



Environmental Science—

Dietz

NOTE: The official merit badge pamphlets are now free and downloadable [HERE](#).

ALSO NOTE: Requirements in **BOLD** print are prerequisites for this badge. They are: **2a,b; 3a or b or c; 4a or b or c; 5a or b or c; 6a or b or c; 7a or b or c.**

1. Describe the meaning of environmental science in your own words. Explain how you think we can use science to understand, conserve, and improve our environment.

Resource: [What Is Environmental Science? \(video\)](#)

2. **Ecology.** Do the following and discuss with your counselor:

Resources: [Merlin Bird App Description \(video\)](#)

[INaturalist App Description \(video\)](#)

[Observing Nature Through SMELL \(video\)](#)

- (a) Choose an area approved by your counselor and observe (sight, sound, and smell) its ecosystem over a two-day period.

Resources: [Observe Nature Like a Scientist! \(video\)](#)

[Observing Nature \(video\)](#)

[Backyard Nature \(video\)](#)

- (b) Make notes about the living, nonliving (e.g. rocks) and formerly living components. Include information about interactions among the components, including the food chain, predators, native species, and invasive species) and identify how human activities have affected the ecosystem.

3. **Air Pollution.** Do ONE of the following and discuss with your counselor:

Resource: [Air Pollution \(video\)](#)

- (a) Learn what Particulate Matter (PM) is, how PM gets into the air, what the harmful effects of PM are, and what is being done to reduce PM in the air. Then, perform an experiment to test for particulates that contribute to air pollution.

Resource: [Particulate Matter \(video\)](#)

- (b) Discuss how air pollution and transportation affect each other by giving at least three examples. Then, compare two modes of transportation (e.g., gasoline-powered v. electric vehicles, gasoline-powered car v. bicycle, etc.).
Resources: [Your Car's Exhaust \(video\)](#)
[Air Quality and Transportation \(video\)](#)
- (c) Learn about the Clean Air Act. Make notes on when it was passed, its environmental goals, what progress has been made and what remains to be done to achieve the law's goals. Describe the impact, benefits, and costs of the law as well as what is required to implement and enforce the law.
Resource: [Clean Air Act \(video\)](#)

4. Water Pollution. Do ONE of the following and discuss with your counselor:

Resource: [Hydrologic Cycle \(video\)](#)

- (a) Identify where your community sources water, how it is treated, and disposed. Obtain and review a water quality report from your area.
Resources: [Understanding a Drinking Water Quality Report \(video\)](#)
[Drinking Water Treatment \(video\)](#)
[Waste Water Treatment \(video\)](#) OR
- (b) Identify a local or regional area that experiences periodic flooding and/or drought. Collect facts on prior event(s) and investigate the environmental impacts of these extreme events.
Resources: [How to Use FEMA's Flood Search Tool \(video\)](#)
[Watersheds! \(video\)](#)
[Flash Flood at Philmont \(video\)](#)
[US Drought Map \(video\)](#) OR
- (c) Learn about the Clean Water Act. Make notes on when it was passed, its environmental goals, what progress has been made and what remains to be done to achieve the law's goals. Describe the impact, benefits, and costs of the law as well as what is required to implement and enforce the law.
Resources: [Clean Water Act \(video\)](#)
[Clean Water Act & the Chesapeake Bay \(video\)](#)

5. Land Pollution. Do ONE of the following and discuss with your counselor:

- (a) In an area (yard, park, golf course, farm, etc.) approved by your counselor, make a list of the pesticides, herbicides, and fertilizers used and how often they are applied. Identify the benefits of their use and the environmental impact, including effects on non-target species (including humans), what happens if the chemicals infiltrate into the groundwater, and what happens to any runoff of the chemicals.
Resources: [Do We Really Need Pesticides? \(video\)](#)
[Bald Eagle Study \(video\)](#)
- (b) Learn about the erosion process and identify an example of where erosion occurs. Determine where the eroded material ends up and how erosion can be minimized.
Resources: [Soil Erosion | Causes, Effects, and Solutions \(video\)](#)
[How Was the Grand Canyon Formed? \(video\)](#)
- (c) Learn about a land pollution incident that led to a site being listed on Environmental Protection Agency's Superfund National Priority List. Identify what caused the incident, what the effects were on the environment, what remediation

has been done, and the current condition of the site.

Resource: [Introduction to Superfund \(video\)](#)

6. Rare, Endangered, or Threatened Species. Do ONE of the following and discuss with your counselor:

- (a) Do research on one endangered species found in your state. Learn about its natural habitat, why it is endangered, what is being done to preserve it, and how many individual species are left in the wild. Prepare a 100-word report about the species and include a drawing or photo. Present your report to your patrol or troop.

