

Environmental Science Merit Badge

Scout's Name: _____ Unit: _____

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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.

Do this before coming to the merit badge workshop, using merit badge pamphlet. We will discuss in workshop.

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

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

(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.

Pick an area and do this before coming to the merit badge workshop. Visit your area three times over a two-day period. We will discuss in workshop.

Description of Study Area: _____

Visit 1 Date: _____ Time Started: _____ Time Ended _____

General Observations (sight, sound, smell):

Observations about living components:

Observations about non-living components:

Observations about formerly living components:

Interaction between components:

Impacts of human activities:

Visit 2 Date: _____ **Time Started:** _____ **Time Ended** _____

General Observations (sight, sound, smell):

Observations about living components:

Observations about non-living components:

Observations about formerly living components:

Interaction between components:

Impacts of human activities:

Visit 3 Date: _____ **Time Started:** _____ **Time Ended** _____

General Observations (sight, sound, smell):

Observations about living components:

Observations about non-living components:

Observations about formerly living components:

Interaction between components:

Impacts of human activities:

3. Air Pollution:

(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.

We will cover this in the workshop.

OPTIONAL: with permission from your parent/guardian, do a short internet search about the Clean Air Act and make some notes about what you learn.

4. Water Pollution:

(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.

We will cover this in the workshop.

OPTIONAL: with permission from your parent/guardian, do a short internet search about the Clean Water Act and make some notes about what you learn.

5. Land Pollution:

(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.

We will cover this in the workshop.

6. Rare, Threatened, or Endangered 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.
- (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.

With permission from your parent/guardian, do a short internet search and write a 100-word report. You may do this for 6a (Texas endangered species) OR 6b (formerly endangered but now recovered). You may pick from the lists below or choose your own from your research. We will discuss in the workshop.

Texas Endangered Species	Texas Recovered Species (Formerly Endangered)
Houston Toad	Bald Eagle
Whooping Crane	Peregrine Falcon
Black Bears	Sea Otter
Ocelot	Brown Pelican
Texas Kangaroo Rat	Gray Wolf
Black-tailed Prairie Dog	
Texas Horned Lizard	
Green Sea Turtle	

7. Pollution Prevention, Resource Recovery, and Conservation.

- (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.

We will cover this in the workshop. In preparation, make a collection of at least 5 items to demonstrate the principle of Reduce/Reuse/Recycle. Be creative! Only one of your items can be an aluminum can or plastic bottle; the rest must be something else. We will spread them out on the table and discuss.

8. Pollination:

(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.

We will cover this in the workshop.

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.

With permission from your parent/guardian, do a short internet search and write some notes on what you learned. You may pick from the list below or choose your own from your research. Select two. We will discuss in the workshop.

Texas Invasive Animal Species	Texas Invasive Plant Species
Feral hogs	Giant salvinia (Salvinia molesta)
Nutria	Hydrilla
European Starling	Water hyacinth
Red Imported Fire Ant	Chinese tallow tree
Zebra mussel	Alligator weed
Apple snail	Saltcedar Tree

Name #1 of Invasive Species: _____

Notes:

Name #2 of Invasive Species: _____

Notes:

10. Environmental Impact Statement:

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.

We will cover this in the workshop.

11. Careers in Environmental Science:

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.

Using the merit badge pamphlet or internet search (with parent/guardian permission), make some notes about one career opportunity. We will discuss in the workshop.

Potential Career Researched: _____

Education, Training, and Certification Needed:

Expenses to Enter the Career, and Expected Starting Salary:
