How-to Use This Guide
In Chicago, the growing season is about eight months, from March to November. Native plants spend most of this time not in flower. To make sure you do not confuse a native plant for a weed, it will help to know how to recognize the leaves as well as the flowers.

Botanists use hundreds of terms to describe a leaf. A gardener needs be aware of a handful of traits to successfully ID a plant. The following sections contain the basic information you will need to know to identify a plant, in bloom or not.

When you find a plant whose ID you are not sure of, follow these basic steps:

1. Examine the leaf, noting the basic traits listed below. Take quick notes, including the leaf size. You can also take a picture of the leaf for reference. Also take a picture of the entire plant.
2. Skim through this guide and look for plants with a similar shape and size.
3. Compare the descriptions in the guide with the leaf you are trying to identify.
4. Use technical details of the plant to verify species.
5. Compare to weed look-alikes from the weed guide to rule out weed species. This guide lists look-alikes to native plants used in Roots Neighborhood Habitat gardens. (Look-likes are generally weeds, non-native plants, and other plants that are less desirable from an environmental health perspective.)

Leaf Parts
The most important parts of a leaf are labeled on this drawing. Not every leaf will have all these parts.

Blade – the leaf tissue.
Midrib – the central vein of a leaf. Provides support to the leaf and transports nutrients between the leaf and the roots.
Vein – secondary support and transport structures branching off the midrib.
Petiole – a stalk that attaches the leaf to the stem. Sometimes a thin strip of blade tissue grows along the petiole; this is called a winged petiole.

Not all leaves have petioles. Leaves that are flush to the stem are sessile.
There are two basic leaf types: Simple and compound. A simple leaf is one with a single leaf blade. A compound leaf (left) has multiple leaf blades, called leaflets.

**Leaf Shapes**

There are over 50 terms to describe the shape of a leaf. A dozen or so of these shapes pertain to most plants found in the Chicago area. These terms are used in most field guides and basic botany/gardening references.
Leaf Arrangement
Leaves grow from nodes along the stem. Nodes are like joints that separate different segments of the plant. New growth starts from nodes. There are three basic ways that leaves grow on stems:

- **Alternate:** only one leaf grows from a point on the stem; appear spirally arranged.
- **Opposite:** two leaves grow from the same point on the stem, directly across from each other.
- **Whorled:** three or more evenly-spaced leaves grow from the same point.
- **Basal Leaves:** leaves in a whorled arrangement at the base of the plant.
Leaf Margin

The leaf margin is the edge of the leaf. The most common leaf margins are pictured below.

- Rounded Teeth (Crenate)
- Pointed Teeth (Dentate)
- Smooth (Entire)
- Cut (Lobed)
- Sawtooth (Serrate)
- Wavy (Undulate)

Lobed vs. Compound

The differences between a lobed leaf and a compound leaf are:

- On a lobed leaf, the lobes are often irregularly shaped. On a compound leaf, the leaflets are usually the same shape.
- On a lobed leaf, there will be blade tissue connecting the lobes to the midvein. On a compound leaf, the leaflets are separated from each other.
- On a lobed leaf, each lobe usually has a single prominent vein. On a compound leaf, the leaflets will have a midrib and branched veins.

To determine the shape of a lobed leaf, trace an outline between the tip of each lobe. This oak leaf, when traced, is revealed to have an oval shape.
Leaf Guide
The following guide offers pictures and tips to identify native wildflowers used in Roots Neighborhood Habitat gardens. The plants in the guide are arranged by leaf shape, starting with narrow, grass-like leaves. Plants with compound leaves are near the end of the guide. A brief description of each plant is given to help identification. When there are garden weeds that have similar leaves, the major differing traits will be listed.

A photograph of the flowers, the typical leaf, and a line drawing for each plant is included to help show the finer details of each plant. Where there are weedy lookalikes, a line drawing for the weed is also included to help illustrate the differences between the native plant and the weed plant.

At the end of the section is a table that summarizes the detailed botanical traits of each plant. If you are looking at a plant and still aren’t sure what species it is, use the table to match the traits of your mystery plants to the descriptions.
Nodding Onion

Allium cernuum

Before flowering, nodding onion looks like a clump of grass. Unlike grasses, onions have no leaves on the main flowering stem. The leaves have a distinct onion smell when broken or crushed. The cluster of pink flowers bloom mid-to-late summer and droop down.

Weed Lookalikes: most grasses

Onion leaves emerge from a bulb, and appear to originate at the base of the plant. Grass leaves are found up and down the entire stem.
Ohio Spiderwort

*Tradescantia ohiensis*

Spiderworts emerge early in the year and resemble a grass until the bright purple flowers bloom in late spring and early summer. The leaves have a waxy white coating that rubs off when touched. Broken leaves exude a sticky sap that gives this plant one of its common names, “snotweed”.

**Weed Lookalikes:** most grasses; Asiatic dayflower (*Commelina communis*)

Spiderworts can be told apart from grasses by the sticky sap that exudes from broken stems and leaves. Asiatic dayflower, a garden weed, has lance-like leaves instead of grass-like leaves. Asiatic dayflowers only have two purple petals compared to the three petals of spiderworts.
Whorled milkweed plants emerge late in the spring and flower in late summer. They typically grow 12-16 inches tall. The needle-like leaves give the appearance of a pine branch. Clusters of small white flowers emerge near the top of the stem. The plant exudes a white sticky sap if leaves or the stem are broken.

