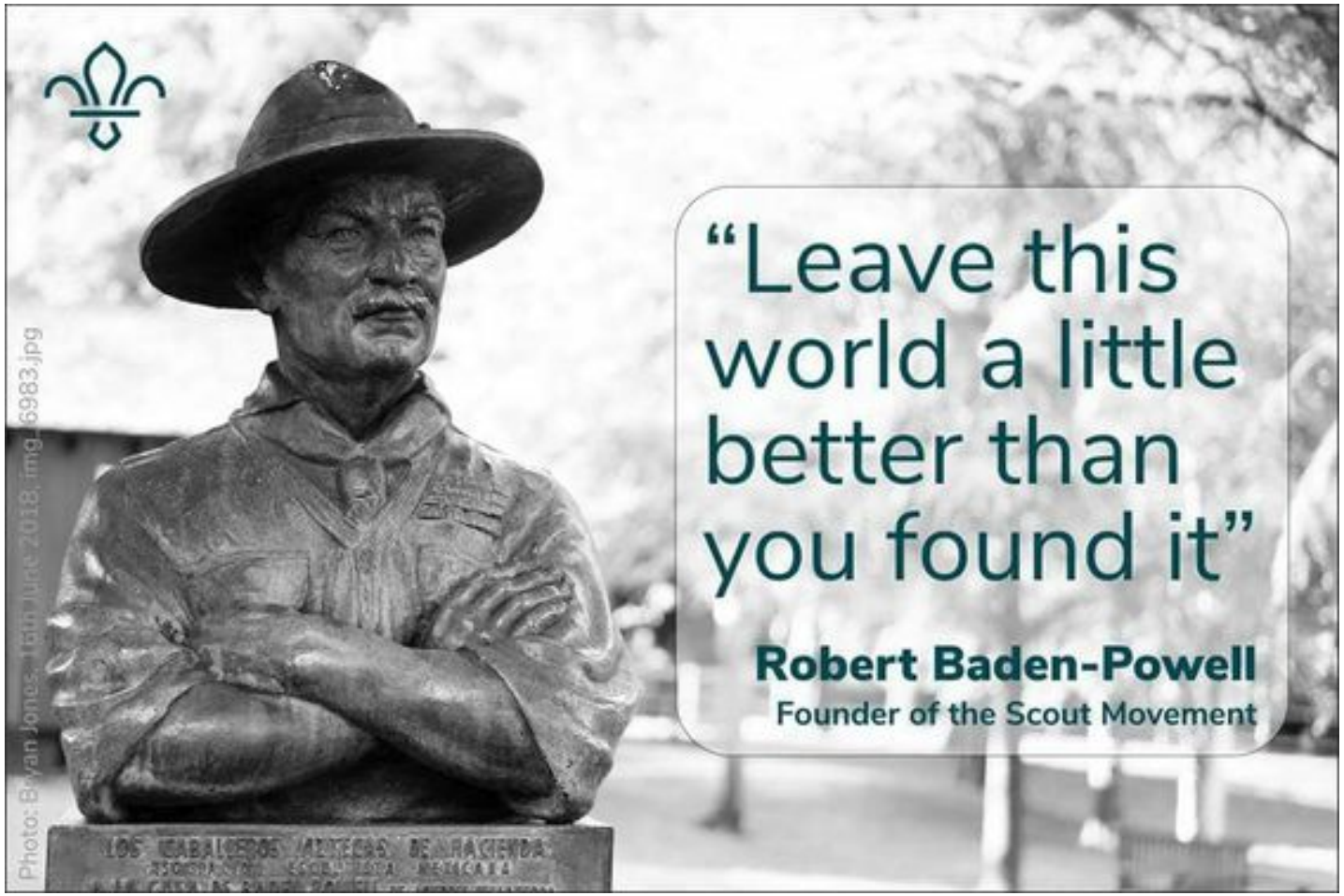

"Leave this world a little better than you found it"
Robert Baden-Powell
Founder of the Scout Movement
Photo: Bryan Jones - 15th June 2018 img_6983.jpg

An Eagle Required
Merit Badge

Environmental Science

Credit To:
Gretchen Shumpert & Robert Carlin

Requirement 1:

- Make a timeline of the history of environmental science in America.
- Identify the contributions made by the Boy Scouts of America to environmental science.
- Include dates, names of people or organizations, and important events.

Use Google (with your parent's permission) or check out these timelines for ideas. Use your own words and format:

https://www.sutori.com/story/a-timeline-of-the-history-of-environmental-science-in-america--4T7voVGxQE7MWEXTqm5yk69c

http://hawkmountaincamp.freeservers.com/envisci.htm

https://www.timetoast.com/timelines/history-of-environmental-science-in-the-united-states

Requirement

2

Definitions

Define the Following Terms:

(to be completed on your own)

- 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

Requirement 3:

Do ONE activity from seven of the following categories (A through H)

- Use the activities from the Scout pamphlet as the bases for planning and carrying out your projects
- We are contacting local organizations to help discuss several of these items.

Requirement

3a3

Ecology

What is an Ecosystem?

- A biological community of interacting organisms and their physical environment
- Ecosystems depend on a careful balance of relationships to be maintained and to adjust in order to survive.

Requirement

3a3

Ecology

What is in this Ecosystem?

Prepared. For Life.™

Requirement
3b3

Air
Pollution

What is Acid Rain?

