

Plant Science

Merit Badge Workbook

Merit badges are earned by doing: reading the pamphlet, practicing the skills, and showing your counselor what you have learned.
This workbook gives you a place to organize your notes and track your progress along the way.
Merit badge counselors may not require the use of this or any similar workbook.
You still must satisfy your counselor that you can demonstrate each skill and have learned the information.
Use the space under each requirement to note what you have done and what you want to talk about, not to write out full answers.
When a requirement says discuss, show, tell, explain, or demonstrate, that is what you must do.
No one may add to or subtract from the official requirements found on scouting.org (Guide to Advancement 7.0.4.8).
Scouting America last updated this badge's requirements page on December 31, 2025.
Requirements change from time to time. Double-check scouting.org before you start.

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Scout's name: _____ Unit: _____ Date started: _____

Counselor's name: _____ Phone no.: _____ Email: _____

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This workbook is unofficial and not endorsed by Scouting America.

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

Scouting America resources: Flower Dissection - Reproduction in Flowering Plants (video) · Flower Structures and Functions (video)

My drawing of a flowering plant, with parts labeled (draw here or attach)

Parts of a flowering plant

Part	What it does

Requirement 1 completed on _____ counselor initials _____

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

Scouting America resources: Photosynthesis and Cellular Respiration: (video)
Photosynthesis Light Reactions and the Calvin Cycle (video) · Photosynthesis (website)

Photosynthesis in my own words

Why this process is important

Five ways humans depend on plants

#	Way humans depend on plants
1	
2	
3	
4	
5	

Requirement 2 completed on _____ counselor initials _____

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

Scouting America resources: Animal Pollinators Other Than Bees (video) · How do Bees Make Our Food? (video)
Honeybees and Agriculture (video)

How honeybees and other pollinating insects help plant life

Requirement 3 completed on _____ counselor initials _____

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.

Scouting America resources: Learn the Various Factors That Affect Roots (video) · How Plants Grow (video)
Soil and Soil Dynamics (video) · Types of Soil (video)

What affects plants

Factor	How it affects plants
Water	
Light	
Air	
Temperature	
Pests	

The nature and function of soil, and why it is important

Fertile soil

Feature	What fertile soil is like
Texture	
Structure	
Composition	

How soil may be improved

Requirement 4 completed on _____ counselor initials _____

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

Scouting America resources: How to Propagate Plants (video) · How to Propagate Any Plant | Multiply Your Plants for Free! (video)

Ways to propagate plants

Method	How to do it
Seeds	
Roots	
Cuttings	
Tubers	
Grafting	

Method I used _____ Plant _____ Date started _____

How my plant grew

Requirement 5 completed on _____ counselor initials _____

6. List by common name at least 10 native plants and 10 cultivated plants that grow near your home. List five invasive non-native 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.

Scouting America resources: Getting Rid of Invasive Plants From Your Yard. Don't Plant These! (video)
How To Identify and Remove Invasive Plants (video)
How To Select Native Plants For Your Landscape: Determining Your Site Conditions (video)

Plants that grow near my home (common names)

#	Native plant	Cultivated plant
1		
2		
3		
4		

Plants that grow near my home (common names) (continued)

#	Native plant	Cultivated plant
5		
6		
7		
8		
9		
10		

Five invasive non-native plants in my area

Plant	How it may be harmful

How their spread may be avoided or controlled without harming humans, wildlife, or the environment

Requirement 6 completed on _____ counselor initials _____

7. Do ONE of the following:

☐ **(a)** Explore careers related to this merit badge. Research one career to learn about the training and education needed, costs, job prospects, salary, job duties, and career advancement. Your research methods may include—with your parent or guardian's permission—an internet or library search, an interview with a professional in the field, or a visit to a location where people in this career work. Discuss with your counselor both your findings and what about this profession might make it an interesting career.

