

## Discovery Place Nature

Formerly, Charlotte Nature Museum, a division of Discovery Place  
1658 Sterling Rd, Charlotte, NC 28209

### Environmental Science Merit Badge Workshops 2019

<https://nature.discoveryplace.org/programs-and-classes/scout-programs>

All Merit Badges are scheduled for 9:00 am to 4:00 pm and will meet in the Naturalist Lab at Discovery Place Nature.

Cost: \$15/participant

| <b><u>Date and Time</u></b>               | <b><u>Merit Badge Workshop</u></b> |
|---|------------------------------------|
| Saturday, February 23, 9:00 am to 4:00 pm | Environmental Science              |
| Saturday, April 6, 9:00 am to 4:00 pm     | Environmental Science              |
| Saturday, June 1, 9:00 am to 4:00 pm      | Environmental Science              |

Merit Badge workshops offer opportunity for completions ***IF*** Scouts complete pre-course homework and present the homework to the Merit Badge Counselor when the course meets.

All workshops take place at Discovery Place Nature (formerly the Charlotte Nature Museum, a division of Discovery Place) at 1658 Sterling Road, Charlotte, NC 28209

To reserve a workshop spot, please contact Guest Sales and Reservations at 704 372 6291 at extension 300.



## Discovery Place Nature Environmental Science Merit Badge Workshops 2019

Saturday, February 23, 9:00 am to 4:00 pm

Saturday, April 6, 9:00 am to 4:00 pm

Saturday, June 1, 9:00 am to 4:00 pm

**Website:** <https://nature.discoveryplace.org/programs-and-classes/scout-programs>

**Location of event:** Discovery Place Nature (formerly, Charlotte Nature Museum, a division of Discovery Place), 1658 Sterling Rd, Charlotte, NC 28209, Phone 704 372 6261

**Minimum class size:** 5

**Maximum class size:** 20

**Cost:** Cost is \$15 for one class.

**Refunds:** Discovery Place Nature is not able to offer a refund if a Scout is not able to attend. However, if a Scout is not able to attend, he may notify Discovery Place Science of their situation and either recruit a Scout to take their place or ask Discovery Place Science to apply their paid fee toward their registration for a future merit badge program.

**Method of registration:** Please call Discovery Place Nature through the Discovery Place Science registration number at 704 372 6261 ext. 300 to register. Scouts must register in advance to participate.

**Registration opens:** Wednesday, January 2, 2019

**Registration closes:** When class is full.

**Age requirement:** None. All Scouts 11 through 17 may participate.

**Rank requirement:** None. All Scouts 11 through 17 may participate.

**Blue card requirement:** Each Scout must present to the counselor a separate blue card signed by their Scoutmaster indicating permission to participate in the course(s). Scouts should fill out the requirement grid portion of the card and have the Merit Badge Counselor initial this section of the card for each completed requirement and indicate

**incomplete requirements. When the Scout has completed all requirements, a Merit Badge Counselor, either with Discovery Place Nature or with their home troop, must sign and date the card on 2 places. Each Scout is responsible to obtain these signatures and to turn the card in to their Scoutmaster so that merit badge can be registered and awarded.**

Parents are welcome to attend all sessions.

**Partial or Full Completion:** Full completion of any of these merit badges is possible IF Scouts complete above preparations before class. If a Scout does not finish all requirements, he can work with their counselor to list and initial requirements completed on their blue card for later completion with the counselor. Scouts should follow the buddy system with 2-deep adult leadership for all merit badge sessions and for all meetings with Counselors.

**Food:** Scouts should pack their own lunches and can eat them on the back deck of the Discovery Place Nature facility. There is no place to purchase food at the Discovery Place Nature facility. Eating or drinking during the class sessions will not be allowed. Please bring a reusable water bottle and a small daypack since part of the day will be outside.

**Clothing:** Scouts are expected to wear their field uniform ("Class A" uniform) with Scout pants and shirt to demonstrate participation as a Scout and to reinforce Scouting values and behavior during the course. Scouts must wear closed-toe shoes or boots (not sandals) with socks to classes for safety. Scouts should wear clothing that is appropriate for outdoor weather. Scouts should wear sun block and a hat. **Scouts will be outside for part of each class.** Neckerchiefs and merit badge sashes and medals are not expected or required.

**Cell phones:** Scouts may have cell phones with them during the course, but cell phones should be turned completely off during all class sessions. If a Scout chooses to send or receive even a single text message or talk on their cell phone during class, they will be expected to loan their cell phone to the instructor or to a parent or to a Scout leader for safe keeping during the rest of the day, to be returned when the class ends.

### **Preparation for All Merit Badges before class:**

1. Scouts must read the merit badge book before class.
2. Scouts may print Merit Badge requirements from <http://www.scouting.org/meritbadges.aspx> or from [http://www.meritbadge.org/wiki/index.php/Merit\\_Badge\\_Worksheets](http://www.meritbadge.org/wiki/index.php/Merit_Badge_Worksheets)  
Scouts find that workbooks from the [www.meritbadge.org](http://www.meritbadge.org) site can be very helpful in organizing their work but these printouts are not required.
3. Scouts must bring blank paper and pen to the course for their notes and research.
4. All Scouts are expected to bring pre-course homework assignments with them to class and present these notes and projects to the merit badge counselor as evidence of your preparation.

