Oceanography Merit Badge
Huntley Meadows Park

Please bring to class:

- **Pre-Work – listed in BOLD and red**
- Blue card
- Pen
- Snack/lunch and a drink
- Appropriate clothing to go outside to observe the weather

Important information about how to prepare for a merit badge program at Huntley Meadows Park.

Parents, please review the content of a merit badge prior to registering your scout: some badges may be challenging for younger scouts. Also, the class discussions are more interesting if scouts review *all* the requirements for the badge before the program. The chances of your scout completing all the work for the badge increases dramatically when he is properly motivated and the badge content is age-appropriate.

Merit badges are not designed to be completed in a day and require independent work on the part of the scout outside of the workshop. We call this PREWORK. We suggest this is done prior to the badge program date, but we realize this is not always practical or possible, in these cases we will sign partial cards and accept the assignments after the program.

Merit badge programs can be from 3 to 5 hours long, so be sure to pack a snack and water for your scout and that he is dressed appropriately for being outdoors for some or all of the program.

Though not required, Scout workbooks are very useful and we prefer that scouts use the workbook during the program. Workbooks can be found at:
http://meritbadge.org/wiki/index.php/Merit_Badge_Worksheets .

About blue cards: WE DO NOT HAVE BLUE CARDS. Please bring an *authorized* blue card with you to the program. Your troop scout master should be consulted prior to attending any merit badge program and he or she will sign the front of the card.

1. IN CLASS Name four branches of oceanography. Describe at least five reasons why it is important for people to learn about the oceans.
2. IN CLASS 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. IN CLASS 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. IN CLASS Draw a cross-section of underwater topography. Show what is meant by:

   (a) Continental shelf,

   (b) Continental slope; and

   (c)Abyssal plain.

5. IN CLASS 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. IN CLASS 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. Describe the place and importance of phytoplankton in the oceanic food chain.
7. **PREWORK 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. **PREWORK 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, marine laboratory, or marine aquarium. 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.)**

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

Huntley Meadows Park
Fairfax County Park Authority
Melodie Stehling
melodie.stehling@fairfaxcounty.gov
Phone: 703-768-2525