Scouting America resources: A Day in the LIFE of an AGRONOMIST (video)
10 Botany Jobs: Environmental Conservation Botany Jobs and Environmental Internships (video)

Careers related to plant science

Career	What people in it do

The career I researched

What I found out

Topic	My findings
Training and education	
Costs	
Job prospects	
Salary	
Job duties	
Career advancement	

What might make it an interesting career

☐ **(b)** Explore how you could use knowledge and skills from this merit badge to pursue a hobby or healthy lifestyle. Research any training needed, expenses, and organizations that promote or support it. Discuss with your counselor what short-term and long-term goals you might have if you pursued this.

Scouting America resources: Fairy Gardens (video) · Bonzai Tree Hobby (video)
Common Reasons for Keeping Honey Bees (video)

My hobby or healthy lifestyle idea

What I found out

Topic	My findings
Training needed	
Expenses	
Organizations	

My short-term and long-term goals

Requirement 7 completed on counselor initials

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

☐ **Option A—Agronomy. Do ALL of the following:**

(1) Describe how to prepare a seedbed.

Scouting America resources: How To Prepare Your Seedbed For Spring Planting (video)
Plan Your Best Garden Ever: Testing Soil and Seeds (website)

How to prepare a seedbed

(2) Make and use a seed germination tester to test 50 seeds of four of the following plants: corn, cotton, alfalfa, soybeans, clover, wheat, rice, rye, or barley. Determine the percentage of live seeds.

Scouting America resources: How to Do Seed Germination Test (video)

Date I started the test _____ Date I counted the results _____

My seed germination test

Plant	Seeds tested	Seeds that sprouted	Percentage of live seeds

(3) Explain one important insect pest and one important disease that damage each of the following: corn, small grains, and cotton. Collect and name five weeds that compete with crops in your locality. Tell how to control these weeds without harming people, wildlife, or useful insects.

Scouting America resources: Different Types of Diseases in Corn (video) · Major Pest of Cotton (video)

Pests and diseases that damage crops

Crop	One important insect pest	One important disease
Corn		
Small grains		
Cotton		

Five weeds that compete with crops in my area

#	Weed I collected and named
1	
2	
3	
4	
5	

How to control these weeds without harming people, wildlife, or useful insects

(4) On a map of the United States, identify the chief regions where corn, cotton, forage crops, small grain crops, and oil crops grow. Tell how the climate and location of these regions make them leaders in the production of these crops.

Scouting America resources: Major Crops of United States (video) · Major Agricultural Crops in United States (video)
USDA - National Agricultural Statistics Service - Charts and Maps - Field Crops (website)

Chief growing regions

Crop	Chief regions	How climate and location help
Corn		
Cotton		
Forage crops		
Small grain crops		
Oil crops		

☐ My marked map of the United States is attached

(5) Do ALL of the requirements in ONE of the following alternatives:

☐ **(a)** Corn

(1) Grow a plot of corn and have your plot inspected by your counselor. Record seed variety or experimental code number.

Scouting America resources: The Incredible Logistics Behind Corn Farming (video)

Seed variety or experimental code number _____ Date planted _____

Date my counselor inspected my plot _____

(2) Tell about modern methods of commercial corn farming and the contributions that corn makes to today's food and fuel supply.

Modern methods of commercial corn farming

What corn adds to today's food and fuel supply

(3) Tell about an insect that can damage corn, and explain how it affects corn production and how it is controlled.

Scouting America resources: Different Types of Diseases in Corn (video)

Insect that can damage corn _____

How it affects corn production, and how it is controlled

☐ **(b)** Cotton

(1) Grow a plot of cotton and have your plot inspected by your counselor.

Date planted _____ Date my counselor inspected my plot _____

(2) Tell about modern methods of commercial cotton farming, and about the uses of cotton fiber and seed and the economic value of this crop.

Scouting America resources: How American Farmers Produce 14.68 Million Bales Of Cotton - American Farming (video)

Topic	What I found out
Modern methods of commercial cotton farming	
Uses of cotton fiber	
Uses of cotton seed	
Economic value of cotton	

(3) Tell about an insect that can damage cotton, and explain how it affects cotton production and how it is controlled.

