

NEWPORT-MESA UNIFIED SCHOOL DISTRICT Course Description

MARINE SCIENCE 1AB

Content covered in this course is described in the Course of Study. Based upon student needs, teachers select appropriate materials from the Instructional Materials List. Classroom presentations of course content are determined by the instructor and described under Teacher Activities. A more detailed outline of this course can be obtained from the instructor.

Overview:

A one-year course for second-year science students designed to examine the physical aspects of the oceans. Students will study the physical and chemical properties of sea water, geological processes that formed the ocean basins, sea floor and shoreline features. Students will learn the origin of the solar system and its water, the effects of moon and tides, waves and wave properties. Introduction to the major groups of marine organisms and their interaction with the physical and chemical aspects of the ocean will be stressed.

Course of Study Objectives:

- 1. PERSPECTIVE OF OCEANS - HISTORICAL:** The student will demonstrate understanding of the historical perspective of the oceans.
 - 1.1 SUGGESTED STUDENT ACTIVITY:**
 - List historical contributors
 - List historical events
 - Identify oceans on a map
 - 1.2 INSTRUCTIONAL MATERIALS USED:**
 - District-adopted Textbook
 - Maps
 - Films
 - Videos
 - 1.3 TEACHER ACTIVITIES:**
 - Lecture
- 2. ORIGIN OF EARTH AND ITS OCEANS:** The student will explain the theories of the origin of the universe, planets and oceans.
 - 2.1 SUGGESTED STUDENT ACTIVITY:**
 - List steps of planetary origins from universe origin on down to finished planet
 - Physical characteristics of earth and ocean
 - 2.2 INSTRUCTIONAL MATERIALS USED:**
 - District-adopted textbook
 - Slides

- Videos
- Laserdisc

2.3 TEACHER ACTIVITIES:

- Lecture

3. PLATE TECTONICS AND OCEAN BASINS: The student will demonstrate understanding of the earth's crustal movement.**3.1 SUGGESTED STUDENT ACTIVITY:**

- Identify and label plate boundary features on maps.
- Delineate plates
- Profile ocean basin features

3.2 INSTRUCTIONAL MATERIALS USED:

- Maps
- Videos
- Films
- Laserdisc

3.3 TEACHER ACTIVITIES:

- Lecture
- Lab set-up

4. INTRODUCTION TO CHEMISTRY: The student will demonstrate understanding of basic concepts of chemistry.**4.1 SUGGESTED STUDENT ACTIVITY:**

- List structures of the atom
- Identify from periodic table, atomic number, masses and elemental symbol of some elements.
- Demonstrate examples of ionic and covalent bonding and balancing equations

4.2 INSTRUCTIONAL MATERIALS USED:

- Lab reagents
- District-adopted textbook
- Handouts

4.3 TEACHER ACTIVITIES:

Set up labs
Lecture demonstrations
Lecture

5. SEAWATER CHEMISTRY: The student will explain the factors that make up seawater.**5.1 SUGGESTED STUDENT ACTIVITY:**

- Students will be able to measure oxygen, carbon dioxide and salinity content
- Measure PH levels and relate all above factors to the environment of the ocean

5.2 INSTRUCTIONAL MATERIALS USED:

- Lab reagents
- Lab equipment

5.3 TEACHER ACTIVITIES:

- Demonstrations
- Lecture on techniques

6. CLIMATE AND OCEAN CIRCULATION: The student will describe and explain the forces creating climate and oceanic circulation.**6.1 SUGGESTED STUDENT ACTIVITY:**

- Students will plot global wind pattern
- Students will map the surface ocean currents
- Students will understand the effects of coriolis

6.2 INSTRUCTIONAL MATERIALS USED:

- Maps
- Video
- Laserdisc
- Video

6.3 TEACHER ACTIVITIES:

- Set up demonstrations
- Lectures

7. WAVES AND TIDES: The student will demonstrate understanding of the dynamics of waves and tides.**7.1 SUGGESTED STUDENT ACTIVITY:**

- Student will understand the aspects of waves: wave speed, wave period, and origin of waves
- Students will list the forces that generate tides
- Students will list the different tidal patterns and be able to graph tidal patterns

