Farmer ..... 293**  
“Fish Farmer” is a board game in which players try to win by reaching the finfish first. A fun activity to reinforce aquaculture concepts.
- 8. Open for Business ..... 299**  
Students study the economic data about two seafood businesses and choose to own the more profitable based on their analysis and comparison of the two.

#### Unit 4: Finfish

- 1. Fish Gumbo ..... 307**  
Through reading and discussion, students begin a study of how fish are adapted to survive in a water environment.
- 2. Name That Fish ..... 317**  
Students read about “bottomfish”, cut out a paper one, and discover its name by using a dichotomous key.
- 3. Gyotaku ..... 327**  
Students make inferences about a live fish based on observations of its features. Then they read about the fish and make fish prints with it.
- 4. Fins ..... 339**  
Students compare, observe, and read about the physical features of the fins of two different fish species.
- 5. Ocean Address ..... 347**  
By way of introduction to some common and important fish and their habitats, students make a “mobile” of these fish.
- 6. The Fishing Business ..... 383**  
Students examine several different fishing methods and discuss how fishing can impact fish populations.
- 7. The Fish Are Running ..... 407**  
Students simulate international fishing problems as they play a kinesthetic game

**Unit 5: Finfish, Marine Mammals, and Humans**

- 1. The Tuna/Dolphin Controversy..... 419**  
Students read about the Tuna/Dolphin controversy and are challenged to write to businesses/lawmakers and to develop a method of fishing tuna.
- 2. Canned Tuna ..... 445**  
Students look for the label “dolphin safe” on cans of tuna and write letters either supporting a total ban on catching dolphins or letters which state that now the problem needs further study to assure the health of the ocean ecosystem.
- 3. Hear Sighted ..... 457**  
Students analyze data as they role-play dolphin features and echolocation.
- 4. Skedaddle to Seattle ..... 481**  
Students role-play special interest groups concerned with a proposal to allow killing some marine mammals, then present their cases and solutions at a hearing!