



In-Person Scouts BSA Workshop Requirements



1. Bird Study

 COMPLETED DURING WORKSHOP

 COMPLETED AT HOME

REQUIREMENT NUMBER	REQUIREMENT DESCRIPTION
1	Explain the need for bird study and why birds are useful indicators of the quality of the environment. Describe how birds are part of the ecosystem.
2	Show that you are familiar with the terms used to describe birds by doing the following: a. Sketch or trace a perched bird and then labeling 15 different parts of the bird. b. Sketch or trace an extended wing and label six types of wing feathers.
3	Demonstrate that you know how to properly use and care for binoculars. a. Explain what the specification numbers on the binoculars mean. b. Show how to adjust the eyepiece and how to focus for proper viewing. c. Show how to properly care for and clean the lenses. d. Describe when and where each type of viewing device would be most effective.
4	Demonstrate that you know how to use a bird field guide. Show your counselor that you are able to understand a range map by locating in the book and pointing out the wintering range, the breeding range, and/or the year-round range of one species of each of the following types of birds: a. Seabird b. Plover c. Falcon or hawk d. Warbler or vireo e. Heron or egret f. Sparrow
5 <i>(Suggested to observe 5 birds at home)</i>	Observe and be able to identify at least 20 species of wild birds. Prepare a field notebook, making a separate entry for each species, and record the following information 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.



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6	Describe to your counselor how certain orders of birds are uniquely adapted to a specific habitat. In your description, include characteristics such as the size and shape of the following: a. Beak b. Body c. Leg and foot d. Feathers/plumage
7	Explain the function of a bird's song. Be able to identify five of the 20 species in your field notebook by song or call alone. Explain the difference between songs and calls. For each of these five species, enter a description of the song or call, and note the behavior of the bird making the sound. Note why you think the bird was making the call or song that you heard.
8B	By using a public library, the Internet, or contacting the National Audubon Society, find the name and location of the Christmas Bird Count nearest your home and obtain the results of a recent count. 1. Explain what kinds of information are collected during the annual event. 2. Tell your counselor which species are most common, and explain why these birds are abundant. 3. Tell your counselor which species are uncommon, and explain why these were present in small numbers. If the number of birds of these species is decreasing, explain why, and what, if anything, could be done to reverse their decline.
9C	Build a backyard sanctuary for birds by planting trees and shrubs for food and cover.
10	Do the following: a. Explain the difference between extinct, endangered, and threatened. b. Identify a bird species that is on the endangered or threatened list. Explain what caused their decline. Discuss with your counselor what can be done to reverse this trend and what can be done to help remove the species from the endangered or threatened list.
11	Identify a nonnative bird (introduced to North America from a foreign country since 1800). Describe how nonnative birds may become damaging to the ecosystem.
12	Identify three career opportunities connected to the study of birds. Pick one and find out the education, training, and experience required for this profession. Discuss with your counselor if this profession might interest you.



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2. Environmental Science

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REQUIREMENT NUMBER	REQUIREMENT DESCRIPTION
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 organization, 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, hybridvehicle, fuel cell.
3A3	Discuss what is an ecosystem. Tell how it is maintained in nature and how it survives.
3B3	Explain what is acid rain. In your explanation, tell how it affects plants and the environment and the steps society can take to reduce its effects.
3C2	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.
3D2	Perform an experiment to determine the effect of an oil spill on land. Discuss your conclusions with your counselor.
3E	<p>Endangered Species</p> <p>(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.</p> <p>(2) Do research on one species that was endangered or threatened but that 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.</p> <p>(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.</p>
3F	<p>Pollution Prevention, Resource Recovery, and Conservation</p> <p>(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.</p> <p>(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.</p> <p>(3) Perform an experiment on packaging materials to find out which ones are biodegradable. Discuss your conclusion with your counselor.</p>



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3G1	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.
3H	Invasive Species (1) Learn to identify the major invasive plant species in your community or camp and explain to your counselor what can be done to either eradicate or control their spread. (2) Do research on two invasive plant or animal species in your community or camp. Find out where the species originated, how they were transported to the United States, their life history, how they are spread, and the recommended means to eradicate or control their spread. Report your research orally or in writing to your counselor. (3) Take part in a project of at least one hour to eradicate or control the spread of an invasive plant species in your community or camp.
4A	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. Report to your counselor orally or in writing the biodiversity and population density of these study areas.
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 <i>(please complete research before workshop)</i>	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.



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3. Fish and Wildlife Management

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REQUIREMENT NUMBER	REQUIREMENT DESCRIPTION
1	Describe the meaning and purposes of fish and wildlife conservation and management.
2	List and discuss at least three major problems that continue to threaten your state's fish and wildlife resources.
3	Describe some practical ways in which everyone can help with the fish and wildlife effort.
4	List and describe five major fish and wildlife management practices used by managers in your state.
5	Do ONE of the following: a. Construct, erect, and check regularly at least two artificial nest boxes (wood duck, bluebird, squirrel, etc.) and keep written records for one nesting season. b. Construct, erect, and check regularly bird feeders and keep written records of the kinds of birds visiting the feeders. c. Develop and implement a fishery improvement project or a backyard wildlife habitat improvement project. Share the results with your counselor. d. Design and construct a wildlife blind near a game trail, water hole, salt lick, bird feeder, or birdbath and take good photographs or make sketches from the blind of any combination of 10 wild birds, mammals, reptiles, or amphibians.
6A	Observe and record 25 species of wildlife. Your list may include mammals, birds, amphibians, and fish. Write down when and where each animal was seen.
7C	Examine the stomach contents of three fish and record the findings. It is not necessary to catch any fish for this option. You must visit a cleaning station set up for fishermen or find another, similar alternative.
8	Using resources found at the library and in periodicals, books, and the internet (with your parent's permission), learn about three different positions held by fisheries and/or wildlife professionals. Find out the education and training requirements for each position.