Scouting America resources: Major Pest of Cotton (video) · Insect Lockdown Pest Profiles: The Cotton Fleahopper (video)

Insect that can damage cotton

How it affects cotton production, and how it is controlled

☐ **(c)** Forage Crops

(1) Collect, count, and label samples of each for display: perennial grasses, annual grasses, legumes, and broadleaf weeds. Indicate how each grass and legume is used. Keep a log of the site where you found each sample and share it with your counselor.

My forage sample log

Type	Samples I collected and labeled	How many	Where I found them	How it is used
Perennial grasses				
Annual grasses				
Legumes				
Broadleaf weeds				

Date I shared my log with my counselor

(2) Explain how legumes can be used to enrich the soil and how they may deplete it under certain conditions. Explain how livestock may enrich or deplete the soil.

Scouting America resources: Importance of Legumes (video)
The Science of Soil Health: Understanding the Value of Legumes and Nitrogen-Fixing Microbes (video)

	How it can enrich the soil	How it can deplete the soil
Legumes		
Livestock		

(3) Name five poisonous plants that are dangerous to livestock, and tell the different ways of using forage crops as feed for livestock.

Scouting America resources: Local Veterinarian Explains What Plants Are Toxic to Large Animals (video)

Five plants that are dangerous to livestock

#	Poisonous plant	Why it is dangerous to livestock
1		
2		
3		
4		
5		

☐ **(d)** Small Grains

(1) Give production figures for small grain crops listed in the U.S. Statistical Report or Agricultural Statistics Handbook for the latest year available.

Scouting America resources: USDA - National Agricultural Statistics Service - Charts and Maps - Field Crops (website)

Report I used _____ Year _____

Small grain crop	Production figures

(2) Help in harvesting a crop of grain. Tell how to reduce harvesting losses and about modern methods of growing one small grain crop.

Scouting America resources: Growing and Harvesting Wheat on a Small Scale (video)
Reducing Soybean Harvest Losses | Michigan Soybean | Harvest Demonstration (video)

Grain crop I helped harvest _____ Where _____ Date _____

How to reduce harvesting losses

The small grain crop I picked, and modern methods of growing it

(3) Visit a grain elevator, flour mill, cereal plant, feed or seed company. Talk with the operator. Take notes, and describe the processes used and tell your patrol, troop, or class about your visit.

Scouting America resources: The Journey: Wheat into Flour (video)
Everything About Grain Bins (Farmers are Geniuses) (video) · How Does a Seed Company Work? (video)

Place I visited | Operator I talked with | Date

My notes: the processes used there

Who I told about my visit (patrol, troop, or class) | Date

☐ **(e)** Oil Crops

(1) Grow a plot of soybeans and have your plot inspected by your counselor.

Scouting America resources: How to Produce Millions Of Tons Of Soybeans | Modern Agricultural Technology | Soy milk Processing (video)

Date planted | Date my counselor inspected my plot

(2) Tell about modern methods of growing soybeans on a commercial scale, and discuss the contributions soybeans make to our food supply.

Scouting America resources: Soybeans and Oil Crops - Oil Crops Sector at a Glance | Economic Research Service (website)

Modern methods of growing soybeans on a commercial scale

What soybeans add to our food supply

(3) Explain why a hard frost can be dangerous to soybeans just after emergence.

Scouting America resources: Soybean School: Assessing the Impact of Frost (video)

Why a hard frost can be dangerous to soybeans just after emergence

☐ **Option B—Horticulture. Do ALL of the following:**

(1) Visit one of the following places and tell what you learned about horticulture there: public garden, arboretum, retail nursery, wholesale nursery, production greenhouse, or conservatory greenhouse.

