OCEAN STUDIES, OCEAN ISSUES

FOR SEA: Marine Biology and Oceanography - Grade 8

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Unit I: Where Did All the Water Come From?

Unit 2: The Changing Shape of the Ocean Basins: The Theory of Plate Tectonics

- **7. Chemicals or Light Chemosynthesis/Photosynthesis 165** Simple chemical equations are used to compare photosynthesis and chemosynthesis as primary production processes.

Unit 3: The Changing Shape of the Ocean Basins: Ocean Floor Topography

- **5. Mountain Making Topographic Maps**......**239** Using a "mountain" of modeling clay, students cut off horizontal layers to create a topographic map of the mountain.

Unit 4: Ocean Waters in Motion: Currents

Students calculate the impact of wind driven currents on gray whale migration. A model of the interaction of water of different densities is set up and observed by students. Using a glass dish, water and food coloring, students observe the action of "wind" in current formation. Students construct and calibrate a hydrometer, then use it to determine the salinity of an unknown salt solution. Using their hydrometers, students measure and observe changes in the density of water as it is heated. Students measure the densities of solutions of varying salinities and relate their results to salinities in the ocean. A student reading with embedded questions explores the causes and effects of the changes in current patterns called El Nino. As they examine its importance in the ocean food web, students group and categorize common plankton. Using actual satellite images, students interpret and analyze remotely gathered data. Student teams create a mobile representing an ocean food web. Unit 5: Ocean Waters in Motion: Currents Affect Global Weather Illustrations and questions teach students the role energy from the sun plays in our atmosphere and climate. Students measure temperature changes in model greenhouses and relate their models to the Earth's atmosphere.

- **4. What Are the Scientists Saying About Global Climate Change? .. 431** This reading explores historical and prehistorical climate data and examines models of future climate change.

Unit 6: Issues of the Ocean Basins: Fishing Resources

- **1. A Case Study in the Salmon Dilemma: Sockeye Life History 511** Through reading and experimentation, students begin thinking about factors that affect salmon populations; the first of three activities focusing on salmon life cycles.
- 2. A Case Study in the Salmon Dilemma: To Be or Not to Be? 527 A mathematically oriented board game provides insight into variables affecting salmon populations.
- **3. A Case Study in the Salmon Dilemma: Who Pays the Price?...... 561** Students make policy decisions affecting salmon populations.

- - Students play a guessing game that introduces the concepts of Point and Non-Point Pollution.

Unit 8: Issues of the Ocean Basins: Offshore Oil Production

Students debate topics related to oil production and offshore drilling. Unit 9: Issues of the Ocean Basins: Mining the Ocean Floor 1. Mining the Ocean Floor731 A reading with embedded questions introduces students to ocean mining. Students investigate the affect of particle size on the rate of sedimentation. Unit 10: Issues of the Ocean Basins: Marine Sanctuaries In this introduction to clam anatomy and "lifestyle", students examine the parts of clams from a fish market. Given some of the characteristics of clam "lifestyle", students hypothesize on the impact of Asian Clams. Following background and history of the Marine Sanctuary Program, students plot the location of present sanctuaries. In this card game, students identify various facts about U.S. marine sanctuaries. Students become involved in the decision-making process used to select new sanctuaries from proposed sites. Unit 11: Issues of the Ocean Basins: Question: Can the Ocean Feed the World and Absorb our Wastes? Student groups review "important messages" about ocean environments, then decide on ways to those present messages.