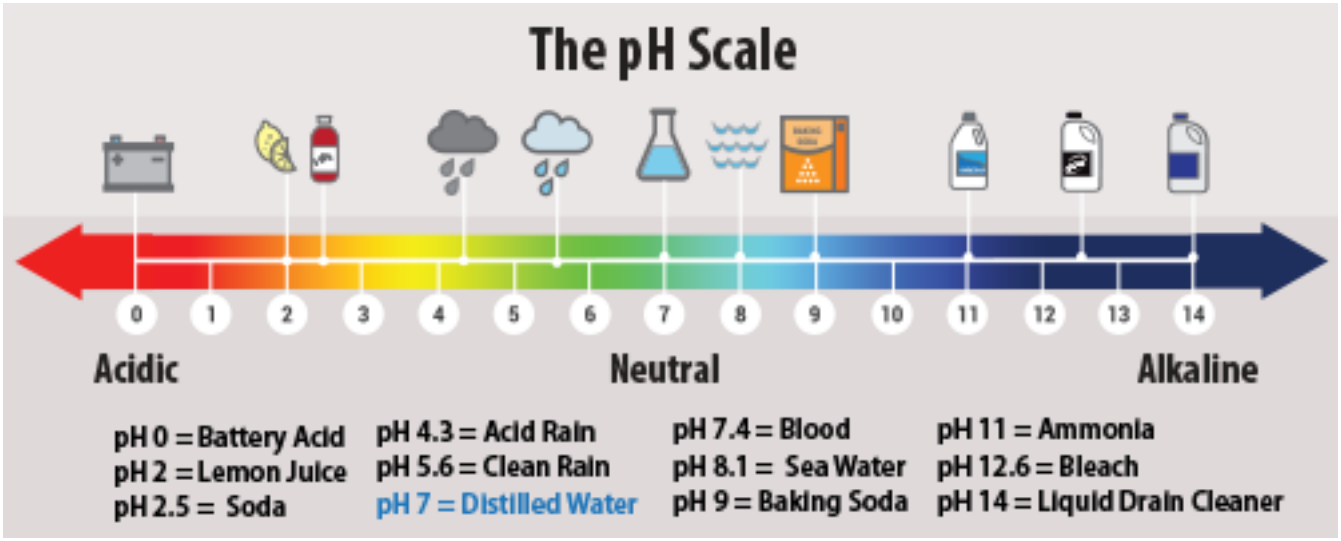
https://www.youtube.com/watch?v=1PDjVDIrFec

- **Acid rain is caused primarily by sulfur dioxide and nitrogen oxides.**
- **These gases come mainly from human activities like vehicles and power plants that burn fossil fuels that mix with water vapor in the air.**
- **The water vapor becomes more acidic and when it falls as rain it affects plants and the environment.**

Requirement

3b3

Air Pollution



Rain is naturally slightly acidic (5.6 pH) due to Carbon dioxide in the atmosphere

The additions of the sulfur dioxide and nitrogen oxides drops the pH to 5 or lower and it is known as acid rain.

Requirement
3b3

Air
Pollution

Why is Acid Rain a problem?

- Plants can die or be weakened so that they are more easily harmed by other stresses (temp., insects, drought).
- Damages aquatic ecosystems by changing the pH of the water.
- Gases easily blown to other counties, states, countries by winds.

Requirement
3b3

Air
Pollution

What can be done?

- **Limit the use of Fossil Fuels and reduce pollutants**
- **Carpool**
- **Conserve Energy by turning of lights and equipment when not using**
- **Limit air conditioning and adjust the thermostat.**

- **3C - 3H - To Be Completed Later**

Requirement

4

Choose your favorite:

Choose one to do on your own:

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. Report to your counselor orally or in writing the biodiversity and population density of these study areas.

(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. Discuss your observations with your counselor.

Requirement
5

Requirement 5:

Using the construction project provided or a plan you create on your own (hypothetical / imaginary project) , identify the items that would need to be included in an environmental impact statement for the project planned.

- **Steps and Questions are clearly detailed in Scout Pamphlet**

Requirement
5

What should be considered/included for an Environmental Impact Statement?

- **Site Description**
- **How the Proposed project fits into the existing plans for the area**
- **How the project will likely affect the environment**
  - Will it cause soil erosion
  - Will it disturb forests, grasslands, deserts or other ecosystems?
  - Will it disturb any habitats of endangered or threatened species?

Requirement
5

What should be considered/included for an Environmental Impact Statement? (Cont.)

- Identify any effects of the project that may be harmful but cannot be avoided.
- Suggest alternatives to the project that would protect the environment and still meet the needs of the people.
- Discuss tradeoffs between short and long term environmental losses and the short and long term benefits of the proposed project
- Determine how the proposed project would permanently prevent other uses of the site.

Requirement
6

Environmental Science Careers

- Conservationist
- Park Ranger
- Environmental Planner
- Environmental Scientist
- Energy Manager
- Environmental Engineer
- Environmental Lawyer
- Climatologist
- Geologist
- Chief Sustainability Director
- Teacher
- Oceanographer
- Zoologist
- Molecular Biologist
- Meteorologist
- Landscape Architect
- Hydrologist
- Anthropologist
- Archaeologist
- Ecologist
- Geographer
- Marine Biologist
- Microbiologist
- Entomologist
- Paleontologist
- Herpetologist
- Seismologist
- Wildlife Biologist
- Agricultural Engineer