

Activity #2

Backyard/School Survey

Length:

Two or three class periods, allowing a week in between session two and three for specimens to dry

Prerequisite Activity:

None

Objectives:

- Develop basic botany skills: plant identification, specimen collection, and voucher preparation.
- Record field notes.

Vocabulary:

Botany/botanist

Pinnate

Topography

Habitat

Reproductive structures

Voucher

Parallel

Specimen

Palmate

Terrain

● ● ● Class Period One: *Collecting the Plant Samples*

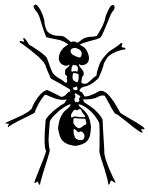
Note:

This can be assigned as homework or done at school. Students can collect specimens from their backyards or around the schoolyard.

Materials & Setup

For each student

- Student Page: “Collecting a Scientific Specimen” pp. 83-91
- Newspaper
- Glue (Elmer’s or other brand)
- Stiff cardboard or flat wood pieces measuring 11 ½ x 16 ½ inches or larger (two per student)
- Clamps (two or more per student)
- Plant sample (collected by student)
- Field notebook (could be regular or waterproof type, such as Rite in the Rain)
- Pencil or waterproof pen
- Masking tape or paper tags
- Sealable plastic bag
- Gloves, pruning shears, trowel
- Camera (optional)
- Global positioning system (GPS) (optional)
- Acid-free paper measuring 11 ½ x 16 ½ inches or 8 ½



Instructions

- 1) Tell students they will be surveying their backyard or schoolyard for weedy species, collecting a plant specimen, and preparing a voucher.
- 2) Instruct them to review the Student Page: “Collecting a Scientific Specimen,” before choosing their plant. Make sure they record the required data as they collect. Plants that are especially woody or succulent should be avoided for this exercise, as they will be difficult to press.
- 3) Explain that properly collected plant vouchers are essential for taxonomic identification. They provide a permanent record of information that can be reviewed or assessed as botanists learn more. A good voucher consists of a dried, pressed section of a plant containing well-preserved vegetative and reproductive structures (flowers and/or fruits). Scientific determinations are only as good as the specimens on which they are based; poor quality specimens (lacking flowers or fruits or insufficiently documented) may result in incomplete or unreliable identifications.

● ● ● Class Period Two: *Identifying the Plant*

Instructions

- 1) If possible, identify the species collected using plant guides available online and from library.

One excellent source is: *Weeds of Hawai‘i’s Pastures and Natural Areas; An Identification and Management Guide* by P. Motooka et al. ©2003, College of Tropical Agriculture and Human Resources, University of Hawai‘i at Manoa.

Another source is the *Maui Early Detection Guide*.

Download this guide at <http://pbin.nbii.org/reportapest>

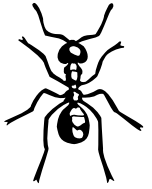
If you suspect any of the plants collected are invasive species, follow the instructions in the guide, or call Maui Invasive Species Committee at (808) 573-MISC.

Main features to look for:

Leaves. What shape are they? Are the edges smooth or toothed? Look at the leaf veins: what kind of pattern are they in? If **parallel**, the veins run side by side (like grass). If **pinnate**, small veins branch out from the middle, resembling a feather. If **palmate**, the veins have several major veins with smaller ones branching from them (like a *kukui* leaf). If the plant has needles rather than leaves, are they long or short? Covered with scales? Find identical leaves in your field guide.

Flowers. Count whether the petals come in multiples of three, four or five. Note color, shape and arrangement of petals. Remember that “flowers” refer to the reproductive parts of the plant. Not all flowers are showy with colorful petals; grass flowers are simple tassels.

Fruit. What type of fruits does the plant produce? Describe the fruit: shape, color, size. Is it fleshy or dry? Does it have a large pit or multiple small seeds?



- 2) Assist students in preparing and pressing their plant samples. See Student Page “Collecting a Scientific Specimen.”

● ● ● Class Period Three: *Preparing the Voucher*

Materials & Setup

For each student

- Voucher label (print and cut Copy Master: Voucher Labels p.81)
- Glue

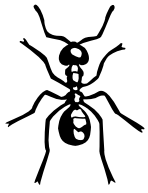
Instructions

Allow a week or more for pressed specimens to dry prior to this class.

- 1) Once the specimens have dried, have students remove them from the press and mount them on acid-free paper with glue. Encourage them to handle the brittle plants with care. Photographs of the original plant may be included on the same page. (Be sure to label photos with voucher number.)
- 2) Have students affix a voucher label in the lower right hand corner of their sheet with the following information:
 - Genus, species (if known; if not known write “Species unknown”)
 - Family
 - Location (description and GPS coordinates, if known)
 - Habitat, topography, vegetation, soil type, altitude
 - Frequency: rare, occasional, or common (is the plant rare or plentiful in the area?)
 - Plant description: height of plant; scent; color, shape, and orientation of leaves, flowers, and fruits
 - Date of collection
 - Name of collector
 - Name of identifier
 - Voucher number (assign a unique number to each voucher to identify it according to collector and class)
- 3) Attach a small paper pouch to each sheet for extra flowers or fruits or any pieces of the specimen that become dislodged over time.
- 4) Create a voucher log, listing all of the students’ voucher numbers and descriptions of each.

Journal Ideas

- How has plant identification changed with advances in genetics? Do you think field observations are as important as they were prior to this technology? Why or why not?
- If you suspect that your plant is invasive, would that change the way you collect it? What kinds of preventative measures could you employ to prevent spreading it to new areas?
- Why is collecting good data important? Imagine you are a botanist studying population changes in rare Hawaiian species. At Bishop Museum, you find a drawer full of plant vouchers. They are



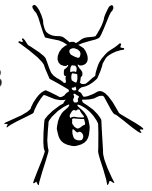
missing data concerning where they were collected or when. How might this affect your research? How might it affect conservation efforts for the species?

Assessment Tools

- Participation in schoolyard survey
- Completed voucher and voucher log
- Journal entries

Enrichment Ideas

- Have students create note cards with pressed flowers and plants.
- Team up with art teacher on botanical drawing exercises.
- Substitute marine plants or insects.



Genus, species: _____
Family: _____
Location: _____
Habitat: _____

Frequency: rare occasional frequent

Plant description: _____

Date collected: _____
Collector: _____
Identifier: _____
#: _____

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Family: _____
Location: _____
Habitat: _____

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