Scouting America resources: Horticulture Center Tour (video)

Place I visited | Date

What I learned about horticulture there

(2) Explain the following terms: hardiness zone, shade tolerance, pH, moisture requirement, native habitat, texture, cultivar, ultimate size, disease resistance, habit, evergreen, deciduous, annual, and perennial. Find out what hardiness zone you live in and list 10 landscape plants you like that are suitable for your climate, giving the common name and scientific name for each.

Scouting America resources: US Plant Zones: Explained // Garden Answer (video) · Glossary - Grow Native! (website)
USDA Plant Hardiness Zone Map (website)

Horticulture terms

Term	What it means
Hardiness zone	
Shade tolerance	
pH	
Moisture requirement	
Native habitat	
Texture	
Cultivar	
Ultimate size	
Disease resistance	
Habit	
Evergreen	
Deciduous	
Annual	
Perennial	

My hardiness zone

10 landscape plants I like that suit my climate

#	Common name	Scientific name
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

(3) Do ONE of the following:

☐ **(a)** Explain the difference between vegetative and sexual propagation methods, and tell some horticultural advantages of each. Grow a plant from a stem or root cutting or graft.

Scouting America resources: How to Propagate Plants: 4 Methods to Master (video)
Vegetative Propagation-Asexual Reproduction in Plants-Leaving Cert Biology (video)
Propagation Techniques for Prolific Plants - Growing Spaces Greenhouses (video)

The difference between vegetative and sexual propagation

Method	Horticultural advantages
Vegetative	
Sexual	

Plant I grew _____ Cutting or graft _____ Date _____

☐ **(b)** Transplant 12 seedlings or rooted cuttings to larger containers and grow them for at least one month.

Scouting America resources: How to Transplant Seedlings to Bigger Pots (video)

What I transplanted _____ Date transplanted _____ One month later _____

How they grew

☐ **(c)** Demonstrate good pruning techniques and tell why pruning is important.

Scouting America resources: Everything You Need to Know to Start Pruning | Gardening 101 (video)

What I pruned _____ Who I showed _____ Date _____

Why pruning is important

☐ **(d)** After obtaining permission, plant a tree or shrub properly in an appropriate site.

Scouting America resources: How to Properly Plant a Tree (video)

Tree or shrub I planted _____ Permission from _____ Date _____

Where I planted it _____

(4) Do the following:

(a) Explain the importance of good landscape design and selection of plants that are suitable for particular sites and conditions.

Scouting America resources: How to Pick the Right Plants for Stunning Landscaping - A Botanical Bliss Guide (video)

Why good landscape design and the right plants for each site matter

(b) Tell why it is important to know how big a plant will grow.

Scouting America resources: How to Know the Height, Width & Size a Plant or Tree Will Grow to at Maturity (website)

Why it is important to know how big a plant will grow

(c) Tell why slower-growing landscape plants are sometimes a better choice than faster-growing varieties.

Scouting America resources: Choosing Slow-Growing Plants for Greater Longevity (website)

Why slower-growing plants are sometimes a better choice

(5) Do ALL of the requirements in ONE of the following alternatives:

☐ **(a)** Bedding Plants

(1) Grow bedding plants appropriate for your area in pots or flats from seed or cuttings in a manufactured soil mix. Explain why you chose the mix and tell what is in it.

Bedding plants I grew | Seed or cuttings | Date started

Why I chose my soil mix, and what is in it

(2) Transplant plants to a bed in the landscape and maintain the bed until the end of the growing season. Record your activities, observations, materials used, and costs.

Scouting America resources: Transplanting Ferns & Other Plants: A Guide to Success (video)

Date I transplanted to the bed | Where the bed is

My bed record through the growing season

Date	What I did	What I observed	Materials used	Cost

(3) Demonstrate mulching, fertilizing, watering, weeding, and deadheading, and tell how each practice helps your plants.

Scouting America resources: The Big Five - Weeding, Pruning, Fertilizing, Mulching, Watering (video)

Practice	Date I showed it	How it helps my plants
Mulching		
Fertilizing		
Watering		
Weeding		
Deadheading		

(4) Tell some differences between gardening with annuals and perennials.

