

Introduction to Botanical Anatomy for Field Sketching

By Christine Elder

Introduction

Plants are a great subject to draw, with a wide variety of colors, shapes and sizes to hold your interest. Plus, unlike birds and other animals, they patiently wait quietly while you draw them! But, like animals, the more you know about the range of anatomical variations within the plant kingdom, the better you'll know what to pay attention to when drawing them, especially if your aim is to be able to identify the plant from your notes and sketches. Examples include characteristics such as petal number, leaf shape and habitat.

When you are considering drawing a plant specimen, always look at a few examples first, since plants exhibit more natural variation than animals. You should aim to draw an example of the norm, not the anomaly, like a 4-leaf clover.



If you are hoping to identify the species you are drawing, such as a wildflower you discover on a hike, try to sketch both a leaf and a flower, as well as a fruit if possible (you may need to examine several plants in order to find all three).

Below, I outline the basic structures of plants that you will want to notice in order to sketch them with enough detail to be able to identify them in a regional field guide, of which there are many. For example, if you sketched a plant with a square stem and opposite leaves, with a bilaterally symmetrical flower, you most likely were looking at a member of the mint family, especially if you'd made note of a sweet or pungent odor! The words in parentheses are common examples.

What to notice about flower structures

- Number of petals
 - 3 (trilliums)
 - 4 (mustards)
 - 5 (wild roses)
 - 6, although three of the 'petals' are actually sepals (lilies)
 - Many (sunflowers, cactus)
- Petals free or fused into a tube (aloes)
- Color of petals
 - You should aim to develop a greater vocabulary around color, perhaps using the names of your watercolor or colored pencil hues. So, instead of saying the petals are red, are they rose, crimson, magenta or cadmium red?
- Symmetry of flower
 - Radial (carnation)



- Bilateral (mints, orchids)
- Scent (sweet, pungent, oniony, foetid, or unscented)
- Number of sexual parts (ie; number of anthers and stamens)
- Unique variations on the flower theme. Many species, especially those in tropical families like heliconia, orchid, hibiscus, ginger, anthurium, passion flower, protea, and bird of paradise, have highly modified flowers whose petals are fused into unique shapes.

What to notice about inflorescences

Terms for how each flower is arranged on the stem:

- Single (tulips)
- Raceme (snapdragon)
- Umbel (onions)
- Compound umbel (carrots)
- Head (sunflowers)



What to notice about fruits

- As a college professor once told me “by their fruits, ye shall know thee”, meaning that fruits are the most unique part of a plant that will help to identify it when all else fails. Many fruits are lovely and intricate to draw and paint. There are many scientific terms for the wide variety of fruits, but they can be broken down into two basic types:
 - Dry fruits: acorn, maple samara, dandelion seed
 - Fleshy fruits: blackberry, tomato, apple, orange

If a plant’s flowers and/or fruits are absent, it will be a lot harder to identify the species if you aren’t already familiar with it, but you can still enjoy sketching it. You’ll need to rely on other aspects of the plant’s anatomy.



What to notice about leaf structure

What comes to mind when you hear the word ‘leaf’? Likely, it’s something like an oak or maple, or an example from a plant that grows in your yard. But leaves come in a dizzying array of sizes, shapes, colors and most importantly, function. We learn in grade school that leaves are for capturing the sun’s energy, but that’s not all they do. Leaves have evolved to serve a wide variety of functions in different types of plants.

My favorite example comes from the subject of my master’s thesis in college – carnivorous plants. They have adapted myriad ways to use their leaves to attract, capture, and then digest their insect prey. Other groups of plants have modified their leaves for water capture (cups of bromeliads), protection from herbivores (spines of cacti and toxic sap of poison oak), storing water (succulents), climbing (tendrils of peas), following the sun (sunflowers), attracting pollinators (the petal-like leaves of poinsettias) and even reproduction (the leaf edges of Kalanchoe can drop and grow into a new plant!) This wide variety of leaf form and function makes them a fun and challenging subject to sketch. Observe leaves for the following characteristics:

- Venation; patterns of veins on the leaf
 - parallel (grass, lilies, orchids) or net-veined (most other familiar species)
- Overall shape (linear, elliptical, heart-shaped, or modified into climbing tendrils)
- Shape of a leaf's apex and base
- Degree of lobing (maples)
- Leaf simple, or divided into leaflets (pea family)
- Outer edge: smooth, serrated (blackberry), or spiny (holly)
- Surface traits: glossy (philodendron), hairy (lamb's ears). But be careful of touching leaves like poison oak and stinging nettle!
- Fleshiness (cactus and other succulents)
- Scent (sweet, pungent, oniony, foetid, or unscented)
- Arrangement of individual leaves along the stem:
 - Alternate (a majority of common plants)
 - Opposite (the mint family, which includes most garden herbs)
 - Whorled (more than two leaves arising from each node, fairly uncommon)
 - Basal rosette (leaves arising only from the base of the plant, fairly uncommon)



What to notice about stems

- Stem shape in cross section (flattened, round, square, triangular)
- Woody or herbaceous
- Having spines, or smooth, sticky, prickly

What to notice about the plant overall

- Habit (tree, shrub, herb, vine, epiphytic, parasitic)
- Habitat (grassland, forest)
- Microhabitat (aquatic, moist, dry, sunny, shady)



References for further reading on botanical drawing and identification

[Beautiful Botanicals](#) by Bente Starcke King

[Botanical Drawing in Color: A Basic Guide to Mastering Realistic Form and Naturalistic Color](#) by Wendy Hollender

[The Art of Botanical Drawing](#) by Agathe Ravet-Haevermans

[Botanical Illustration Course with the Eden Project](#) by Rosie Martin and Meriel Thurstan

[The Kew Book of Botanical Illustration](#) by Christinabel King

[Botany for the Artist: An Inspirational Guide to Drawing Plants](#) by Sarah Simblet

Resources on plant identification

(Check your local bookstore or the internet for the many excellent regional guides to native plants)

Struwe, L. 2009. *Field identification of the 50 most common plant families in temperate regions (including agricultural, horticultural, and wild species)*. Rutgers University, New Brunswick, NJ, USA. Published by the author, available at <http://www.rci.rutgers.edu/~struwe/>

USDA Natural Resources Conservation Service [Plants of the US Database](#) (Includes all native, endangered, agricultural crops, introduced and invasive plant species).

Practice

See the following pages for some leaves and flowers to practice sketching. Enjoy!



Examples of leaf shapes



Examples of flower shapes

