

MARINE SCIENCE: The World of Water

FOR SEA: Grades 9 to12 - Oceanography and Marine Biology

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Unit VI: Our Home: The Estuaries

- 1. The Boundary Bay Game** **1221**
 Students play roles in an interactive game which introduces the places we call estuaries and the water quality issues facing communities that have built on estuaries.
- 2. Estuary Currents** **1241**
 Students observe how fresh water and salt water behave when they meet and mix.
- 3. Barnacle Beats- Testing an Animal's Response to Variations in Salinity** **1251**
 Students perform one or more of the following four labs to learn how to measure and mix salt water samples. Then they measure cirri movements in barnacles immersed in waters of differing salinities.
- 4. How Salty Is the Water?.....** **1257**
 Students predict the salt content of sea water and then evaporate a sample to measure the remaining salt.
- 5. Making Test Tube Hydrometers** **1265**
 Students create hydrometers and use them to measure the salinity of water samples.
- 6. The Determination of Salinity- Hydrometer Method.....** **1277**
 Students use commercial hydrometers to measure the salinity of water samples.
- 7. The Determination of Salinity- Titration Method** **1291**
 Students use a titration techniques to measure the salinity of water samples.

- 8. Salinity..... 1303**
This reading describes the constituents of sea water and their sources.
- 9. The Effects of Salinity on Living Tissue (The Potato Lab) 1311**
Students measure the changes in potato cores soaked in fresh water and in salt water to see how salinity differences affect tissue.
- 10. Dealing With Salt 1325**
This reading and experiment compare weight changes in poor osmoregulators, such as sea stars, and effective osmoregulators, such as shore crabs, when exposed to waters of differing salinities.
- 11. Plankton I, II, III..... 1341**
This lab includes identification of plankton, the vital microorganisms of the estuary. It also includes several methods for quantifying plankton populations.
- 12. Name That Salmon..... 1379**
Students work in groups to identify the differences and similarities between seven species of salmon and trout that allow the fish to utilize estuarine habitats without competing with one another.
- 13. Pacific Salmon:
Species in the Spotlight and Salmon Cycles 1403**
This reading focuses on the salmon life cycle and ways in which human activities threaten salmon species as they utilize several habitats.
- 14. The Homing Salmon - Three Level Guide..... 1421**
This reading and three-level guide describe pioneering research exploring how salmon find their way back to their spawning stream.
- 15. Hooks and Ladders..... 1433**
This outdoor game models the salmon life cycle and its hazards.
- 16. Toothpick Fish 1439**
Toothpicks model salmon genes in this activity in which students explore how natural selection changes genetic diversity and how hatcheries alter salmon gene pools.
- 17. Native Americans: People of the Salmon 1461**
Students use a text to help research and present traditional northwest Native American ways of life with emphasis on ways the Native Americans were catching and using salmon before the 1800s.

- 18. Native Americans: Exploring Culture Through Mythology..... 1489**
Students read a northwest Native American myth and learn from it how values about salmon and how to preserve salmon runs are taught from one generation to the next.
- 19. Native Americans: Early Contact..... 1499**
Two student teams role play two very different fictional cultures meeting and attempting to trade items each group values. Students explore the dangers in misunderstanding unfamiliar cultures.
- 20. Native Americans: Who Gets to Fish?..... 1503**
Students analyze how the Boldt decision allocating fish in U.S. northwest waters has affected native and non-native fishermen.
- 21. Pollution in Paradise..... 1513**
This activity introduces contaminants commonly introduced into estuarine waters.
- 22. Water Quality Monitoring - Temperature..... 1523**
The following lessons teach students how to perform and interpret nine water quality tests and assemble them into an overall water quality index.
- 23. Water Quality Monitoring - Dissolved Oxygen..... 1527**
- 24. Water Quality Monitoring - B.O.D.-
Biochemical Oxygen Demand 1553**
- 25. Water Quality Monitoring - Nitrates and Phosphates 1569**
- 26. Water Quality Monitoring - pH 1581**
- 27. Water Quality Monitoring - Turbidity 1593**
- 28. Water Quality Monitoring - Total Solids 1601**
- 29. Water Quality Monitoring - Moving Up the Chain 1607**
Students examine how contaminants are concentrated in the food chain.
- 30. Water Quality Monitoring - Coliform Bacteria..... 1615**
- 31. Water Quality Monitoring - The Big Picture..... 1637**
Students interpret nine water quality tests and assemble them into an overall water quality index.
- 32. People and the Sea: Issues 1649**
Students identify issues facing marine habitats.
- 33. People and the Sea: Actions..... 1659**
Students plan and take action to address a selected issue facing marine habitats.