

Introduction to Marine Science Seminar
LESSON PLAN FOR SALARY POINT
Middle School Curriculum, 8th Grade

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- OCEANOGRAPHY INTRO: LET’S CHANGE THE NAME OF THIS PLACE TO “PLANET OCEAN”
- OCEAN EXPLORATION: SUBS, SONAR, AND SCUBA; What’s down there anyway?
- ABIOTIC OCEAN PROPERTIES: SALINITY AND TEMPERATURE

Objectives:

1. To be able to describe/explain what is meant by oceanography.
2. To be able to identify the world’s oceans.
3. To be able to describe particular characteristics of the world’s oceans.
4. To demonstrate an understanding of the inter-connectedness of the world’s oceans.
5. To be able to describe the significant technologies used in ocean exploration – submersibles, sonar, scuba, sampling tools, satellite monitoring techniques.
6. To be able to explain the causes and variations of temperature and salinity in the world’s oceans.

State Standards addressed:

5a, 5b, 5d, 6c, 8a, 8c, 8d

LAUSD Standards addressed:

10, 14, 15, 16, 17

Lesson Concepts, discussion/lecture topics, summary:

- * About 71% of the earth is covered with salt water.
- * The world ocean is divided into three major oceans.
- * The Pacific Ocean is the largest and deepest.
- * The Atlantic Ocean is second in size, followed by the Indian Ocean.
- * A sea is connected to a major ocean, but is partly surrounded by land.
- * The composition of the ocean floor can be examined by collection samples of it by drilling into it, scraping sediment off the top of it, or grabbing chunks of it with mechanical arms or shovels.
- * A bathysphere is a “tethered” submersible.
- * A bathyscaph is a small research submarine.
- * Sea water contains dissolved salts and other minerals in a fairly uniform proportion, worldwide.
- * The salinity of the ocean differs slightly from place to place, due primarily to climatic conditions.
- * Salinity is the measure of dissolved SOLIDS in sea water, usually expressed in grams per kilogram, or parts per thousand by weight. Standard sea water has a salinity of 35o/oo.
- * Most of the world’s oceans can be vertically divided into three density/temperature zones: 1. surface or mixed layer; 2. thermocline; 3. deep ocean.

Representative Activities:

Project Wet:

1. Adventures in Density
2. Water Log
(personally created lab)
3. Making Sea Salt
 - weigh 100ml of sea water. (wt. of container + H₂O minus wt. of container)
 - evaporate all liquid (gentle boil)
 - weigh remaining precipitate (see above)
 - compare to known sea water salinity.

The Fluid Earth:

5. Density of cold liquid in bags compared with density of cold liquid in beakers. (FE 159, wkbk 37)
6. Graphing Pacific Ocean Temps at the equator. (FE 162, wkbk 39)
7. Making a Globe from an Orange. (FE 16)
8. How Much Water? (FE 8 , 9, 10 wkbk 3, 4, 5, 6)

Extensions/Homework:

(self created activity)

1. Take a Bath!
 - while in a comfortable bath, slowly add cold water from the tap.
 - where do you feel the cold water initially?
 - after 5 minutes where do you feel the cold water?
 - is there a difference in temperature between the surface water and the water at the bottom of the tub?
 - why?
 - what is the relationship of the water gradients in your tub, and cold water from the earth's polar regions flowing toward the equator?