

Wetlands Institute Programs for Boy Scouts



Thank you for considering the Wetlands Institute in helping you receive your Scout Badge!

Listed below are the scout merit badges we can help you obtain. Each badge below is an overview of activities scouts participate in to obtain a badge. **Keep in mind, the staff at the Wetlands Institute does not have the resources to perform *all* activities which are required to receive certain badges. These badges are marked with an asterisk***

What to bring and how to prepare

*All activities involve some time outside, unless weather is severe. Please be prepared for the weather

1. Wearing old clothes is best and don't forget jackets, hats, etc. Sun block is highly recommended, bug spray is optional.
2. Foot protection is essential, especially in areas with water due to jagged shells and rocks. Most water shoes are not adequate protection and flip-flops do not stay on feet in the water or mud. Sports sandals (waterproof sandals with straps) work effectively. Old submersible sneakers work as well. Occasionally shoes are lost in the marsh mud! Please do not send your child in expensive shoes.
6. If troop is obtaining the badge on the grounds of the Institute, boys bring a bagged lunch. Programs are usually 2-3 hours long. If it is a long program, we'll provide the troop a half hour lunch break.

PLEASE NOTE: Ticks are an ongoing problem anywhere in New Jersey and can be found almost anywhere out-of-doors. We will make every effort to minimize this danger, however there can be no guarantee that a child will not pick up a tick. Checking for ticks should be an ongoing daily routine when children have been outside. Authorities believe that ticks need 24 hours to imbed before they can convey Lyme disease. Checking carefully each night can avoid this problem. Please let me know if you would like more information about ticks and tick-borne illness.

Non-badge educational programs are also available for Scouts. Please check out our website at <http://wetlandsinstitute.org/education/field-trips/> for details.

Oceanography

Requirements Performed by the Institute

Part of the lesson takes place at beach or the Institute's floating dock



1. The group is introduced to oceanography and its five branches. We discuss each branch in depth and why it is important for each to be studied
 - a. Physical – temperature, salinity, wave formation, etc
 - b. Geological- ocean topography and tectonic plates
 - c. Meteorological – weather patterns, hurricanes, tropical storms
 - d. Chemical - ocean chemicals, hydrothermal vents
 - e. Biological - plants, animals, and other life forms and how they interact with their surrounding environment (ecology)
2. Scientists of the NJ coast. New Jersey coastal conservation issues such as sand erosion, barrier beach development, and what you need to know about New Jersey SHARKS!
3. Scouts draw out a cross section of the ocean's topography and label the appropriate parts. (this activity is not done for Morey's Piers Scout Jam)
4. Walk down trail to boat house or trip to the beach
 - a. Scouts will learn terms such as temperature, salinity, density, and perform demonstrations of each.
 - b. Temperature test, using thermometer in degrees Fahrenheit
 - c. Salinity test, with a refractometer and hydrometer in units part per thousand
 - d. Density- floating egg test along with other objects. We also briefly discuss water displacement
5. Plankton
 - a. Discuss the ecological role of plankton in the ocean and how its important to the organisms in the ocean and on land
 - b. Show plankton net. Off the dock, scouts take turns in trying to obtain a concentrated sample of plankton in salt water.
 - c. How to make your own plankton net from house hold items.
6. Conclusion
 - a. We discuss what we've learned and the valuable resources that the ocean gives us such as food, water, oxygen, and so much more

Bird Study

Requirements Performed by the Institute

1. Give a brief introduction to New Jersey Wetlands and what birds we might expect to see
2. The class will discuss the need for bird study and why birds are useful indicators of the quality of the environment.
3. Discussion on avian anatomy and adaptations, labeling parts of the bird and bird wing
4. Explain how to properly use and care for a pair of binoculars.
5. Scouts will be given a tour down our marsh trail while practicing how to use binoculars and a bird field guide. Any birds observed in the field will be recorded in a field notebook, making a separate entry for each species. The following information is to be recorded from your field observations and other references:
 - a. Note the date and time.
 - b. Note the location and habitat.
 - c. Describe the bird's main feeding habitat and list two types of food that the bird is likely to eat.
 - d. Note whether the bird is a migrant or a summer, winter, or year-round resident of your area.
6. The group will stop, listen, and identify a bird(s) by song or call alone. For each species, enter a description of the song or call. If you can see the bird, note its behavior. Why do you think that bird was making the call or song that you heard.
7. Make your own bird feeder



