



Lake Fairfax Park Environmental Science Merit Badge

Welcome to the Environmental Science Merit Badge program at Lake Fairfax Park. This program is held at the Lake Fairfax Park Main Office located at 1400 Lake Fairfax Drive in Reston unless otherwise indicated by park staff.

Important general 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.
- Most merit badges are not designed to be completed in a single session. Every badge requires some independent work by your scout. All requirements, including pre-work, the program, and post work, must be completed before park staff can sign the merit badge card. Note: Not all badges will have post work.
- 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.

Below is the recommended homework to be completed before the program:

Please download the merit badge worksheets from meritbadge.org and bring these worksheets to class. These worksheets help scouts organize their homework and classwork. We will go over all of the merit badge requirements during class but it is helpful if the scout has reviewed the worksheet ahead of time.

- 1) Make a time line of the history of environmental science in America. Identify the contribution made by the Boy Scouts of America to environmental science. Include dates, names of people or organizations, and important events.
- 2) Define the following terms: population, community, ecosystem, biosphere, symbiosis, niche, habitat, conservation, threatened species, endangered species, extinction, pollution prevention, brownfield, ozone, watershed, air shed, nonpoint source, hybrid vehicle, fuel cell.
- 3) Do ONE activity from EACH of the following categories (using the activities in this pamphlet as the basis for planning and projects):

- a. Ecology
 - 1. Conduct an experiment to find out how living things respond to changes in their environments. Discuss your observations with your counselor.
 - 2. Conduct an experiment illustrating the greenhouse effect. Keep a journal of your data and observations. Discuss your conclusions with your counselor.
 - 3. Discuss what an ecosystem is. Tell how it is maintained in nature and how it survives.
- b. Air Pollution
 - 1. Perform an experiment to test for particulates that contribute to air pollution. Discuss your findings with your counselor.
 - 2. Record the trips taken, mileage, and fuel consumption of a family car for seven days, and calculate how many miles per gallon the car gets. Determine whether any trips could have been combined ("chained") rather than taken out and back. Using the idea of trip chaining, determine how many miles and gallons of gas could have been saved in those seven days.
 - 3. Explain what acid rain is. In your explanation, tell how it affects plants and the environment and the steps society can take to help reduce its effects.
- c. Water Pollution
 - 1. Conduct an experiment to show how living things react to thermal pollution. Discuss your observations with your counselor.
 - 2. Conduct an experiment to identify the methods that could be used to mediate (reduce) the effects of an oil spill on waterfowl. Discuss your results with your counselor.
 - 3. Describe the impact of a waterborne pollutant on an aquatic community. Write a 100-word report on how that pollutant affected aquatic life, what the effect was, and whether the effect is linked to bio-magnification.
- d. Land Pollution
 - 1. Conduct an experiment to illustrate soil erosion by water. Take photographs or make a drawing of the soil before and after your experiment, and make a poster showing your results. Present your poster to your counselor.
 - 2. Perform an experiment to determine the effect of an oil spill on land. Discuss your conclusions with your counselor.
 - 3. Photograph an area affected by erosion. Share your photographs with your counselor and discuss why the area has eroded and what might be done to help alleviate the erosion.
- e. Endangered Species
 - 1. Do research on one endangered species found in your state. Find out what its natural habitat is, why it is endangered, what is being done to preserve it, and how many individual organisms are left in the wild. Prepare a 100-word report about the organism, including a drawing. Present your report to your patrol or troop.
 - 2. Do research on one species that was endangered or threatened but which has now recovered. Find out how the organism recovered, and what its new status is. Write a 100-word report on the species and discuss it with your counselor.
 - 3. With your parent's and counselor's approval, work with a natural resource professional to identify two projects that have been approved to improve the habitat for a threatened or endangered species in your area. Visit the site of one of these projects and report on what you saw.
- f. Pollution Prevention, Resource Recovery, and Conservation
 - 1. Look around your home and determine 10 ways your family can help reduce pollution. Practice at least two of these methods for seven days and discuss with your counselor what you have learned.
 - 2. Determine 10 ways to conserve resources or use resources more efficiently in your home, at school, or at camp. Practice at least two of these

methods for seven days and discuss with your counselor what you have learned.

What to bring to the program:

- Bring your completed homework. It is OK if you cannot complete the homework before class. You can bring completed homework in at a later date for sign-off.
- 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.
- Bring a tent, if you have one.
- Bring your blue card. (Lake Fairfax does not have blue cards.)
- Bring/wear weather appropriate clothing/outerwear. We will not go outdoors in heavy rain or thunderstorms. Boy Scout uniform not required.
- Bring a pencil and pen.
- Download the merit badge worksheets from meritbadge.com and bring these worksheets to class.
- Bring a snack and drink. Bring more substantial food if your program is longer than four hours.

Work completed after the program:

During the program, the merit badge counselor will do a demonstration or explain the process for completing the final merit badge requirements. Your scout must provide evidence of completion in order to obtain blue card sign-off. Digital photographs of your scout doing the element and a picture of the completed requirement will be sufficient evidence, unless otherwise stated.

If your scout needs blue card sign-off after the class date, please call 703-471-5414 to arrange a time to meet with a merit badge counselor.

We're looking forward to working with your scout.

Lake Fairfax Park
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www.fairfaxcounty.gov/parks/lakefairfax