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4. Oceanography

 COMPLETED DURING WORKSHOP

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REQUIREMENT NUMBER	REQUIREMENT DESCRIPTION
1	Name four branches of oceanography. Describe at least five reasons why it is important for people to learn about the oceans.
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.
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.
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.
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
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.
7A	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.
8B*	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.
9	Describe four methods that marine scientists use to investigate the ocean, underlying geology, and organisms living in the water.



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5. Reptile and Amphibian Study

 COMPLETED DURING WORKSHOP

 COMPLETED AT HOME

REQUIREMENT NUMBER	REQUIREMENT DESCRIPTION
1	Describe the identifying characteristics of six species of reptiles and four species of amphibians found in the United States. For any four of these, make sketches from your own observations or take photographs. Show markings, color patterns, or other characteristics that are important in the identification of each of the four species. Discuss the habits and habitats of all 10 species.
2	Discuss with your merit badge counselor the approximate number of species and general geographic distribution of reptiles and amphibians in the United States. Prepare a list of the most common species found in your local area or state.
3	Describe the main differences between (a) Amphibians and reptiles (b) Alligators and crocodiles (c) Toads and frogs (d) Salamanders and lizards (e) Snakes and lizards
4	Explain how reptiles and amphibians are an important component of the natural environment. List four species that are officially protected by the federal government or by the state you live in, and tell why each is protected. List three species of reptiles and three species of amphibians found in your local area that are not protected. Discuss the food habits of all 10 species.
5	Describe how reptiles and amphibians reproduce.
6	From observation, describe how snakes move forward. Describe the functions of the muscles, ribs, and belly plates.
7	Describe in detail six venomous snakes and the one venomous lizard found in the United States. Describe their habits and geographic range. Tell what you should do in case of a bite by a venomous species.



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8	<p>Do ONE of the following:</p> <p>(a) Maintain one or more reptiles or amphibians for at least a month. Record food accepted, eating methods, changes in coloration, shedding of skins, and general habits; or keep the eggs of a reptile from the time of laying until hatching; or keep the eggs of an amphibian from the time of laying until their transformation into tadpoles (frogs) or larvae (salamanders). Whichever you chose, keep records of and report to your counselor how you cared for your animal/eggs/larvae to include lighting, habitat, temperature and humidity maintenance, and any veterinary care requirements.</p> <p>(b) Choose a reptile or amphibian that you can observe at a local zoo, aquarium, nature center, or other such exhibit (such as your classroom or school). Study the specimen weekly for a period of three months. At each visit, sketch the specimen in its captive habitat and note any changes in its coloration, shedding of skins, and general habits and behavior. Discuss with your counselor how the animal you observed was cared for to include its housing and habitat, how the lighting, temperature, and humidity were maintained, and any veterinary care requirements.</p> <p>Find out, either from information you locate on your own or by talking to the caretaker, what this species eats and what are its native habitat and home range, preferred climate, average life expectancy, and natural predators. Also identify any human-caused threats to its population and any laws that protect the species and its habitat. After the observation period, share what you have learned with your counselor.</p>
9B	Identify by sight eight species of reptiles or amphibians.
9C	Using visual aids, give a brief talk to a small group on three different reptiles and amphibians.
10	Tell five superstitions or false beliefs about reptiles and amphibians and give a correct explanation for each. Give seven examples of unusual behavior or other true facts about reptiles and amphibians.



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6. Soil and Water Conservation



COMPLETED DURING WORKSHOP



COMPLETED AT HOME

REQUIREMENT NUMBER	REQUIREMENT DESCRIPTION
1	Do the following: (a) Tell what soil is. Tell how it is formed. (b) Describe three kinds of soil. Tell how they are different. (c) Name the three main plant nutrients in fertile soil. Tell how they can be put back when used up.
2	Do the following: (a) Define soil erosion. (b) Tell why it is important. Tell how it affects you. (c) Name three kinds of soil erosion. Describe each. (d) Take pictures or draw two kinds of soil erosion
3	Do the following: (a) Tell what is meant by conservation practices. (b) Describe the effect of three kinds of erosion-control practices. (c) Take pictures or draw three kinds of erosion-control practices.
4	Do the following: (a) Explain what a watershed is. (b) Outline the smallest watershed that you can find on a contour map. (c) Then outline on your map, as far as possible, the next larger watershed which also has the smallest in it. (d) Explain what a river basin is. Tell why all people living in a river basin should be concerned about land and water use in it. (e) Explain what an aquifer is and why it can be important to communities.
5	Do the following: (a) Explain what a watershed is. (b) Outline the smallest watershed that you can find on a contour map. (c) Then outline on your map, as far as possible, the next larger watershed which also has the smallest in it. (d) Explain what a river basin is. Tell why all people living in a river basin should be concerned about land and water use in it. (e) Explain what an aquifer is and why it can be important to communities.
6	Do the following: (a) Tell what is meant by "water pollution." (b) Describe common sources of water pollution and explain the effects of each. (c) Tell what is meant by "primary water treatment," "secondary waste treatment," and "biochemical oxygen demand." (d) Make a drawing showing the principles of complete waste treatment.



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7D	Study a soil survey report. Describe the things in it. On tracing paper over any of the soil maps, outline an area with three or more different kinds of soil. List each kind of soil by full name and map symbol.
7F	Carry out any other soil and water conservation project approved by your merit badge counselor.