PLANT SCIENCE MERIT BADGE WORKBOOK

This Scoutmaster Bucky Merit Badge Workbook is based off the current *Scouts BSA Requirements*.

Consider also using the Plant Science merit badge class preparation page for clarification and expections when participating in a Scoutmaster Bucky merit badge opportunity (online or in-person).

https://scoutmasterbucky.com/merit-badges/plant-science/

Scout's Name:

Option 3: Field Botany

This workbook covers only one of the options for this merit badge. Check the Scoutmaster Bucky website for the other possibilities.

REQUIREMENT 1: Make a drawing and identify five or more parts of a flowering plant. Tell what each part does.

REQUIREMENT 2: Explain photosynthesis and tell why this process is important. Tell at least five ways that humans depend on plants.

REQUIREMENT 3: Explain how honeybees and other pollinating insects are important to plant life.

REQUIREMENT 4: Explain how water, light, air, temperature, and pests affect plants. Describe the nature and function of soil and explain its importance. Tell about the texture, structure, and composition of fertile soil. Tell how soil may be improved.

REQUIREMENT 5: Tell how to propagate plants by seeds, roots, cuttings, tubers, and grafting. Grow a plant by ONE of these methods.

REQUIREMENT 6: List by common name at least 10 native plants and 10 cultivated plants that grow near your home. List five invasive nonnative plants in your area and tell how they may be harmful. Tell how the spread of invasive plants may be avoided or controlled in ways that are not damaging to humans, wildlife, and the environment.

10 native plants

10 cultivated plants

Five invasive nonnative plants

How the spread of invasive plants may be avoided or controlled

REQUIREMENT 7: Name and tell about careers in agronomy, horticulture, and botany. Write a paragraph about a career in one of these fields that interests you.

REQUIREMENT 8: Choose ONE of the following options and complete each requirement:

Option 3: Field Botany

REQUIREMENT A: Visit a park, forest, Scout camp, or other natural area near your home. While you are there:

REQUIREMENT 1: Determine which species of plants are the largest and which are the most abundant. Note whether they cast shade on other plants.

REQUIREMENT 2: Using information from maps, textbooks, or the internet, describe the environmental factors that may influence the presence of plants on your site, including latitude, climate, air and soil temperature, soil type and pH, geology, hydrology, and topography.

REQUIREMENT 3: Record any differences in the types of plants you see at the edge of a forest, near water, in burned areas, or near a road or railroad.

REQUIREMENT B: Select a study site that is at least 100 by 100 feet. Make a list of 10 woody plants (trees and shrubs) and 10 non-woody plants in the study site. Find out which of these are native plants and which are exotic (or nonnative).

Canopy trees

Small trees

Shrubs

Herbaceous wildflowers and grasses

Vines

Ferns

Mosses

Algae

Fungi

Lichens

REQUIREMENT C: Tell how an identification key works and use a simple key to identify 10 kinds of plants (in addition to those in general requirement 5 above). Tell the difference between common and scientific names and tell why scientific names are important.

REQUIREMENT D: After gaining permission, collect, identify, press, mount, and label 10 different plants that are common in your area. Tell why voucher specimens are important for documentation of a field botanist's discoveries.

REQUIREMENT E: Obtain a list of rare plants of your state. Tell what is being done to protect rare plants and natural areas in your state. Write a paragraph about one of the rare plants in your state.

REQUIREMENT F: Choose ONE of the following alternatives and complete EACH of its requirements:

REQUIREMENT 1: Tree Inventory

REQUIREMENT A: Identify the trees of your neighborhood, a park, a section of your town, or a Scout camp.

REQUIREMENT B: Collect, press, and label leaves, flowers, or fruits to document your inventory.

☐ Completed

REQUIREMENT C: List the types of trees by scientific name and give common names. Note the number and size (diameter at 4 feet above ground) of trees observed and determine the largest of each species in your study area.

REQUIREMENT D: Show two or more people how to use a leaf or twig key to identify at least five species of trees or shrubs.

REQUIREMENT 2: Transect Study

REQUIREMENT A: Visit two sites, at least one of which is different from the one you visited for Field Botany requirement 1.

First location description	Second location description

REQUIREMENT B: Use the transect method to study the two different kinds of plant communities. The transects should be at least 500 feet long.

First location

Second location

REQUIREMENT C: At each site, record observations about the soil and other influencing factors AND do the following. Then make a graph or chart to show the results of your studies.

First location

Second location

1. Identify each tree within 10 feet of the transect line.
2. Measure the diameter of each tree at 4 feet above the ground, and map and list each tree.

First location	Second location

REQUIREMENT 3: Nested Plot

REQUIREMENT A: Visit two sites, at least one of which is different from the one you visited for Field Botany requirement 1.

First location description	Second location description

REQUIREMENT B: Mark off nested plots and inventory two different kinds of plant communities.

REQUIREMENT C: At each site, record observations about the soil and other influencing factors AND do the following. Then make a graph or chart to show the results of your studies.

First location

Second location

1. Identify, measure, and map each tree in a 100-by-100-foot plot. (Measure the diameter of each tree larger than 3 inches in diameter at 4 feet above the ground.)
2. Identify and count all trees and shrubs in a 10-by-10-foot plot within each of the larger areas.
3. Identify and count all broad-leaved plants (trees, shrubs, vines, and herbaceous plants) all plants (wildflowers, ferns, grasses, mosses, etc.) of a 4-by-4-foot plot within the 10-by-10-foot plot.

First location	Second location

REQUIREMENT 4: Herbarium Visit

REQUIREMENT A: Write ahead and arrange to visit an herbarium at a university, park, or botanical garden; OR, visit an herbarium website (with your parent's permission).

☐ Visited herbarium

REQUIREMENT B: Tell how the specimens are arranged and how they are used by researchers. If possible, observe voucher specimens of a plant that is rare in your state.

REQUIREMENT C: Tell how a voucher specimen is mounted and prepared for permanent storage. Tell how specimens should be handled so that they will not be damaged.

REQUIREMENT D: Tell about the tools and references used by botanists in an herbarium.

REQUIREMENT 5: Plant Conservation Organization Visit

REQUIREMENT A: Write ahead and arrange to visit a private conservation organization or government agency that is concerned with protecting rare plants and natural areas.

☐ Completed

REQUIREMENT B: Tell about the activities of the organization in studying and protecting rare plants and natural areas. If possible, visit a nature preserve managed by the organization.

REQUIREMENT C: Tell about land management activities such as controlled burning, or measures to eradicate invasive (nonnative) plants or other threats to the plants that are native to the area.