



Environmental Science

Scouts BSA · Nature · Eagle-required

Name

Started

Completed

Environmental Science is about how living things and their surroundings fit together, and how people can protect them. You'll observe nature closely, run hands-on activities, and look at real environmental challenges near you. It's an Eagle-required option and a great fit for Scouts who love the outdoors.

Requirements

Every official requirement, in plain language. Check the official wording when you sign off (scouting.org/merit-badges/environmental-science/). Tips and examples are ideas, not extra requirements.

- ☐ **1** Explain in your own words what environmental science means and how you think science can help us understand, protect, and improve the environment

Tip: Think of a local park or stream and talk about how scientists help keep it healthy.

Example: Use a local example: "Scientists tested our creek and found too many nutrients from lawn fertilizer, so the city planted a buffer of native plants along the bank." Explain how measuring the problem led to a fix.

2 Ecology

Tips for this section: Pick a spot like a backyard corner, a pond, or a field and visit several times. Bring a notebook and write down what you see each time.

Example for this section: Visit your spot at different times and record the date, weather, plants, animals or signs of them, and anything people have changed. A sketch map that you update each time shows how the place shifts.

- ☐ **2a** Observe the ecosystem of a counselor-approved area over two days, using sight, sound, and smell

- ☐ **2b** Take notes on the area's living, nonliving (such as rocks), and once-living parts and how they interact, including the food chain, predators, and native and invasive species, plus how people have affected the ecosystem; discuss your findings with your counselor

3 **Air pollution: Choose 1 of 3**

Tips for this section: Choose the air pollution activity you can do with materials you have. Record your results neatly so you can explain them.

Example for this section: One air activity: coat index cards with petroleum jelly, place them in different spots around your home or school, and check them with a magnifying glass after a few days. Compare which spots collected the most particles and explain why.

- ☐ **3a** Learn what particulate matter (PM) is, how it gets into the air, the harm it does, and what's being done to reduce it; then do an experiment to test for particulates that add to air pollution; discuss with your counselor

- ☐ **3b** Give at least three examples of how transportation and air pollution influence one another, then compare two ways of getting around (such as a gas vs. an electric car, or a car vs. a bike); discuss with your counselor

- ☐ **3c** Learn about the Clean Air Act and note when it passed, its goals, the progress so far, and what's still left to do; describe its impact, benefits, and costs and what it takes to carry out and enforce it; discuss with your counselor

4 Water pollution: Choose 1 of 3

Tips for this section: Pick the water option that fits where you live, like tracing your town's drinking water from source to tap with a water quality report, or looking into past floods or droughts nearby.

- ☐ **4a** Find out where your community's water comes from, how it's treated, and how wastewater is disposed of; get and review a local water quality report; discuss with your counselor

- ☐ **4b** Pick a local or regional area that has periodic floods and/or droughts, gather facts on past events, and look into their environmental effects; discuss with your counselor

- ☐ **4c** Learn about the Clean Water Act and note when it passed, its goals, the progress so far, and what's still left to do; describe its impact, benefits, and costs and what it takes to carry out and enforce it; discuss with your counselor

5 Land pollution: Choose 1 of 3

Tips for this section: Choose a land pollution activity that you can observe over time, and take photos or notes as you go.

- ☐ **5a** In a counselor-approved area (yard, park, golf course, farm, etc.), list the fertilizers, herbicides, and pesticides applied and how often; identify their benefits and environmental effects, including on non-target species like people, and what happens if they reach groundwater or run off; discuss with your counselor

- ☐ **5b** Learn how erosion works, find an example of where it happens, and figure out where the eroded material goes and how erosion can be reduced; discuss with your counselor

- ☐ **5c** Learn about a land pollution incident that put a site on the EPA's Superfund National Priorities List: its cause, environmental effects, cleanup done, and the site's current condition; discuss with your counselor

6 Rare, threatened, or endangered species: Choose 1 of 3

Tips for this section: Research an endangered plant or animal from your state and find out what's being done to help it.