Bird Study
BSA Supply No. 35865

Environmental Science

Requirements Performed by the Institute

Pre-visit activity. Make a time line of the history of environmental science in America and the contribution Boy Scouts have made. Time line does not need to be brought to the Wetlands Institute.



1. What is involved in Environmental Science? Counselor and scouts will discuss 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.
 - a. Ecology
 1. Discussion of what is an ecosystem, with particular focus on the salt marsh wetlands.
 2. Tell how it is maintained in nature and how it survives.
 - b. Air Pollution
 1. Explain what is acid rain. In your explanation, tell how it affects plants, the environment, and the steps society can take to help reduce its effects.
 - c. Water Pollution
 1. Perform water testing on floating dock, discussing results and then emphasizing the importance of testing water for pollutants.
 2. Explain the importance of watersheds
 3. Perform a bird feather/oil experiment to show the effects of an oil spill on waterfowl. Discuss your results with your counselor.
 - d. Land Pollution
 1. Conduct a test on salt marsh soil. Discuss the sponge-like qualities of the salt marsh and how it minimizes pollutants from land going into the ocean.
 2. What is soil erosion? Conduct an experiment to illustrate soil erosion by water. Show examples of soil erosion on the coast and why it's a big problem in New Jersey.
 - e. Endangered Species
 1. Scouts receive a tour of our Wetlands Institute laboratory to see the work being done to help protect the Northern Diamondback Terrapin as well as horseshoe crabs and shore bird.
 - f. Pollution Prevention, Resource Recovery, and Conservation
 1. Discuss and record 10 ways you can reduce your waste/ carbon footprint to help the environment. Scouts try these techniques at home.
 - g. Mark off a 4 square yard plot and count the number of species found there. Estimate how much space is occupied by each plant species as well as the type and number of non-plant species you find. Write a report that adequately discusses the biodiversity and population density of these study areas. Discuss your report with your counselor.

Soil and Water Conservation*

Requirements performed by the Institute

1. Scouts will start off by learning what soil is, how it's formed, different kinds of soil, and what nutrients are in soil that plants need.
2. We will discuss the following:
 - a. Soil erosion and conservation
 - b. Tell what is meant by conservation practices.
 - c. Describe the effect of three kinds of erosion-control practices.
3. Watersheds:
 - a. What do you think of when you hear "water pollution"?
What are some examples of water pollution?
Industrialization's effects on soil and water.
 - b. Understand watersheds and river basins and their importance. We will also discuss negative effects on water sheds such as land pollution, and deforestation. Scouts then are able to create and demonstrate the mechanics of a water shed
4. The Water Cycle
 - a. Scouts will participate in a game demonstrating the water cycle, and how pollution can become a factor.
5. Trip to the beach
 - a. Scouts will perform water testing practices and discuss how scientists would test for pollutants
 - b. Discuss the issue of coastal jetties and beach erosion in New Jersey
 - c. Beach combing for pollution- how plastic and other hazardous materials in the water and on land have an impact on wildlife. Discuss current day pollution issues



Soil and Water Conservation
BSA Supply No. 35952

Plant Science *

Requirements Performed at the Institute

(On their own time, scouts can grow their own plant and bring it to the Wetlands)



