



# NATURE SYLLABUS

Yawgoog Scout Reservation

Revised  
1.19.24

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# Astronomy

**Prerequisites:** N/A

**Homework:** 4c, 6a, 6b

- Req 4c: Make two sketches of the Big Dipper. In one sketch, show the Big Dipper's orientation in the early evening sky. In another sketch, show its position several hours later. In both sketches, show the North Star and the horizon. Record the date and time each sketch was made.
- Req 6a: Sketch the face of the Moon and indicate at least five seas and five craters. Label these landmarks.
- Req 6b: Sketch the phase and position of the Moon, at the same hour and place, for four nights within a one-week period. Include landmarks on the horizon such as hills, trees, and buildings. Explain the changes you observe.

**Classwork:** 1, 2, 3, 4a, 4b, 4d, 5, 6c, 6d, 7, 8, 9

**Day 1:**

- Take attendance and introduce yourself as their instructor.
- Assign and explain homework.
- Explain the 'Star Gazer' and which evening you will be holding it.
- Req 5a: List the names of the five most visible planets. Explain which ones can appear in phases like lunar phases and which ones cannot and explain why.
- Req 5b: Using the internet (with your parent's permission) and other resources, find out when each of the five most visible planets that you identified in requirement 5a will be observable in the evening sky during the next 12 months, then compile this information in the form of a chart or table.
- Req 5c: Describe the motion of the planets across the sky.

**Day 2:**

- Take attendance and remind Scouts of the homework.
- Req 6c: List the factors that keep the Moon in orbit around Earth.
- Req 6d: With the aid of diagrams, explain the relative positions of the Sun, Earth, and the Moon at the times of lunar and solar eclipses,

and at the times of new, first-quarter, full, and last-quarter phases of the Moon.

### **Day 3:**

- Take attendance and remind Scouts of the homework.
- Req 7a: Describe the composition of the Sun, its relationship to other stars, and some effects of its radiation on Earth's weather and communications.
- Req 7b: Define sunspots and describe some of the effects they may have on solar radiation.
- Req 7c: Identify at least one red star, one blue star, and one yellow star (other than the Sun). Explain the meaning of these colors.
- Mention that this is the last day before the class ends and to bring the homework tomorrow.

### **Day 4:**

- Take attendance.
- Check homework for completeness.
- Req 9: Find out about three career opportunities in astronomy. 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.
- Req 2: Explain what light pollution is and how it and air pollution affect astronomy.
- Req 3: With the aid of diagrams (or real telescopes if available), do each of the following:
  - Req 3a: Explain why binoculars and telescopes are important astronomical tools. Demonstrate or explain how these tools are used.
  - Req 3c: Explain the purposes of at least three instruments used with astronomical telescopes.
  - Req 3d: Describe the proper care and storage of telescopes and binoculars both at home and in the field.

### **Pre-Star Gazer:**

- Req 1a: Explain to your counselor the most likely hazards you may encounter while participating in astronomy activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards.
- Req 1b: Explain to your counselor the most likely hazards you may encounter while participating in astronomy activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards.
- Req 1c: Describe the proper clothing and other precautions for safely making observations at night and in cold weather. Then explain how to safely observe the Sun, objects near the Sun, and the Moon.
- Req 3b: Describe the similarities and differences of several types of astronomical telescopes, including at least one that observes light beyond the visible part of the spectrum (i.e., radio, X-ray, ultraviolet, or infrared). \*Use telescopes to show the different types

### **Star Gazer:**

- Req 8c: Help an astronomy club in your community hold a star party that is open to the public.
- Req 5d: Observe a planet and describe what you saw.
- Req 4a: Identify in the sky at least 10 constellations, at least four of which are in the zodiac.
- Req 4b: Identify in the sky at least eight conspicuous stars, five of which are of magnitude 1 or brighter.
- Req 4d: Explain what we see when we look at the Milky Way.
- Req 3a: Explain why binoculars and telescopes are important astronomical tools. Demonstrate or explain how these tools are used.