7.2 INSTRUCTIONAL MATERIALS USED:

- Film
- Video
- Graphs
- Tide Charts

7.3 TEACHER ACTIVITIES:

- Demonstrations
- Lecture

8. ECOLOGICAL ASPECTS: The student will describe and explain the basic ecological aspects of the oceans.**8.1 SUGGESTED STUDENT ACTIVITY:**

- Students will be able to diagram a food web/pyramid
- Students will express interrelationship of our environment and pollution

8.2 INSTRUCTIONAL MATERIALS USED:

- Video

8.3 TEACHER ACTIVITIES:

- Lecture
- Demonstrations

9. CLASSIFICATIONS - INTRODUCTION: The student will demonstrate understanding of why classifications are important in marine science.**9.1 SUGGESTED STUDENT ACTIVITY:**

- Students will show understanding of taxonomy
- Classification of plants and animals under the phylogenetic and ecological approaches

9.2 INSTRUCTIONAL MATERIALS USED:

- Labs
- Specimens

9.3 TEACHER ACTIVITIES:

- Lecture

10. CHARACTERISTICS OF THE OCEANIC PHYLA: Students will identify characteristics of a variety of marine organisms including plants, invertebrates and vertebrates.**10.1 SUGGESTED STUDENT ACTIVITY:**

- Labs of internal and external investigation
- Organism identification

10.2 INSTRUCTIONAL MATERIALS USED:

- Video material
- Latex gloves

10.3 TEACHER ACTIVITIES:

- Lecture
- Demonstrations

INSTRUCTIONAL MATERIALS:**TEXTBOOKS**

Oceanography, an Invitation to Marine Science, Tom Garrison Wadsworth, 1993
An Introduction to the World's Oceans, Duxbury, Duxbury, 2nd or 3rd Edition

SUPPLEMENTARY MATERIALS

National Geographic World Ocean Floor Map

Ward's Supple - Physiographic Maps

Chemistry Lab - Lab Equipment:

Balances

PH Testing Equipment

AgNO₃ for Salt Water Titration

Salonometer

Hyprometers

National Geographic Current Maps

Periodic Tables

Preserved Specimens: shark, fish, crayfish, clam, mussel, sea stars, urchins, squid

Microscopes - dissection and light

Dissection trays and equipment

Tide Tables

AUDIO-VISUAL MATERIALS**FILM****CATALOG #**

Adaptive Radiation

F-1553

And So Ends

F-2374

The Back Bay

F-1460

Beach—Rivers of Sand

F-1298

Birds & Penguins of Antarctic

Bondless Seas

F-2463 A&B

California Grey Whale

F-2486

Clouds Over Coral Reef

F-2130

Continents Adrift

F-1510

Coral Jungle

F-1319

Diffusion and Osmosis

F-1774

Echinoderms - Sea Stars

F-1560

Evidence for Atoms and Molecules

F-1037

Evolutionary Discovery

F-1413

Exploration of Mars

F-1971

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FILM

First Many-Celled Animals
Fish, Moons, Tides
Great Barrier Reef
Green Sea Turtle
How Level Is Sea Level ?
Jointed Legged Animals
Life Story of Oyster
Manta and Sting Rays
Marine Flowers
Marine Iguana of Galapagos
Molecular Motion
Moonwalk
Night of the Squid
Poisoned Sea
Return of Sea Elephants
Rocks That Form on the Surface
San Andreas Fault
Seals
Secrets of Underwater World
Sharks
Silent Forest
Simple Plants - Algae
Single-Celled Animals
Stinging-Celled Animals
The Solar System
This Land
Tragedy of Red Salmon
Unsinkable Otter
Volcano Surtsey
Water Birds
Water Planet
Waves On Water
Whales
What Is A Bird
What Is A Fish?
What Is A Reptile

CATALOG 3

F-1563
F-1336
F-2173 A&B
F-1321
F-1642
F-1570
F-1058
FL-232
F-2474
FI-369
F-1605
F-3036
F-1323
F-2357
F-1324
F-1146
F-1512
F-1325
F-1304
F-1326
F-1885
F-1577
F-1578
F-1579
F-2516
F-3027
F-1740
F-1739
F-2181
F-2080
F-1329
F-1301
F-1330
F-1583
F-1584
F-1586