Oceanography

Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet (book). No one can add or subtract from the Boy Scout Requirements #33215. Merit Badge Workbooks and much more are below: Online Resources.
Workbook developer: craig@craiglincoln.com. Requirements revised: 2003, Workbook updated: April 2008.

Scout's Name: _____ Unit: _____

Counselor's Name: _____ Counselor's Ph #: _____

1. Name four branches of oceanography.

_____

_____

_____

_____

Describe at least five reasons why it is important for people to learn about the oceans.

_____

_____

_____

_____

_____

_____

2. Define salinity, _____

_____

temperature, _____

_____

and density, _____

_____

and describe how these important properties of seawater are measured by the physical oceanographer.

_____

_____

_____

_____

Discuss the circulation and currents of the ocean. _____

_____

_____

_____

_____

Describe the effects of the oceans on weather and climate. _____

3. Describe the characteristics of ocean waves. _____

Point out the differences among the storm surge, _____

tsunami, _____

tidal wave, _____

and tidal bore. _____

Explain the difference between sea, _____

swell, _____

and surf. _____

Explain how breakers are formed. _____

4. Draw a cross-section of underwater topography. Show what is meant by:

(a) Continental shelf; _____

(b) Continental slope; _____

(c) Abyssal plain _____

Name and put on your drawing the following: seamount, guyot, rift valley, canyon, trench, and oceanic ridge. Compare the depths in the oceans with the heights of mountains on land. _____

5. List the main salts, _____

gases, _____

and nutrients in sea water. _____

Describe some important properties of water. _____

Tell how the animals and plants of the ocean affect the chemical composition of seawater. _____

Explain how differences in evaporation and precipitation affect the salt content of the oceans. _____

6. Describe some of the biologically important properties of seawater. _____

Define benthos, _____

nekton, _____

and plankton. _____

Name some of the plants and animals that make up each of these groups.

Benthos, _____

Nkton, _____

Plnkton. _____

Describe the place and importance of phytoplankton in the oceanic food chain. _____

7. Do ONE of the following:

☐ (a) Make a plankton net. * Tow the net by a dock, wade with it, hold it in a current, or tow it from a rowboat. Do this for about 20 minutes. Save the sample. Examine it under a microscope or high-power glass. Identify the three most common types of plankton in the sample. * May be done in lakes or streams.

☐ (b) Make a series of models (clay or plaster and wood) of a volcanic island. Show the growth of an atoll from a fringing reef through a barrier reef. Describe the Darwinian theory of coral reef formation.

☐ (c) Measure the water temperature at the surface, midwater, and bottom of a body of water four times daily for five consecutive days. You may measure depth with a rock tied to a line. Make a Secchi disk to measure turbidity (how much suspended sedimentation is in the water). Measure the air temperature. Note the cloud cover and roughness of the water. Show your findings (air and water temperature, turbidity) on a graph. Tell how the water temperature changes with air temperature.

☐ (d) Make a model showing the inshore sediment movement by littoral currents, tidal movement, and wave action. Include such formations as high and low waterlines, low-tide terrace, berm, and coastal cliffs. Show how offshore bars are built up and torn down.

☐ (e) Make a wave generator. Show reflection and refraction of waves. Show how groins, jetties, and breakwaters affect these patterns.

☐ (f) Track and monitor satellite images available on the Internet for a specific location for three weeks. Describe what you have learned to your counselor.

8) Do ONE of the following:

☐ (a) Write a 500-word report on a book about oceanography approved by your counselor.

☐ (b) Visit one of the following: (1) an oceanographic research ship or (2) an oceanographic institute. Write a 500-word report about your visit.

☐ (c) Explain to your troop in a five-minute prepared speech "Why Oceanography Is Important" or describe "Career Opportunities in Oceanography." (Before making your speech, show your speech outline to your counselor for approval.) *(Per National, "troop" means "unit".)*

9. Describe four methods that marine scientists use to investigate the ocean, underlying geology, and organisms living in the water.

Online Resources *(Use any Internet resource with caution and only with your parent's or guardian's permission.)*

Boy Scouts of America: ► scouting.org ► Guide to Safe Scouting ► Age-Appropriate Guidelines ► Safe Swim Defense ► Scout ► Tenderfoot ► Second Class ► First Class Rank Videos ► Safety Afloat

Boy Scout Merit Badge Workbooks: usscouts.org -or- meritbadge.org **Merit Badge Books:** www.scoutstuff.org

American Fisheries Society: http://www.fisheries.org
American Meteorological Society: http://www.ametsoc.org/AMS
American Zoo and Aquarium Association: http://www.aza.org
Discover Magazine: http://www.discover.com
The Discovery Channel: http://dsc.discovery.com/
The JASON Foundation for Education: http://www.jasonproject.org
Leave No Trace Center: http://www.LNT.org
Nat. Geographic Society: http://www.nationalgeographic.com
Nat. Park Service: http://www.nps.gov
Nat. Climatic Data Center: http://lwf.ncdc.noaa.gov/oa/ncdc.html
Nat. Oceanic and Atmospheric Admin: http://www.noaa.gov
The Ocean Alliance: http://www.oceanalliance.org
Scripps Institute of Oceanography: http://www.sio.ucsd.edu
Secrets of the Ocean Realm: http://www.pbs.org/oceanrealm
The Tide Pool Page: http://web.mit.edu/corrina/tpool/tidepool.html
U.S. Fish and Wildlife Service: http://www.fws.gov