# Environmental Science

**Prerequisites:** N/A

**Homework:** 4b, 3e<sub>1</sub>

- Req 4b: 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.
- Req 3e<sub>1</sub>: Do research on one endangered species found in your state. Find out what its natural habitat is, why it is endangered, what is being done to preserve it, and how many individual organisms are left in the wild. Prepare a 100-word report about the organism, including a drawing. Present your report to your patrol or troop.

**Classwork:** 1,2,3a<sub>3</sub>,3b<sub>3</sub>,3c<sub>2</sub>,3d<sub>1</sub>,3f<sub>2</sub>,3g<sub>1</sub>,5,6

**Day 1:**

- Take attendance and introduce yourself as their instructor.
- Assign and explain homework.
- Req 3f<sub>2</sub>: Determine 10 ways to conserve resources or use resources more efficiently in your home, at school, or at camp. Practice at least two of these methods for seven days and discuss with your counselor what you have learned.
- Req 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.
- Req 3a<sub>3</sub>: Discuss what is an ecosystem. Tell how it is maintained in nature and how it survives.

## Day 2:

- Take attendance and remind Scouts of the homework.
- Req 3b<sub>3</sub>: Explain what acid rain is. In your explanation, tell how it affects plants and the environment and the steps society can take to help reduce its effects.
- Req 3g<sub>1</sub>: Using photographs or illustrations, point out the differences between a drone and a worker bee. Discuss the stages of bee development (eggs, larvae, pupae). Explain the pollination process, and what propolis is and how it is used by honeybees. Tell how bees make honey and beeswax, and how both are harvested. Explain the part played in the life of the hive by the queen, the drones, and the workers.

## Day 3:

- Take attendance and remind Scouts of the homework.
- Req 3c<sub>2</sub>: Conduct an experiment to identify the methods that could be used to mediate (reduce) the effects of an oil spill on waterfowl. Discuss your results with your counselor.
  - You will need:
    - 1 Bucket
    - Cooking oil
    - Gojo soap
  - Procedure:
    - Fill the bucket with water.
    - Pour a small amount of oil into the bucket to create a slick.
    - Explain the effects of oil on an aquatic environment including birds.
    - Dip a feather into the water to show the effects.
    - Add soap to the bucket to show the oil break down.
    - Discuss different ways humans address oil spills (enzymes/bacteria, sponges, FIRE, etc.)
- Req 3d<sub>1</sub>: Conduct an experiment to illustrate soil erosion by water. Take photographs or make a drawing of the soil before and after your experiment and make a poster showing your results. Present your poster to your counselor.

- You will need:
  - 2 troughs in trough holder
  - 1 bucket of water
- Procedure:
  - fill one trough with dirt and the other with grass.
  - Place troughs in the trough container
  - Lean the container at an angle.
  - Pour water into the troughs respectively.
  - Explain the reasons behind the different rates of erosion.
- Mention that this is the last day before the class ends and to bring homework tomorrow.

#### **Day 4:**

- Take attendance.
- Check homework for completeness.
- Req 1: Make a timeline of the history of environmental science in America. Identify the contribution made by the Boy Scouts of America to environmental science. Include dates, names of people or organizations, and important events.
- Req 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.
- Req 6: Find out about three career opportunities in environmental science. 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.



# Fish and Wildlife Management

**Prerequisites:** N/A

**Homework:** 6b

- Req 6b: List the wildlife species in your state that are classified as endangered, threatened, exotic, non-native, game species, furbearers, or migratory game birds. Discuss with your counselor management practices in place or being developed for at least three of these species.

**Classwork:** 1, 2, 3, 4, 5c, 7c, 8

**Day 1:**

- Take attendance and introduce yourself as their instructor.
- Assign and explain homework.
- Req 1: Describe the meaning and purpose of fish and wildlife conservation and management.
- Req 2: List and discuss at least three major problems that continue to threaten your state's fish and wildlife resources.
- Req 3: Describe some ways in which everyone can help with the fish and wildlife conservation effort.

