

## **Soil and Water Conservation/Geology**

### **Prepared by:**

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### **Target Group:**

Any Scout

### **Time Allotted:**

Two, one-hour blocks

### **Materials Needed – Staff:**

Geological Map of the area  
Topographical Map  
Hammer  
Small Pick  
Screen boxes for washing  
Magnifying Glass  
Shovels  
Small hand spades  
Assorted brushes of different sizes  
Contour Map  
Water Cycle Poster  
Tools for Conservation Project  
Paper and colored pencils or markers  
Stream Table (if possible borrow from Department of Conservation)

### **Materials Needed – Scout:**

Notebook  
Pencil/pen  
Merit Badge Pamphlet

### **Instructional Goal:**

Upon completion of the activity, the Scout will have an introductory understanding about the subjects of Geology and Soil and Water Conservation. The Scout will understand basic differences between rocks and minerals and will understand the Sedimentary Process. Scouts will also understand the principals of soil and water conservation as well as be able to identify different types of soil and water pollutions.

## MONDAY

### **(Geo)Requirement 1**

Define Geology. Discuss how geologists learn about rock formations. In geology, explain why the study of the present is important to understanding the past.

### **(Geo)Requirement 2**

Pick three resources that can be extracted or mined from Earth for commercial use. Discuss with your counselor how each product is discovered and processed.

### **(Geo)Requirement 3**

Review a geological map of your area with your counselor and discuss the different rock types and estimated ages of rocks represented. Determine whether the rocks are horizontal, folded, or faulted, and explain how you arrived at your conclusion.

*\*Note: We have maps of Camp Geiger, lay them out on the table and have the scouts familiarize themselves with the map and the location of landmarks. Then identify the rock types noted above.*

### **(Geo)Requirement 6**

Find out about three career opportunities available in geology. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor and explain why this profession might interest you.

### **(Geo)Requirement 4C 4**

List three of the most common road building materials used in your area. Explain how each material is produced and how each is used in road building.

## TUESDAY

### **(Geo)Requirement 4C (Mineral Resources Option)**

#### **(Geo)Requirement 4C 1**

Define rock. Discuss the three classes of rocks including their origin and characteristics.

#### **(Geo)Requirement 4C 2**

Define mineral. Discuss the origin of minerals and their chemical composition and identification properties, including hardness, specific gravity, color, streak, cleavage, luster, and crystal form.

*\*Note: Have scouts look at our mineral collection, and identify the ones they recognize and have seen before.*

**(Geo)Requirement 4c 3a**

Collect 10 different rocks or minerals. Record in a notebook where you obtained (found, bought, traded) each one. Label each specimen, identify its class and origin, determine its chemical composition, and list its physical properties. Share your collection with your counselor.

**(Geo)Requirement 5a**

Discuss with your counselor the importance of the Leave No Trace Seven Principles and the Outdoor Code as they relate to the study of geology.

**(Geo)Requirement 5b**

Explain how you practiced the Leave No Trace Seven Principles and the Outdoor Code while traveling in natural areas and while collecting rock and fossil specimens for this merit badge.

*\*Note: Spend time on the first part of the requirement collecting rocks and minerals. Use the end of Tuesday and the first 10 minutes of Wednesday (if needed) to label everything.*

**WEDNESDAY**

**(Geo)Requirement 4C 5b**

With your counselor, choose two examples of rocks and two examples of minerals. Discuss the mining of these materials and describe how each is used by society.

**(SaWC)Requirement 1**

Do the following:

- (a) Tell what soil is. Tell how it is formed.
- (b) Describe three kinds of soil. Tell how they are different.
- (c) Name the three main plant nutrients in fertile soil. Tell how they can be put back when used up.

**(SaWC)Requirement 4**

Do the following:

- (a) Explain what a watershed is.
- (b) Outline the smallest watershed that you can find on a contour map.
- (c) Outline on your map, as far as possible, the next larger watershed which also has the smallest one in it.
- (d) Explain what a river basin is. Tell why all people living in a river basin should be concerned about land and water use in it.
- (e) Explain what an aquifer is and why it can be important to communities.

## THURSDAY

### **(SaWC)Requirement 3**

Do the following:

- (a) Tell what is meant by “conservation practices.”
- (b) Describe the effect of three kinds of erosion-control practices.
- (c) Take pictures of or draw three kinds of erosion-practices.

*\*Note: It is beneficial to take a short walk around camp and identify a few different types of erosion as well as erosion prevention practices we have in place around camp. Use this opportunity to discuss with scouts what can be done to prevent erosion in this area, or how the prevention practices could be improved.*

### **(SaWC)Requirement 5**

Do the following:

- (a) Make a drawing to show the hydrologic cycle.
- (b) Show by demonstration at least two of the following actions of water in relation to the soil: percolation, capillary action, precipitation, evaporation, transpiration.
- (c) Explain how removal of vegetation will affect the way water runs off a watershed.
- (d) Tell how uses of forest, range, and farmland affect usable water supply.
- (e) Explain how industrial use affects water supply.

*\*Activity: If Camp is able to borrow a Stream Table from the Department of Conservation, then Scouts can spend part of the time from Wednesday with the Stream Table. The instructor can explain many of the basic principles the Stream Table is able to show the scouts and allow the scouts ample time to experiment with the Stream Table.*

## FRIDAY

### **(SaWC)Requirement 2**

Do the following:

- (a) Define soil erosion.
- (b) Tell why soil conservation is important. Tell how it affects you.
- (c) Name three kinds of soil erosion. Describe each.
- (d) Take pictures of or draw two kinds of soil erosion.

### **(SaWC)Requirement 6**

Do the following:

- (a) Tell what is meant by “water pollution.”
- (b) Describe common sources of water pollution and explain the effects of each.
- (c) Tell what is meant by “primary water treatment,” “secondary waste treatment,” and “biochemical oxygen demand.”
- (d) Make a drawing showing the principles of complete waste treatment.

**(SaWC)Requirement 7e**

Make a list of places in your neighborhood, camps, school ground, or park having erosion, sedimentation, or pollution problems. Describe how these could be corrected through individual or group action.

**(SaWC)Requirement 7f**

Carry out any other soil and water conservation project approved by your merit badge counselor.

*\*Note: Meet with the Nature Director and Conservation Director during staff week to establish a valuable project for this requirement.*