Example for this section: Research an endangered species from your state, like a freshwater mussel, a bat, or a native butterfly. Explain why it's declining, what's being done, and one thing your family could do to help.

- ☐ **6a** Research an endangered species in your state: its natural habitat, why it's endangered, efforts to protect it, and how many remain in the wild; write a 100-word report with a drawing or photo, present it to your patrol or troop, and discuss with your counselor

- ☐ **6b** Research a species that was endangered or threatened but has recovered: how it recovered and its current status; write a 100-word report with a drawing or photo, present it to your patrol or troop, and discuss with your counselor

- ☐ **6c** With approval from your counselor and a parent or guardian, team up with a natural resource professional to find a finished project that improved habitat for a threatened or endangered species near you; visit the site, tell your patrol or troop what you observed, and discuss with your counselor

7 Pollution prevention, resource recovery, and conservation: Choose 1 of 3

Tips for this section: Pick a conservation activity you can keep doing, like saving water at home or reducing trash.

- ☐ **7a** Come up with five ways to conserve resources or use them more efficiently at home, school, or camp, and practice at least two of them for at least a week; discuss with your counselor

- ☐ **7b** Explain resource recovery and why reducing pollution matters; collect samples or photos of 10 items that show Reduce, Reuse, Recycle, and explain your collection, how those materials are handled now, and how that could improve; discuss with your counselor

- ☐ **7c** Identify five household items that will become hazardous waste, and explain how to store them safely, what special care disposal needs, and what disposal options exist in your area; discuss with your counselor

8 Pollination: Choose 1 of 3

Tips for this section: Watch flowers in a garden or park and notice which insects or birds visit them.

Example for this section: Spend an hour watching flowering plants in a garden or park during pollination season. Record which visitors, like bees, flies, butterflies, and hummingbirds, land on which flowers. Then explain why pollinators matter and one way Scouts can help them nearby.

- ☐ **8a** Investigate pollination and why it matters to the environment and ecosystems; list five pollinators in your region and the plants that draw them; explain why pollinators are important and how Scouts can help them locally; discuss with your counselor

- ☐ **8b** Spend an hour watching pollination where plants are flowering in pollination season, recording which pollinators visit which plants; explain why pollinators are important and how Scouts can help them locally; discuss with your counselor

- ☐ **8c** Learn why pollination matters to farming, including what it costs and what it's worth economically; name four pairs of crops and their pollinators, and explain how pollinators and agriculture are connected; discuss with your counselor

- ☐ **9** Investigate two invasive plant or animal species in your community or camp: where they came from, how they got here, their life history, how they spread, their effect on the native ecosystem, and recommended ways to remove or control them; discuss what you learned with your counselor

Tip: Ask a park ranger or extension office which invasive species are a problem in your area, then learn how they spread.

Example: Pick two invasives from your area, like Japanese honeysuckle, zebra mussels, or emerald ash borer. Explain how each arrived, how it spreads, and what's being done, like cleaning boats or not moving firewood.

- ☐ **10** Pick a building project (a house, a new building at your Scout camp, or a counselor-approved idea of your own) and identify the environmental impact topics it would need to address; evaluate its purpose and benefits, alternatives (including taking no action), and environmental consequences; discuss with your counselor

Tip: Look at a construction site in your town and think about how it affects soil, water, and wildlife.

Example: Look at a construction site from the sidewalk. Is there silt fence keeping mud out of storm drains? Were trees removed? Explain how soil, water runoff, and wildlife could be affected, and what the builders are doing about it.

- ☐ **11** Name three careers that use environmental science skills; for one of them, research its training, education, certification, experience, and costs, plus job outlook, starting pay, and advancement; discuss with your counselor what you learned and whether the career interests you

Tip: Talk with someone who works in conservation, a park, or an environmental agency about their career.