**Day 2:**

- Take attendance and remind Scouts of the homework.
- Req 4: List and describe five major fish and wildlife management practices used by managers in your state.
- Req 5c: Develop and implement a fishery improvement project or a backyard wildlife habitat improvement project. Share the results with your counselor.
  - Police trails, build simple stick lean-to's, squirrel boxes.

**Day 3:**

- Take attendance and remind Scouts of the homework.
- Go fishing. Swing by Ashaway if you need poles and the 407 or TPDH for bait.

- Req 7a: Determine the age of five species of fish from scale samples or identify various age classes of one species in a lake and report the results.
- Mention that this is the last day before the class ends and to bring homework tomorrow.

**Day 4:**

- Take attendance.
- Check homework for completeness.
- Stay at the Nature Center and view fish scales under the microscope.
- Look at the wildlife in the room, talk about the conditions of how they are kept and maintained. Why do we only keep certain types of animals, etc.
- Req 8: Using resources found at the library and in periodicals, books, and the internet (with your parent's permission), learn about three different positions held by fisheries and/or wildlife professionals. Find out the education and training requirements for each position.

# Forestry

**Prerequisites:** N/A

**Homework:** 1

- Req 1: Prepare a field notebook, make a collection, and identify 15 species of trees, wild shrubs, or vines in a local forested area. Write a description in which you identify and discuss the following: (a) The characteristics of leaf, twig, cone, or fruiting bodies (b) The habitat in which these trees, shrubs, or vines are found (c) The important ways each tree, shrub, or vine is used by humans or wildlife and whether the species is native or was introduced to the area. If it is not native, explain whether it is considered invasive or potentially invasive.

**Classwork:** 2c, 3, 4, 5a, 6, 7, 8

**Day 1:**

- Take attendance and introduce yourself as their instructor.
- Assign and explain homework.
- Take the scouts on a Wild edibles hike starting at the KEEC ending at the Thrush Cove.
- Req 2c: Find and examine two types of animals, insect, or disease damage to trees. In the field notebook you prepared for requirement 1, identify the damage, explain how the damage was caused, and describe the effects of the damage on the trees. Photograph or sketch each example.

**Day 2:**

- Take attendance and remind Scouts of the homework.
- Req 3a: Describe the contributions forests make to: (1) Our economy in the form of products (2) Our social well-being, including recreation (3) Soil protection and increased fertility (4) Clean water (5) Clean air (carbon cycling, sequestration) (6) Wildlife habitat (7) Fisheries habitat (8) Threatened and endangered species of plants and animals.
- Req 3b: Tell which watershed or other sources your community relies on for its water supply.

- Req 7a: Describe the consequences to forests that result from FIVE of the following elements: wildfire, absence of fire, destructive insects, loss of pollinating insect population, tree diseases, air pollution, overgrazing, deer or other wildlife overpopulation, improper harvest, and urbanization.
  - Hike to the fire sign and the ranger shop to look at the danger level and the Smokey the Bear sign – Fire Fighting tools on the side of the ranger shop.
- Req 7b: Explain what can be done to reduce the consequences you discussed in 7a.
- Req 7c: Describe what you should do if you discover a forest fire and how a professional.

### **Day 3:**

- Take attendance and remind Scouts of the homework.
- Bring Yawgoog's Forestry plan to read and look at during class.
- Hike to the Christmas Tree Farm.
- Req 4: Describe what forest management means, including the following: (a) Multiple-use management (b) Sustainable Forest management (c) Even-aged and uneven-aged management and the silvicultural systems associated with each (d) Intermediate cuttings (e) The role of prescribed burning and related forest-management practices.
- Req 5a: Visit a managed public or private forest area with the manager or a forester who is familiar with it. Write a brief report describing the type of forest, the management objectives, and the forestry techniques used to achieve the objectives.
- Mention that this is the last day before the class ends and to bring the homework tomorrow.

