



# Environmental Science

## Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet.

The work space provided for each requirement should be used by the Scout to make notes for discussing the item with his counselor, not for providing the full and complete answers. Each Scout must do each requirement.

No one may add or subtract from the official requirements found in **Boy Scout Requirements** (Pub. 33216 – SKU 34765).

The requirements were last issued or revised in 2006 • This workbook was updated in April 2012.

Scout's Name: \_\_\_\_\_ Unit: \_\_\_\_\_

Counselor's Name: \_\_\_\_\_ Counselor's Phone No.: \_\_\_\_\_

<http://www.USScouts.Org> • <http://www.MeritBadge.Org>

Please submit errors, omissions, comments or suggestions about improving this workbook to: [Workbooks@USScouts.org](mailto:Workbooks@USScouts.org)

1. Make a timeline of the history of environmental science in America.

1500s	1600s	1700s	1800s	1900s	2000s

Identify the contribution made by the Boy Scouts of America to environmental science. Include dates, names of people or organizations, and important events.

Date	People/Organization	Event
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

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.

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: \_\_\_\_\_

\_\_\_\_\_







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 non-plant species you find.

Study Plot Location 1: \_\_\_\_\_ Number of Species: \_\_\_\_\_

Plant Species	Space each occupies
Non-Plant Species	Number found

Study Plot Location 2: \_\_\_\_\_ Number of Species: \_\_\_\_\_

Plant Species	Space each occupies
Non-Plant Species	Number found

- 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.

**Study Area 1:**

**Visit 1 Date:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_ **Time Ended** \_\_\_\_\_

Observations of living parts: \_\_\_\_\_

\_\_\_\_\_

Observations of nonliving parts: \_\_\_\_\_

\_\_\_\_\_

Differences noted: \_\_\_\_\_

\_\_\_\_\_

**Visit 2 Date:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_ **Time Ended** \_\_\_\_\_

Observations of living parts: \_\_\_\_\_

\_\_\_\_\_

Observations of nonliving parts: \_\_\_\_\_

\_\_\_\_\_

Differences noted: \_\_\_\_\_

\_\_\_\_\_

**Visit 3 Date:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_ **Time Ended** \_\_\_\_\_

Observations of living parts: \_\_\_\_\_

\_\_\_\_\_

Observations of nonliving parts: \_\_\_\_\_

\_\_\_\_\_

Differences noted: \_\_\_\_\_

\_\_\_\_\_

**Study Area 2:**

**Visit 1 Date:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_ **Time Ended** \_\_\_\_\_

Observations of living parts: \_\_\_\_\_

\_\_\_\_\_

Observations of nonliving parts: \_\_\_\_\_

\_\_\_\_\_

Differences noted: \_\_\_\_\_

\_\_\_\_\_

**Visit 2 Date:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_ **Time Ended** \_\_\_\_\_

Observations of living parts: \_\_\_\_\_

\_\_\_\_\_

Observations of nonliving parts: \_\_\_\_\_

\_\_\_\_\_

Differences noted: \_\_\_\_\_

\_\_\_\_\_

**Visit 3 Date:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_ **Time Ended** \_\_\_\_\_

Observations of living parts: \_\_\_\_\_

\_\_\_\_\_

Observations of nonliving parts: \_\_\_\_\_

\_\_\_\_\_

Differences noted: \_\_\_\_\_

\_\_\_\_\_

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. \_\_\_\_\_

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\_\_\_\_\_

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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. \_\_\_\_\_

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6. Find out about three career opportunities in environmental science.

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Pick one and find out the education, training, and experience required for this profession. \_\_\_\_\_

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Discuss this with your counselor, and explain why this profession might interest you. \_\_\_\_\_

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**Requirement resources can be found here:**  
[http://www.meritbadge.org/wiki/index.php/Environmental\\_Science#Requirement\\_resources](http://www.meritbadge.org/wiki/index.php/Environmental_Science#Requirement_resources)

## Important excerpts from the [‘Guide To Advancement’](#), No. 33088:

Effective January 1, 2012, the *‘Guide to Advancement’* (which replaced the publication *‘Advancement Committee Policies and Procedures’*) is now the *official* Boy Scouts of America source on advancement policies and procedures.

- **[ Inside front cover, and 5.0.1.4 ] — Unauthorized Changes to Advancement Program**  
***No council, committee, district, unit, or individual has the authority to add to, or subtract from, advancement requirements.***  
(There are limited exceptions relating only to youth members with disabilities. For details see section 10, “Advancement for Members With Special Needs”.)
- **[ Inside front cover, and 7.0.1.1 ] — The [‘Guide to Safe Scouting’](#) Applies**  
Policies and procedures outlined in the *‘Guide to Safe Scouting’*, No. 34416, apply to all BSA activities, including those related to advancement and Eagle Scout service projects. [Note: Always reference the online version, which is updated quarterly.]
- **[ 7.0.3.1 ] — The Buddy System and Certifying Completion**  
Youth members must not meet one-on-one with adults. Sessions with counselors must take place where others can view the interaction, or the Scout must have a buddy: a friend, parent, guardian, brother, sister, or other relative —or better yet, another Scout working on the same badge— along with him attending the session. When the Scout meets with the counselor, he should bring any required projects. If these cannot be transported, he should present evidence, such as photographs or adult certification. His unit leader, for example, might state that a satisfactory bridge or tower has been built for the Pioneering merit badge, or that meals were prepared for Cooking. If there are questions that requirements were met, a counselor may confirm with adults involved. Once satisfied, the counselor signs the blue card using the date upon which the Scout completed the requirements, or in the case of partials, initials the individual requirements passed.
- **[ 7.0.3.2 ] — Group Instruction**  
It is acceptable—and sometimes desirable—for merit badges to be taught in group settings. This often occurs at camp and merit badge midways or similar events. Interactive group discussions can support learning. The method can also be attractive to “guest experts” assisting registered and approved counselors. Slide shows, skits, demonstrations, panels, and various other techniques can also be employed, but as any teacher can attest, not everyone will learn all the material.

There must be attention to each individual’s projects and his fulfillment of *all* requirements. We must know that every Scout — actually and *personally*— completed them. If, for example, a requirement uses words like “show,” “demonstrate,” or “discuss,” then every Scout must do that. It is unacceptable to award badges on the basis of sitting in classrooms *watching* demonstrations, or remaining silent during discussions. Because of the importance of individual attention in the merit badge plan, group instruction should be limited to those scenarios where the benefits are compelling.

- **[ 7.0.3.3 ] — Partial Completions**  
Scouts need not pass all requirements with one counselor. The Application for Merit Badge has a place to record what has been finished — a “partial.” In the center section on the reverse of the blue card, the counselor initials for each requirement passed. In the case of a partial completion, he or she does not retain the counselor’s portion of the card. A subsequent counselor may choose not to accept partial work, but this should be rare. A Scout, if he believes he is being treated unfairly, may work with his Scoutmaster to find another counselor. An example for the use of a signed partial would be to take it to camp as proof of prerequisites. Partials have no expiration except the 18th birthday.