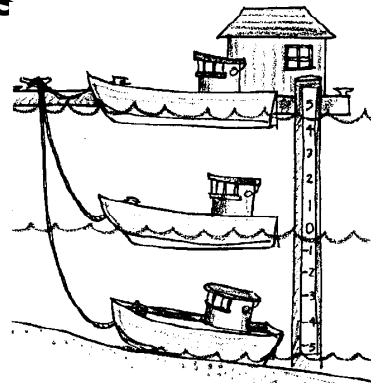


# MARINE SCIENCE: The World of Water

FOR SEA: Grades 9 to12 - Oceanography and Marine Biology

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### Unit III: Tides and the Rocky Shore

- 1. The Year of the Tides..... 715**  
 Each class constructs a giant, year long tide calendar and looks for patterns in the tides.
- 2. Using the 24 Hour Clock..... 725**  
 This lesson provides practice reading the 24 hour clock and adding and subtracting 24 hour clock times.
- 3. Types of Tides ..... 733**  
 Students read about and graph diurnal, semidiurnal and mixed tides.
- 4. Oceans in Motion: The Tides..... 759**  
 This reading provides explanations of some of the causes of the tides.
- 5. Barnacles: Still Hanging On ..... 777**  
 This three part lab, the first in a series of lessons about intertidal, rocky shore animals, explores barnacles' responses to temperature changes, their feeding behaviors and their life cycle stages.
- 6. Snails, limpets and chitons: Moving On ..... 795**  
 Students closely observe the movement of these mobile intertidal animals.
- 7. Sponges ..... 805**  
 Students take progressively more focused looks at sponge looking first at the whole animal, then at its body surface, and then at the composition of its body walls.

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- 8. One From Many ..... 819**  
This lab duplicates a classic experiment in which sponge cells are separated and their reaggregation observed.
- 9. Who’s Living Here? ..... 829**  
Students dissect a sponge and count and identify the commensal organisms in the animal.
- 10. Wharf Rat - Intertidal Zonation ..... 837**  
This field activity examines patterns and causes of zonation of intertidal marine organisms.
- 11. The Ecological Niche..... 851**  
Each student researches and describes the ecological niche of a selected marine organism.
- 12. Create a Rocky Shore..... 861**  
Student teams create a rocky shore scene, placing animals in their correct zones and adding interpretive notes.
- 13. The Black Tide..... 865**  
Students test a variety of materials to determine the best methods for cleaning up oil spills so they won’t harm the rocky shore.
- 14. Tanker Spill ..... 893**  
Students model an oil spill by dispersing popcorn. They then track the spread of the spill and analyze how wind and water conditions affect the severity of a spill.