### **Day 4:**

- Take attendance.
- Check homework for completeness.
- Hike around camp looking for danger trees.
- Req 6: In your camp, local recreation area (park or equivalent), or neighborhood, inventory the trees that may be a hazard to structures

or people. Make a list by area (campsite, road, trail, street, etc.). Note the species and hazardous condition and suggest a remedy (removal or trimming). Make your list available to the proper authority or agency.

- Req 8: Visit one or more local foresters and write a brief report about the person (or persons). Or write about a forester's occupation including the education, qualifications, career opportunities, and duties related to forestry.

# Geology

**Prerequisites:** N/A

**Homework:** 5C<sub>3b</sub>

- Req 5C<sub>3b</sub>: With your counselor's assistance, identify 15 different rocks and minerals. List the name of each specimen, tell whether it is a rock or mineral, and give the name of its class (if it is a rock) or list its identifying physical properties (if it is a mineral).

**Classwork:** 1, 2, 3, 4b, 5C<sub>1</sub>, 5C<sub>4</sub>, 5C<sub>4</sub>, 5C<sub>5b</sub>

**Day 1:**

- Take attendance introduce and yourself as their instructor.
- Assign and explain homework.
- Req 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.
- Req 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.

**Day 2:**

- Take attendance and remind Scouts of the homework.
- Bring any rock tools or testing materials with you for class.
- Go to the dam so that you can look at the quartz vein in the rock towards Don Dewing and then play the game in the field.
- Req 5C<sub>2</sub>: 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.
- Req 5C<sub>1</sub>: Define rock. Discuss the three classes of rocks including their origin and characteristics.
  - Play Rockity-Rock Rock Rock until the end of class.

**Day 3:**

- Take attendance and remind Scouts of the homework.
- Stay at the Nature Center for this class.

- Req 3: Review a geologic map of your area or an area selected by 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.
  - Look at the maps on the wall and some of the rocks in the bins.
- Req 4b: 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.
- Mention that this is the last day before the class ends and to bring the homework tomorrow.

#### **Day 4:**

- Take attendance.
- Check homework for completion.
- Hike down middle camp road (asphalt) to the Bucklin arch (cobble stone and granite) to the TPDH (concrete).
- Req 5c<sub>4</sub>: 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.
- Req 5c<sub>5b</sub>: 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.





# Nature

**Prerequisites:** N/A

**Homework:** 4g<sub>2</sub>, 4h<sub>2</sub>

- Req 4g<sub>2</sub>: Collect and label the seeds of six plants OR the leaves of 12 plants.
- Req 4h<sub>2</sub>: Collect and identify five different types of rocks from your area.

**Classwork:** 1, 2, 3, 4b, 4c, 4d, 4e, 4g<sub>1</sub>, 4h<sub>1</sub>

## Day 1:

- Take attendance introduce and yourself as their instructor.
- Assign and explain homework.
- Req 4b<sub>1</sub>: In the field, identify three species of wild mammals and explain their habitat.
  - Continue to identify animals throughout the week as you hike around.
- Req 1: Name three ways in which plants are important to animals. Name a plant that is protected in your state or region and explain why it is at risk.
- Req 2: Name three ways in which animals are important to plants. Name an animal that is protected in your state or region and explain why it is at risk.

## Day 2:

- Take attendance and remind Scouts of the homework.
- Req 3: Explain the term “food chain.” Give an example of a four-step land food chain and a four-step water food chain.

## Day 3:

- Take attendance and remind Scouts of the homework.
- Go on a Wild Edibles hike starting at the Nature Center ending at Thrush Cove.
  - Req 4g<sub>1</sub>: In the field, identify 15 species of wild plants.
- Hike to the back of the J. Harold Williams Amphitheater to view the soil layers behind the stage.

- Req 4h<sub>1</sub>: Collect and identify soils found in different layers of a soil profile.
- Mention that this is the last day before the class ends and to bring the homework tomorrow.