### **Preparation for All Merit Badges during class:**

All Scouts are expected to take notes and to write down answers to requirement questions as the information is presented during the course. These notes should be available at the end of the day to show the Merit Badge Counselor on-site and to demonstrate your participation and learning to your Scoutmaster and other troop leaders. Scouts should keep these notes to avoid any concerns about the level of participation or accomplishment at Boards of Review or Scoutmaster Conferences.

### **Check in and participation procedures:**

As Scouts check in on arrival to Discovery Place Nature, a record of their presentation will be recorded, including

1. Punctuality
2. Uniform
3. Appropriate shoes and socks
4. Pre-course homework
5. Pen and paper
6. Water
7. Packed lunch

During their classroom and outdoor course work, a record of their participation will be recorded, including

8. Cell phone use
9. Talking and horseplay

A report of his presentation and participation will be emailed to the Scout, his parent(s), and Scoutmaster.



## Environmental Science Merit Badge Requirements

1. Make a timeline 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, airshed, 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 is an ecosystem. 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 is acid rain. 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 biomagnification.

#### 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.
- (3) Perform an experiment on packaging materials to find out which ones are biodegradable. Discuss your conclusion with your counselor.

#### G. Pollination

- (1) Using photographs or illustrations, point out the differences between a drone and a worker bee. Discuss the stages of bee development (eggs, larvae, pupae). Explain the pollination process, and what propolis is and how it is used by honey bees. Tell how bees make honey and beeswax, and how both are harvested. Explain the part played in the life of the hive by the queen, the drones, and the workers.
- (2) Present to your counselor a one-page report on how and why honey bees are used in pollinating food crops. In your report, discuss the problems faced by the bee population today, and the impact to humanity if there were no pollinators. Share your report with your troop or patrol, your class at school, or another group approved by your counselor.

(3) Hive a swarm OR divide at least one colony of honey bees. Explain how a hive is constructed.

Before you choose requirement 3G(3), you will need to first find out whether you are allergic to bee stings. Visit an allergist or your family physician to find out. If you are allergic to bee stings, you should choose another option within requirement 3. In completing requirement 3G(3), your counselor can help you find an established beekeeper to meet with you and your buddy. Ask whether you can help hive a swarm or divide a colony of honey bees. Before your visit, be sure your buddy is not allergic to bee stings. For help with locating a beekeeper in your state, visit [www.beeculture.com](http://www.beeculture.com) and click on "Bee Resources," then "Find a Local Beekeeper."

4. Choose two outdoor study areas that are very different from one another (e.g., hilltop vs. bottom of a hill; field vs. forest; swamp vs. dry land). For BOTH study areas, do ONE of the following:

A. Mark off a plot of 4 square yards in each study area, and count the number of species found there. Estimate how much space is occupied by each plant species and the type and number of nonplant species you find. Write a report that adequately discusses the biodiversity and population density of these study areas. Discuss your report with your counselor.

B. Make at least three visits to each of the two study areas (for a total of six visits), staying for at least 20 minutes each time, to observe the living and nonliving parts of the ecosystem. Space each visit far enough apart that there are readily apparent differences in the observations. Keep a journal that includes the differences you observe. Then, write a short report that adequately addresses your observations, including how the differences of the study areas might relate to the differences noted, and discuss this with your counselor.

5. Using the construction project provided or a plan you create on your own, identify the items that would need to be included in an environmental impact statement for the project planned.

6. Find out about three career opportunities in environmental science. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

## Environmental Science Merit Badge Homework

Scouts must bring all written homework to class to receive credit.

### Before class:

1. Scouts must Be Prepared by completing **requirement 2** at home and by bringing written results with them to class. This workbook contains the terms: [https://meritbadge.org/wiki/images/3/3a/Environmental\\_Science.pdf](https://meritbadge.org/wiki/images/3/3a/Environmental_Science.pdf)
2. Scouts must Be Prepared by completing **requirements 3d and 3e** before class and must bring their completed work to class. Here is some information on endangered animals in North Carolina: [http://www.fws.gov/raleigh/es\\_tes.html](http://www.fws.gov/raleigh/es_tes.html)
3. Scouts must Be Prepared by completing **requirement 3f** at home and must bring their completed work to class. Here is some information on reducing pollution at home: [http://epa.gov/oagps001/peg\\_caa/reduce.html](http://epa.gov/oagps001/peg_caa/reduce.html)
4. Scouts must Be Prepared by completing **requirement 6** at home and must bring their completed work to class. Here is some information on career opportunities in environmental science: <http://www.collegexpress.com/interests/science-and-engineering/articles/studying-sciences/environmental-science-majors-and-potential-careers/>

### During class:

1. Scouts will cover requirements: 1, 3a1, 3b3, 3c2, 4a, and 5