Scouting America resources: The Difference Between Annuals and Perennials (video)
Annuals or Perennials? Which Is Best, and How Do I Choose? (video)

Some differences

Gardening with annuals	Gardening with perennials

☐ **(b)** Fruit, Berry, and Nut Crops

(1) Plant five fruit or nut trees, grapevines, or berry plants that are suited to your area. Take full care of fruit or nut trees, grapevines, or berry plants through one season.

What I planted

#	Fruit or nut tree, grapevine, or berry plant	Date planted
1		
2		
3		
4		
5		

My care log for the season

Date	Care I gave

(2) Prune a tree, vine, or shrub properly. Explain why pruning is necessary.

Scouting America resources: Why You Should Prune Your Shrubs and Trees (video)

Tree, vine, or shrub I pruned _____ Date _____

Why pruning is necessary

(3) Demonstrate one type of graft and tell why this method is useful.

Scouting America resources: How Plant Grafting Actually Works and Why It's So Cool (video)

Type of graft | Plants I used | Date

Why this method is useful

(4) Describe how one fruit, nut, or berry crop is processed for use.

Scouting America resources: How Pecans Are Manufactured | How It's Made (video)
How Are Raisins Made - Sun-Dried or Machine-Made? (video)

Crop I picked

How it is processed for use

☐ **(c)** Woody Ornamentals

(1) Plant five or more trees or shrubs in a landscape setting. Take full care of the trees or shrubs you have planted for one growing season.

Trees or shrubs I planted (five or more)

Tree or shrub	Where I planted it	Date planted

My care log for the growing season

Date	Care I gave

(2) Prune a tree or shrub properly. Explain why pruning is necessary.

Scouting America resources: Ask an Arborist: Why Do I Need to Prune? (video)
Ask an Arborist: What Are the Rules of Pruning? (video) · Ask an Arborist: The ABC's of Pruning (video)

Tree or shrub I pruned _____ Date _____

Why pruning is necessary

(3) List 10 trees (in addition to those listed in general requirement 6 above) and tell your counselor how each is used in the landscape. Give the common and scientific names.

Scouting America resources: 10 Most Popular Ornamental Trees for Your Garden (video)

10 more trees

#	Common name	Scientific name	How it is used in the landscape
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

(4) Describe the size, texture, color, flowers, leaves, fruit, hardiness, cultural requirements, and any special characteristics that make each type of tree or shrub attractive or interesting.

Feature	What makes each type attractive or interesting
Size	
Texture	
Color	
Flowers	
Leaves	
Fruit	
Hardiness	
Cultural requirements	
Special characteristics	

(5) Tell five ways trees help improve the quality of our environment.

Scouting America resources: The Importance of Trees for Our Environment and Health (video)
6 Ways Trees Benefit All of Us (website)

Five ways trees help

#	How trees help improve our environment
1	
2	
3	
4	
5	

☐ **(d)** Home Gardening

(1) Design and plant a garden or landscape that is at least 10 by 10 feet.

Scouting America resources: How to Design the Perfect Landscape | Landscape Design 101 (video)
10 Plants for a Bird-Friendly Yard | Audubon (website)

Where my garden is _____ Size (feet) _____ Date planted _____

My garden or landscape design (draw here or attach)

(2) Plant 10 or more different types of plants in your garden. Tell why you selected particular varieties of vegetables and flowers. Take care of the plants in your garden for one season.

Scouting America resources: Caring for a Vegetable Garden | HowStuffWorks (website)

What I planted (10 or more)

#	Plant	Variety	Why I picked it
1			
2			
3			
4			
5			
6			
7			
8			

What I planted (10 or more) (continued)

#	Plant	Variety	Why I picked it
9			
10			

How I took care of my garden this season

(3) Demonstrate soil preparation, staking, watering, weeding, mulching, composting, fertilizing, pest management, and pruning. Tell why each technique is used.