**Day 4:**

- Take attendance.
- Check homework for completion.
- Stay at the Nature Center for this class.
- Req 4c: Show that you can recognize the venomous snakes in your area. In the field, identify three species of reptiles or amphibians. Recognize one species of toad or frog by voice.
  - Look at the snakes, toads, frogs, etc. in the tanks at the time.
  - Play sounds over the Nature Center TV.
- Req 4b<sub>2</sub>: Make plaster casts of the tracks of a wild mammal.
  - Use the plaster cast in the Nature center and clay to mimic the prints of animals.
- Req 4e: Identify two species of fish native to your area. Collect four kinds of animal food eaten by fish in the wild.
  - Look at the fish in the tanks and what they get fed and eat.

# Oceanography

**Prerequisites:** N/A

**Homework:** 4, 8c

- Req 4: Draw a cross-section of underwater topography. Show what is meant by: a. Continental shelf b. Continental slope c. Abyssal plain Name and put on your drawing the following: seamount, guyot, rift valley, canyon, trench, and oceanic ridge. Compare the depths in the oceans with the heights of mountains on land.
- Req 8c: Explain to your troop in a five-minute prepared speech “Why Oceanography Is Important” or describe “Career Opportunities in Oceanography.” (Before making your speech, show your speech outline to your counselor for approval.)

**Classwork:** 1, 2, 3, 5, 6, 7b, 9

**Day 1:**

- Take attendance introduce and yourself as their instructor.
- Assign and explain homework.
- Req 1: Name four branches of oceanography. Describe at least five reasons why it is important for people to learn about the oceans.
- Req 2: Define salinity, temperature, and density, and describe how these important properties of seawater are measured by the physical oceanographer. Discuss the circulation and currents of the ocean. Describe the effects of the oceans on weather and climate.

**Day 2:**

- Take attendance and remind Scouts of the homework.
- Req 3: Describe the characteristics of ocean waves. Point out the differences among the storm surge, tsunami, tidal wave, and tidal bore. Explain the difference between sea, swell, and surf. Explain how breakers are formed.
- Req 5: List the main salts, gases, and nutrients in seawater. Describe some important properties of water. Tell how the animals and plants of the ocean affect the chemical composition of seawater. Explain how differences in evaporation and precipitation affect the salt content of the oceans.

- Req 6: Describe some of the biologically important properties of seawater. Define benthos, nekton, and plankton. Name some of the plants and animals that make up each of these groups. Describe the place and importance of phytoplankton in the oceanic food chain.

### **Day 3:**

- Take attendance and remind Scouts of the homework.
- Stay at the Nature Center for this class.
- Req 7b: Make a series of models (clay or plaster and wood) of a volcanic island. Show the growth of an atoll from a fringing reef through a barrier reef. Describe the Darwinian theory of coral reef formation.
- Req 9: Describe four methods that marine scientists use to investigate the ocean, underlying geology, and organisms living in the water.
- Mention that this is the last day before the class ends and to bring the homework tomorrow.
- Tell Scouts to wear a bathing suit and bring their swim tag to the next class so you can go to the TPWF non-swimmer section to make waves.

### **Day 4:**

- Take attendance.
- Check homework for completion.
- Go to the TPWF non-swimmer section to make waves.
- Talk about the parts of waves.
- Use the sand under water to make different geographic formations.

# Reptile and Amphibian Study

**Prerequisites:** 8a or 8b

- Req 8a: Maintain one or more reptiles or amphibians for at least a month. Record food accepted, eating methods, changes in coloration, shedding of skins, and general habits; or keep the eggs of a reptile from the time of laying until hatching; or keep the eggs of an amphibian from the time of laying until their transformation into tadpoles (frogs) or larvae (salamanders).
- Req 8b: Choose a reptile or amphibian that you can observe at a local zoo, aquarium, nature center, or other such exhibit (such as your classroom or school). Study the specimen weekly for a period of three months. At each visit, sketch the specimen in its captive habitat and note any changes in its coloration, shedding of skin, and general habits and behavior. Discuss with your counselor how the animal you observed was cared for to include its housing and habitat, how the lighting, temperature, and humidity were maintained, and any veterinary care requirements. Find out, either from information you locate on your own or by talking to the caretaker, what this species eats and what are its native habitat and home range, preferred climate, average life expectancy, and natural predators. Also identify any human-caused threats to its population and any laws that protect the species and its habitat. After the observation period, share what you have learned with your counselor.