1. A brief introduction to the Wetlands ecosystem and what plants we may encounter on our trail walk.
2. Why are most plants green? Why do plants have flowers? Fruit? Leaves? All of the questions will be answered today to get a better understanding of the natural world around you.
3. Scouts will make a drawing and identify five or more parts of a flowering plant. We will discuss what each part does.
4. We will discuss photosynthesis, its importance, and name at least five ways that humans depend on plants.
5. Scouts will talk with their counselor on how water, light, air, temperature, pollinators, and pests affect plants. Describe the nature and function of soil and explain its importance. Talk about the texture, structure, and composition of fertile soil. Tell how soil may be improved.
6. Field Botany Trail Walk
 - a. We look for which species of plants are the largest, most abundant, invasive, native, poisonous, edible, etc.
7. Field Guides
 - a. Scouts will also practice learning how to use a plant field guide to properly identify the local plant life.
8. Plant Presses
 - a. On our way back, scouts will be allowed to pick certain approved vegetation for pressing. We will learn proper techniques for plant pressing which the scouts will be able to take home with them.

Fish and Wildlife Management*

Requirements Performed at the Wetlands Institute

1. A brief introduction to the Wetlands Institute and the wildlife we may encounter on our trail walk.
2. Describe the meaning and purposes of fish and wildlife conservation and management.
3. List and discuss at least three major problems that continue to threaten New Jersey fish and wildlife resources.
4. Describe some practical ways in which everyone can help with the fish and wildlife conservation effort.
5. List and describe five major fish and wildlife management practices used by managers in your state.
6. Owl pellet dissection:
 - a. Wildlife managers can determine the health of an ecosystem based on what animals are and aren't eating. One way to determine healthy populations of predators and prey in some areas is to look for owl pellets.
 - b. Each scout will receive an owl pellet to dissect, mount, and take home. Scouts must successfully identify the species they dissected and then piece the skeleton together onto a diagram with glue.
7. Trail walk/observation tower:
 - a. While visiting our observation tower and taking a trip along our trail walk, scouts must observe and record 25 species of wildlife. Your list may include mammals, birds, reptiles, amphibians, and fish. Most wildlife seen at the Wetlands Institute includes birds and invertebrates.
 - b. At the end of our trail walk, scouts will participate in seine netting. Seine nets allow us to catch fish, invertebrates, etc. This gives scouts an idea for what kinds of critters live in the waters of the salt marsh and how they play a vital role in the ecosystem.
8. Make a bird feeder:
 - a. Scouts bring a used milk jug to make a bird feeder to take home. They then are encouraged to watch it each day and take note of the different species of birds that visit it.



Fish and Wildlife Management
BSA Supply No. 35898

Nature

Requirements

1. A brief introduction to the salt marsh wetlands ecosystem.
2. We will discuss why plants are important to animals and vice versa. Also there will be a discussion on local plants and animals, which are endangered and why.
3. Scouts will understand the concept of a "food chain" as well as a "food web" with a game called "Cycles of Life"
4. We will venture out for a marsh trail walk to our boat house. On the way we will perform the following activities
 - Birds
 - Using binoculars identify eight species of birds on the trail and in our bird observation tower
 - Make a birdhouse to take home. Mount it outside and watch it for the next few months
 - Reptiles and Amphibians
 - Even though you are extremely unlikely to encounter a snake in the marsh, we will show you how to recognize venomous snakes since there are some species in New Jersey
 - Look for terrapin nests and broken egg shells in the ground, and hopefully a terrapin itself!
 - Fish
 - Catch and identify two species of fish with seine or dip nets
 - Collect four kinds of animals eaten by fish in the wild using seine or dip nets
 - Mollusks and Crustaceans
 - Identify five species of mollusks and crustaceans.
 - Collect six shells to be discussed. Scouts can take **one** shell home, we will not mount the shells.
 - Soils and Rocks
 - Collect and identify soil layers found in a salt marsh using a soil corer



Nature
BSA Supply No. 35922

NOTE: The Wetlands Institute has a permit to collect animals for educational purposes. We do encourage you to enjoy the out doors while having minimal impact on the environment as possible. In other words, don't leave anything behind that isn't meant to be in nature and don't take away anything that *is* meant to be in nature.