Scouting America resources: Remove Weeds Using These Effective Methods | Gardening 101 (video)
How to Mulch Your Garden: A Step-by-Step Guide (video) · Composting For Beginners (video)

Technique	Date I showed it	Why it is used
Soil preparation		
Staking		
Watering		
Weeding		
Mulching		
Composting		
Fertilizing		
Pest management		
Pruning		

(4) Tell four types of things you could provide to make your home landscape or park a better place for birds and wildlife. List the common and scientific names of 10 kinds of native plants that are beneficial to birds and wildlife in your area.

Scouting America resources: Get to Know These 20 Common Types of Native Plants (website)
Native Plant Recommendations | United States Botanic Garden (website)

Four things to make a home landscape or park better for birds and wildlife

#	What I could provide
1	
2	
3	
4	

10 native plants that help birds and wildlife in my area

#	Common name	Scientific name
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

☐ **Option C—Field Botany. Do ALL of the following:**

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

Natural area I visited _____ Date _____

(a) Determine which species of plants are the largest and which are the most abundant. Note whether they cast shade on other plants.

	Species	Do they cast shade on other plants?
Largest		
Most abundant		

(b) 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.

Scouting America resources: Environmental Factors Affecting Plant Growth (website)

Factor	How it may influence the plants on my site
Latitude	
Climate	
Air and soil temperature	
Soil type and pH	
Geology	
Hydrology	
Topography	

(c) 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.

Where	Plants I saw, and how they differ
Edge of a forest	
Near water	
In burned areas	
Near a road or railroad	

(2) 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 non-native).

Scouting America resources: Native Plants vs Exotic Plants | Which Are More Beneficial to the Ecosystem (video)

My study site _____ Size _____

#	Woody plant (tree or shrub)	Native or exotic	Non-woody plant	Native or exotic
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

(3) 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.

Scouting America resources: Scientific vs Common Names (video) · How to Key Out a Plant (video)

How an identification key works

#	Plant I identified with a key
1	
2	
3	
4	
5	

Requirement 8C3 (continued)

#	Plant I identified with a key
6	
7	
8	
9	
10	

Common names and scientific names: the difference, and why scientific names matter

(4) 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.

Scouting America resources: Pressing Plants for Herbarium Study (video)

My 10 pressed and labeled plants

#	Plant	Where and when I collected it
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Why voucher specimens are important

(5) 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.

Scouting America resources: Rare Plant Profiles (website)

Where I got my state's rare plant list

What is being done to protect rare plants and natural areas in my state

My paragraph about one rare plant in my state

(6) Do ALL of the requirements in ONE of the following alternatives:

☐ **(a)** Tree Inventory

(1) Identify the trees of your neighborhood, a park, a section of your town, or a Scout camp.

Scouting America resources: How to Use Twigs to Identify Trees (video)

Area I inventoried _____ Dates _____

(2) Collect, press, and label leaves, flowers, or fruits to document your inventory.

What I collected, pressed, and labeled

(3) List the types of trees by scientific name and give common names. Note the number and size (diameter at 4½ feet above ground) of trees observed and determine the largest of each species in your study area.

My tree inventory

Scientific name	Common name	Number observed	Diameter of the largest

(4) Show two or more people how to use a leaf or twig key to identify at least five species of trees or shrubs.

People I showed _____ Date _____

Species they identified with the key

☐ **(b)** Transect Study

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

Site 1 _____ Site 2 _____

(2) Use the transect method to study the two different kinds of plant communities. The transects should be at least 500 feet long.

Scouting America resources: Weekly Science Challenge #5: Create a Transect (video)

Site	Kind of plant community	Transect length (feet)
Site 1		
Site 2		

(3) 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.

Soil and other influencing factors

Site	What I observed
Site 1	
Site 2	

(a) Identify each tree within 10 feet of the transect line.

Trees I identified within 10 feet of the line

(b) Measure the diameter of each tree at 4½ feet above the ground, and map and list each tree.

