Oceanography Merit Badge at Lake Fairfax Park

Welcome to the Oceanography Merit Badge Program at Lake Fairfax Park. The exact meeting location for the class is at the Lake Fairfax Park Main Office. Lake Fairfax Park is located at:

1400 Lake Fairfax Drive

Reston, VA 20190.

Scouts should be dressed appropriately for the weather. Be Prepared!

Important Merit Badge information for parents:

- Please be familiar with the requirements of the program your scout has selected. Some badges take considerable time and planning to complete. Some badges may not be appropriate for younger scouts.
- Blue cards must be signed by the troop leader before attending the merit badge program. Lake Fairfax Park does not have blue cards.
- This badge program is a single 4-hour class. Every badge requires some independent work by your scout. All requirements, including prework, the program, and postwork, must be completed before park staff can sign the merit badge card. Note: Not all badges will have postwork.
- Please be prepared for the possibility that you may have to stay for the program and not just drop off your scout. We encourage that one or more adults remain. There is no fee for adults, and you are sure to learn something. This will allow the instructor to concentrate more fully on the difficult task of imparting all the required information and assisting the boys individually if necessary. Additionally, adults may help keep the atmosphere calm and productive. It is also in keeping with the scouting guidelines for youth protection.
- ARRIVE ON TIME – EARLY IS BETTER! PLAN TO ARRIVE 5 MINUTES EARLY. IF SCOUTS ARE LATE, THEY MAY NOT COMPLETE THE BADGE.

What to bring to the program:

- Bring your completed homework. It is OK if you cannot complete the homework before class. You can bring the completed homework in at a later date for sign-off and will receive partial credit till the rest is completed.
- Come prepared to discuss and present your homework. As we move from one topic to the next during class scouts will be asked to present homework elements completed. It will be more important to prove that you have understood a requirement orally rather than just presenting written information.
- Bring your blue card signed by your scout master. (Lake Fairfax Park does not have blue cards.)
- Bring/wear weather appropriate clothing/outerwear. We will not go outdoors in heavy rain or thunderstorms. Boy Scout uniform is not required.
- Bring a pencil and pen.
- Bring a snack/ lunch and water bottle.

TO DO AT HOME as PREWORK prior to class:

- Read the Oceanography Merit Badge booklet!!!

Do Requirement 1.

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

Do Requirement 4.

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.

Do Requirement 5.

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.

Do Requirement 6.

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

Do Requirement 7.

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.

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.

Do Requirement 8

8. Do **ONE** of the following:

a. Write a 500-word report on a book about oceanography approved by your counselor (the book can be about any oceans topic from deep sea exploration, marine mammals, coastal processes, commercial fishing, etc.)

b. Visit **one** of the following:

1) Oceanographic research ship

2) Oceanographic institute (the Oceans Hall at the Smithsonian or a large aquarium like the Baltimore Aquarium counts here)

Write a 500-word report (or more) 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.)

Requirements to be demonstrated, practiced and assessed during the class:

We will be reviewing recommended homework to ensure a thorough understanding and will also be covering the following requirements during the class:

Requirement 2.

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.

Requirement 3.

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.

Requirement 9.

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

Work completed after the program:

Once the prework, class work and postwork are completed, all elements of the merit badge will be complete. If your scout needs blue card sign-off after the class date, please call (703) 246-5931 to arrange a time to meet with a merit badge counselor.

We're looking forward to working with your scout!

Lake Fairfax Park

(703) 246-5931

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Reston, VA 20190

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https://www.fairfaxcounty.gov/parks/lake-fairfax/scouts