Resources: [Endangered Species by US State \(video\)](#)

[Are Endangered Species Worth Saving? \(video\)](#)

[Saving Threatened Plants \(video\)](#)

- (b) Do research on one species that was endangered or threatened but that has now recovered. Learn about how the species recovered, and what its new status is. Prepare a 100-word report on the species and include a drawing or photo. Present your report to your patrol or troop.

Resources: [10 Success Stories \(video\)](#)

[Condor Saved! \(video\)](#)

[Whooping Cranes Saved! \(video\)](#)

- (c) With your parent or guardian and counselor's approval, work with a natural resource professional to identify a completed project that has been designed to improve the habitat for a threatened or endangered species in your area. Visit the site and report on what you saw to your patrol or troop.

Resources: [Butterfly Habitat Restoration \(video\)](#)

[Fisheries Habitat Restoration \(video\)](#)

[Everglades Restoration \(video\)](#)

7. Pollution Prevention, Resource Recovery, and Conservation. Do ONE of the following and discuss with your counselor:

- (a) Determine five ways to conserve resources or use resources more efficiently in your home, school, or camp. Practice at least two of these methods for at least one week.

Resources: [10 Ways to Take Care of the Environment \(video\)](#)

[Scouts and LNT \(video\)](#)

[10 Easy Ways to Save Water at Home and Help the Planet \(video\)](#)

[The Leave No Trace Basics \(video\)](#)

- (b) Explain Resource Recovery and why it is important to reduce pollution. Collect samples or take photos of ten items that can demonstrate the principle of Reduce, Reuse, Recycle. Explain your collection, how these materials are currently handled, and potential improvements.

Resources: [Reduce, Reuse, Recycle \(video\)](#)

[Upcycling Hacks \(video\)](#)

[The 3Rs \(video\)](#)

- (c) Identify five items in your household that will become hazardous waste. Explain how they should be properly stored, what special care is needed for disposal, and proper disposal options available in your area.

Resource: [Household Hazardous Waste Disposal \(video\)](#)

8. **Pollination.** Do ONE of the following and discuss with your counselor:

- (a) Investigate pollination and its importance to our environment and ecosystems. Make a list of five pollinators and the plants that attract them in your region. Explain the importance of pollinators and what Scouts can do to support pollinators in their area.
Resources: [Is It a Bee, a Wasp, a Fly, or a Moth? \(video\)](#)
[The Power of Pollinators \(video\)](#)
[How Pollination Works \(video\)](#)
- (b) Visit an area with flowering plants during pollination season for an hour to observe pollination. Record which pollinators are attracted to which plant. Explain the importance of pollinators and what Scouts can do to support pollinators in their area.
Resources: [The Beauty of Pollination \(video\)](#)
[Animal Pollinators! \(video\)](#)
- (c) Learn about the importance of pollination to agriculture, including the economic costs and benefits. Identify four crop-pollinator pairs. Explain the relationship of pollinators to agriculture.
Resources: [Pollinators and Agriculture \(video\)](#)
[Honey Bee Pollinator Contract Hives \(video\)](#)
[Almond Pollination \(video\)](#)

9. **Invasive Species.** In your community or camp, investigate two invasive plant or animal species. Learn where the species originated, how they were transported to this ecosystem, their life history, how they are spread, how they impact the native ecosystem, and the recommended means to eradicate or control their spread. Discuss what you learned with your counselor.

Resources: [The Threat of Invasive Species \(video\)](#)
[Why We Don't Kill Off Invasive Species \(video\)](#)

10. **Identify the environmental impact topics** that would need to be addressed for a construction project such as building a house, adding a new building to your Scout camp, or one you create on your own that is approved by your counselor. Evaluate the purpose and benefit of the proposed project, alternatives (including a no-action alternative), and any environmental consequences. Discuss with your counselor.

Resources: [What Is an EIA? \(video\)](#)
[EIA issues \(video\)](#)
[EIAs-Key to Sustainable Development \(video\)](#)

11. Identify **three career opportunities** that would use skills and knowledge in the environmental science field. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.

Resources: [EnvSci Future Careers \(video\)](#)

[What Do Environmental Engineers Do? \(video\)](#)
[What Do Environmental Scientists Do? \(video\)](#)

Special Note:

Scouts who complete Fish and Wildlife Management or Soil and Water Conservation, Environmental Science, and Citizenship in the World Merit Badges and an approved three-hour conservation project can obtain this award. Visit this link for more information [World_Conservation_Application-Scouts-BSA-1.pdf](#). Scouts will need to receive approval from their troop leadership on a project that addresses the conservation needs of more than one country (ideas include invasive plant species removal, butterfly box construction and installation, native trees planting, pollinator or rain garden installation, fishing line recycling tube construction and installation on a public waterway, rain barrel construction, food plot installation, bird nesting or bat box construction and installation, etc.).

Fish and Wildlife Management and Citizenship in the World merit badges are also offered at this Merit Badge College.