My tree list

Site	Tree	Diameter at 4½ feet

My map of the trees (draw here or attach)

My graph or chart of the results from both sites (draw here or attach)

☐ **(c)** Nested Plot

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

Site 1 _____ Site 2 _____

(2) Mark off nested plots and inventory two different kinds of plant communities.

Site	Kind of plant community	Date
Site 1		
Site 2		

(3) 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.

Soil and other influencing factors

Site	What I observed
Site 1	
Site 2	

(a) 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 4½ feet above the ground.)

Trees in the 100-by-100-foot plot

Site	Tree	Diameter at 4½ feet

My map of the trees in each plot (draw here or attach)

(b) Identify and count all trees and shrubs in a 10-by-10-foot plot within each of the larger areas.

Scouting America resources: Tree Identification | Ask the Arborist (video)

Trees and shrubs in the 10-by-10-foot plot

Site	Tree or shrub	Count

(c) Identify and count all broad-leaved plants (trees, shrubs, vines, and herbaceous plants) and all plants (wildflowers, ferns, grasses, mosses, etc.) of a 4-by-4-foot plot within the 10-by-10-foot plot. Note: If individual plants like ferns, grasses, and mosses cannot be clearly distinguished, make a reasonable estimate of area (square inches of cover) for each species and record that as an estimate within the 4 x 4 subplot.

Plants in the 4-by-4-foot plot

Site	Plant	Count or estimated cover (square inches)

My graph or chart of the results from both sites (draw here or attach)

☐ **(d)** Herbarium Visit

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

Scouting America resources: What Is a Herbarium? The Scientific and Historical Treasures of the Cambridge University Herbarium (video)

Herbarium or website _____ Date _____

(2) 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.

How the specimens are arranged, and how researchers use them

Voucher specimens of a rare plant I saw (if possible)

(3) 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.

Scouting America resources: Pressing Plants for Herbarium Study (video)

How a voucher specimen is mounted and prepared for permanent storage

How to handle specimens so they are not damaged

(4) Tell about the tools and references used by botanists in an herbarium.

Scouting America resources: How Herbarium Specimens Are Prepared at the Cambridge University Herbarium (video)

Tools and references botanists use in an herbarium

☐ **(e)** Plant Conservation Organization Visit

(1) Write ahead and arrange to visit a private conservation organization or government agency that is concerned with protecting rare plants and natural areas.

Organization or agency _____ Date of visit _____

Date I wrote ahead _____

(2) Tell about the activities of the organization in studying and protecting rare plants and natural areas.

Their work studying and protecting rare plants and natural areas

(3) If possible, visit a nature preserve managed by the organization. Tell about land management practices such as controlled burning, or measures to eradicate invasive (non-native) plants or other threats to the plants that are native to the area.

Nature preserve (if I visited one) _____ Date _____

Land management practices I learned about

Requirement 8 completed on _____ counselor initials _____

9. Discuss the importance of the Leave No Trace Seven Principles and the Outdoor Code as they relate to plant science. Explain how you have followed the Leave No Trace Seven Principles and the Outdoor Code while in natural areas during field observation, specimen collection, and identification.

Scouting America resources: Leave No Trace Basics (video) · Leave No Trace Outdoor Ethics (video)

Why Leave No Trace and the Outdoor Code matter in plant science

How I followed the Leave No Trace Seven Principles and the Outdoor Code

Activity	What I did
Field observation	
Specimen collection	
Identification	

Requirement 9 completed on _____ counselor initials _____

Counselor sign-off

Your counselor signs your blue card or approves the badge in Scoutbook, and your unit records it. This line is for your own records.

Counselor's signature _____ Date completed _____

Official Scouting America resources

Scouting America resources: Plant Science merit badge page (requirements and resources) · Plant Science merit badge pamphlet (free PDF)
All merit badges

Made by Cole at ScoutSmarts.com, an Eagle Scout who loves helping Scouts.
Spot an error or a requirement change? Tell me at scoutsmarts.com/contact.
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