**Homework:** 1

- Req 1: Describe the identifying characteristics of six species of reptiles and four species of amphibians found in the United States. For any four of these, make sketches from your own observations or take photographs. Show markings, color patterns, or other characteristics that are important in the identification of each of the four species. Discuss the habits and habitats of all 10 species.

**Classwork:** 2, 3, 4, 5, 6, 7, 9b, 9c, 10

**Day 1:**

- Take attendance introduce and yourself as their instructor.

- Assign and explain homework.
- Req 2: Discuss with your merit badge counselor the approximate number of species and general geographic distribution of reptiles and amphibians in the United States. Prepare a list of the most common species found in your local area or state.
- Req 10: Tell five superstitions or false beliefs about reptiles and amphibians and give a correct explanation for each. Give seven examples of unusual behavior or other true facts about reptiles and amphibians.
- Req 3: Describe the main differences between (a) Amphibians and reptiles (b) Alligators and crocodiles (c) Toads and frogs (d) Salamanders and lizards (e) Snakes and lizards.

### **Day 2:**

- Take attendance and remind Scouts of the homework.
- Req 4: Explain how reptiles and amphibians are an important component of the natural environment. List four species that are officially protected by the federal government or by the state you live in and tell why each is protected. List three species of reptiles and three species of amphibians found in your local area that are not protected. Discuss the food habits of all 10 species.
- Req 5: Describe how reptiles and amphibians reproduce.
- Req 7: Describe in detail six venomous snakes and the one venomous lizard found in the United States. Describe their habits and geographic range. Tell what you should do in case of a bite by a venomous species.

### **Day 3:**

- Take attendance and remind Scouts of the homework.
- Take nets, buckets, bins, gloves, hooks, and anything else and go herping on the swamp trail, Thrush Cove, Ashaway board walk, water way between the dam and Wincheck pond.
- Show safe ways to handle the animals and bring them to the nature center to discuss tomorrow.
  - Let them name the animals and show them how we keep them safe in their habitats.

- Mention that this is the last day before the class ends and to bring the homework tomorrow.

**Day 4:**

- Take attendance.
- Check homework for completion.
- Stay in the Nature Center today.
- Req 9b: Identify by sight eight species of reptiles or amphibians.
  - Walk around to the tanks or use the posters.
- Req 9c: Using visual aids, give a brief talk to a small group on three different reptiles and amphibians.
  - Walk around to the tanks or use the posters.
- Req 6: From observation, describe how snakes move forward. Describe the functions of the muscles, ribs, and belly plates.

# Soil and Water Conservation

**Prerequisites:** N/A

**Homework:** 2d, 3c, 5a, 6d

- Req 2d: Take pictures or draw two kinds of soil erosion.
- Req 3c: Take pictures or draw three kinds of erosion-control practices.
- Req 5a: Make a drawing to show the hydrologic cycle.
- Req 6d: Make a drawing showing the principles of complete waste treatment.

**Classwork:** 1, 2a, 2b, 2c, 3a, 3b, 4, 5b, 5c, 5d, 5e, 6a, 6b, 6c, 7d, 7e

**Day 1:**

- Take attendance introduce and yourself as their instructor.
- Assign and explain homework.
- Req 4: (a) Explain what a watershed is. (b) Outline the smallest watershed that you can find on a contour map. (c) Then outline on your map, as far as possible, the next larger watershed which also has the smallest 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.

**Day 2:**

- Take attendance and remind Scouts of the homework.
- Go to the Three Point Amphitheater
- Req 1: (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.
- Req 2: (a) Define soil erosion. (b) Tell why it is important. Tell how it affects you. (c) Name three kinds of soil erosion. Describe each.
  - Look at the erosion by the TPWF spicket at the amphitheater.
- Req 3a: Tell what is meant by “conservation practices.” Describe the effect of three kinds of erosion-control practices.



