

## Oceanography Merit Badge Pre-Work

- Oceanography is a four-hour session.
- Scouts are required to wear masks and follow social distancing recommendations both in the classroom and outside.
- Scouts must submit prework to their counselor by email ahead of the merit badge session. Counselors will not collect physical copies of prework during the class. Please note that we are unable to open Google Docs on Fairfax County Government computers. Prework requirements must be sent as an attachment.
- Counselors will provide Blue Cards that have been signed and completed before the merit badge session.
- Water fountains will not be available
- Scouts should bring a snack and plenty of water. Please no red liquids.
- Parts of the session take place outdoors. Please wear sunscreen, insect repellent and appropriate shoes.

### Pre-work

1. Name four branches of oceanography. Describe at least five reasons why it is important for people to learn about the oceans.

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.

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 the 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. Oceanographic research ship

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

For help or questions, contact Emily Cole at [Emily.cole@fairfaxcounty.gov](mailto:Emily.cole@fairfaxcounty.gov), or at (703) 941-1065.