- Look at the log in the ground going to staff beach and how it helps erosion.
- Go into the TPWF with visitors tags and rake the beach and talk about erosion.
- Demonstrate by dumping water for fun.
- Req 3b: Describe the effect of three kinds of erosion-control practices.

### **Day 3:**

- Take attendance and remind Scouts of the homework.
- Req 5: (b) Show by demonstration at least two of the following actions of water in relation to 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.
- Req 6: (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.”
  - Walk to the pumphouse and talk about the water treatment.
- Mention that this is the last day before the class ends and to bring the homework tomorrow.

### **Day 4:**

- Take attendance.
- Check homework for completion.
- Stay at the Nature Center today.
- Req 7d: Study a soil survey report. Describe the things in it. On tracing paper over any of the soil maps, outline an area with three or more different kinds of soil. List each kind of soil by full name and map symbol.
- Req 7e: Make a list of places in your neighborhood, camps, school ground, or park that have erosion, sedimentation, or pollution problems. Describe how these could be corrected through individual or group action.

# Sustainability

## Prerequisites: 2

- Water. Do ONE of the following and discuss with your counselor:
  - (a) Evaluate your household water usage. If available, review water bills from the past year and evaluate the seasonal changes in water use. Identify three ways to help reduce water consumption.
  - (b) Explain why water is necessary in our lives. Create a diagram to show how your household gets its clean water from a natural source and what happens with the water after you use it. Tell two ways to preserve your community's access to clean water in the future.
  - (c) Different areas of the world are affected by either too much (flooding) or too little (drought) water. Explore whether either or both affects where you live. Identify three water conservation or flood mitigation practices (successful or unsuccessful) that have been tried where you live or in an area of the world that interests you.

## Homework: 4b, 6b, 8a, 8c

- Req 4b: Identify one unsustainable practice in your community and develop a written plan to fix it.
- Req 6b: List five ways having too much “stuff” affects you, your family, your community, AND the world. For each of the five ways, consider the following aspects: the financial impact, time spent, maintenance, health, storage, and waste generation. Identify practices that can be used to avoid accumulating too much “stuff.”
- Req 8a: On a camp out or other outdoor Scouting activity that you attend, make notes on the sustainability practices you and your fellow Scouts practice. Observe transportation, forestry, soil conservation, water resources, habitat, buildings, campsites, and sanitation. Share what you observed and learned with your counselor.
- Req 8c: Identify 5 behavioral changes that you and your family can make to improve the sustainability of your household. Share and discuss each with your counselor.

**Classwork:** 1, 3b, 5a, 5c, 7d, 7e, 8b, 9

**Day 1:**

- Take attendance introduce and yourself as their instructor.
- Assign and explain homework.
- Req 1: Describe the meaning of sustainability in your own words. Explain the importance of sustainability to society and how you can contribute to fulfilling the needs of current generations without compromising the needs of future generations.
- Req 8b: Discuss with your counselor how living by the Scout Oath, Scout Law, and Outdoor Code in your daily life helps promote sustainability.

**Day 2:**

- Take attendance and remind Scouts of the homework.
- Req 3b: Identify four factors that limit the availability of food in different regions of the world. Discuss how each factor influences the sustainability of worldwide food supplies. Share three ways individuals, families, or your community can create their own food sources.
- Req 5a: Learn about the sustainability of different energy sources, including coal, gas, geothermal, hydro power, nuclear, petroleum, solar, and wind. Identify three common energy sources in the United States and describe how the production and consumption of each of these energy sources affects sustainability.
- Req 5c: List five ways you and your family could reduce energy consumption in your home, such as adjusting your thermostat, window shades, opening windows, reducing hot-water temperature, and minimizing water consumption. Identify the benefits and risks of each idea and implement them if possible.

**Day 3:**

- Take attendance and remind Scouts of the homework.
- Stay at the Nature Center today.
- Req 7d: Learn how the world's population affects the sustainability of Earth. Discuss three human activities that may contribute to putting Earth at risk, now and in the future.

- Req 7e: Explain the term species (plant or animal) decline. Share the human activities that contribute to species decline, what can be done to help reverse the decline, and its impact on a sustainable environment.
  - Look at the endangered species posters, look at the animal habitat displays and talk about how they can be damaged and what can be done to protect them.
- If you finish early today, work in the Nature Center with Scouts on their homework – remind them that tomorrow is the last class, and they need to bring all of it with them.

**Day 4:**

- Take attendance.
- Have each Scout share their homework and the prerequisite they completed.
  - Allow discussion and feedback from other Scouts.
- Req 9: Learn about career opportunities in the sustainability field. Pick one and find out the education, training, and experience required. Discuss what you have learned with your counselor and explain why this career might interest you.

# Weather

## Prerequisites: 9a

- Make one of the following instruments: wind vane, anemometer, rain gauge, hygrometer. Keep a daily weather log for one week using information from this instrument as well as from other sources such as local radio and television stations, NOAA Weather Radio All Hazards, and Internet sources (with your parent or guardian's permission). Record the following information at the same time every day: wind direction and speed, temperature, precipitation, and types of clouds. Be sure to make a note of any morning dew or frost. In the log, also list the weather forecasts from radio or television at the same time each day and show how the weather really turned out.

## Homework: 6, 10

- Req 6: Draw a diagram of the water cycle and label its major processes. Explain the water cycle to your counselor.
- Req 10: Give a talk of at least five minutes to a group (such as your unit or a Cub Scout pack) explaining the outdoor safety rules in the event of lightning, flash floods, and tornadoes. Before your talk, share your outline with your counselor for approval.

## Classwork: 1, 2, 3, 4, 5, 7, 8, 11

### Day 1:

- Take attendance introduce and yourself as their instructor.
- Assign and explain homework.
- Check and discuss the weather station before you leave the nature center.
- Req 1: Define meteorology. Explain what weather is and what climate is. Discuss how the weather affects farmers, sailors, aviators, and the outdoor construction industry. Tell why weather forecasts are important to each of these groups.
- Req 11: Find out about a weather-related career opportunity that interests you. Discuss with and explain to your counselor what training and education are required for such a position, and the responsibilities required of such a position.

## Day 2:

- Take attendance and remind Scouts of the homework.
- Check and discuss the weather station before you leave the nature center.
- Req 2: Name five dangerous weather-related conditions. Give the safety rules for each when outdoors and explain the difference between a severe weather watch and a warning. Discuss the safety rules with your family.
- Req 4: Tell what causes wind, why it rains, and how lightning and hail are formed.
- Req 7: Identify some human activities that can alter the environment and describe how they affect the climate and people.

## Day 3:

- Take attendance and remind Scouts of the homework.
- Check and discuss the weather station before you leave the nature center.
- Hike to a quiet field with low amounts of tree cover.
- Req 3: Explain the difference between high- and low-pressure systems in the atmosphere. Tell which is related too good and too poor weather. Draw cross sections of a cold front and a warm front, showing the location and movements of the cold and warm air, the frontal slope, the location, and types of clouds associated with each type of front, and the location of precipitation.
- Req 5: Identify and describe clouds in the low, middle, and upper levels of the atmosphere. Relate these to specific types of weather.
- Go cloud watching, identify what you see.
- Play Cloudidy-cloud-cloud-cloud.
- Mention that this is the last day before the class ends and to bring the homework tomorrow.

## Day 4:

- Take attendance.
- Check homework for completion.
- Have Scouts share what they did for the prerequisite, what weather instrument they made. How well did it work, what did it record, show

the picture of it to the class or share the records that they kept from the instrument.

- Req 8: Describe how the tilt of Earth's axis helps determine the climate of a region near the equator, near the poles, and across the area in between.