Weed Lookalikes: bedstraws (*Galium sp.*), horsetails (*Equisetum sp.*)

Bedstraws and horsetails are native plants that occasionally pop up in gardens, especially wet or shaded gardens. Bedstraws also have whorls of leaves and small white flowers. Bedstraw leaves are usually oblong and are often sticky due to Velcro-like hairs. Bedstraw flowers have 4 petals; milkweeds have 5. Horsetails, distantly related to ferns, have rough stems that grow from nodes and resemble leaves; whorled milkweed is smooth.
Mountain Mint

*Pycnanthemum virginianum*

Mountain mint puts out a cluster of square stems with narrow opposite leaves. The small white flowers, usually with pink-purple spots, bloom in late summer. The leaves give off a sweet mint smell when broken or crushed. When established, mountain mint can resemble a small shrub.

Weed Lookalikes: none
Flowering Spurge

*Euphorbia corollata*

Flowering spurge has a unique leaf arrangement. On the main stems, the leaves are arranged in a spiral pattern up the stem. Where the stems branch, the leaves are whorled. On flowering branches, the leaves are opposite each other. The white “flowers” are modified leaves that stay on the plant from early summer to early fall. The leaves and stems exude a sticky white sap if broken or crushed.

Weed Lookalikes: none

![Flowering Spurge leaves](image)

![Euphorbia corollata Flowering Spurge](image)
Fringed Wild Petunia

*Ruellia humilis*

Fringed wild petunia grows low to the ground, seldom more than 12 inches tall. The fuzzy, lance-shaped leaves are opposite each other on the hairy stem. Mature plants can put out several stems that make the plant spread out like a groundcover. The delicate purple flowers bloom in mid-summer.

Weed Lookalikes: garden periwinkle (*Vinca minor*)

Periwinkle is a ground vine that is popular as a groundcover and sometimes escapes gardens. Periwinkle leaves are glossy, deep green, and fleshy. Wild petunia leaves are dull, bright green and hairy. Periwinkle flower petals are offset and look like a pinwheel. Wild petunia flowers look like a star.
Pussytoes  
*Antennaria neglecta*

Pussytoes are a spring wildflower that grows and spreads as a groundcover. The mint-green leaves emerge in a whorl in early spring and persist through summer. The leaves are usually elongated, sometimes paddle-shaped. A single fuzzy stem grows from the center of the whorl. Tiny leaves appear pressed against the stem. White flowers clustered like a cat’s paw bloom in late spring. Pussytoes have separate male and female plants, so the flowers may look different from one plant to another.

**Weed Lookalikes:** mullein (*Verbascum thapsus*); Hawkweeds (*Hieracium sp.*)

Newly sprouted mullein looks similar to pussytoes. Mullein leaves are hairy all over and have pointed tips. Pussytoes leaves are hairy only on the back and have rounded tips. Mulleins quickly grow larger than pussytoes.

There are several weedy hawkweeds, all of which produce basal leaves. Hawkweed leaves and stems are lance-like with stiff hairs; Pussytoes are rounded with soft hairs. Hawkweeds bloom in the summer and have yellow or red flowers.
Shooting Star

*Dodecatheon meadia*

Shooting star is one of the first wildflowers to emerge. A whorl of delicate, waxy leaves appears in late March or early April. A single stem emerges and the downward-pointing pink flowers bloom in late spring. The plant dies back in summer, but the dried red stems are woody and persist until winter.

Weed Lookalikes: common evening primrose (*Oenothera biennis*), mullein (*Verbascum thapsis*), hawkweeds (*Hieracium sp.*) The table below will help tell the leaves of these plants apart:

<table>
<thead>
<tr>
<th></th>
<th>Margin</th>
<th>Tip</th>
<th>Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shooting Star</td>
<td>smooth</td>
<td>rounded</td>
<td>smooth</td>
</tr>
<tr>
<td>Evening Primrose</td>
<td>toothed</td>
<td>pointed</td>
<td>smooth</td>
</tr>
<tr>
<td>Mullein</td>
<td>smooth</td>
<td>rounded</td>
<td>hairy</td>
</tr>
<tr>
<td>Hawkweed</td>
<td>smooth</td>
<td>pointed</td>
<td>hairy</td>
</tr>
</tbody>
</table>

Shooting Star leaves

*Hieracium aurantiacum*

Orange Hawkweed

*Oenothera biennis*

Evening Primrose
Butterfly Weed
*Asclepias tuberosa*

Butterfly weed is one of the last wildflowers to emerge in late spring. The hairy stems of dense, spirally arranged leaves grow quickly to 18-24 inches. Mature plants produce up to 16 stems, giving a bushy appearance. A cluster of bright orange flowers blooms in early to mid-summer.

Weed Lookalikes: evening primrose (*Oenothera biennis*)

Evening primrose stems have dense, spiral leaves like butterfly weed. Evening primrose leaves have toothed edges and a smooth texture. Butterfly weed leaves have smooth edges and a lightly fuzzy texture. An evening primrose produces one stem. Butterfly weed can produce multiple stems.
New England Aster

*Aster novae-angliae*

A cluster of stems with densely spiraled stem-clasping leaves emerges in spring. The stems grow low until mid-summer, when they put on a growth spurt and reach up to 3 feet tall. The leaves and stems are covered in stiff hairs. The bright purple flowers bloom in fall and can persist into November.

Weed Lookalikes: none*

*There are several native wildflowers that sometimes pop up in gardens that resemble New England aster. Fleabanes (*Erigeron sp.*) bloom in late spring and early summer and have light pink, almost white flowers. They are hairy like New England aster. Fleabanes have lance-shaped leaves that do not clasp the stem. Fleabanes will not cause any harm if left to grow, but they can get tall and bushy, up to 4 feet.
Sky Blue Aster
*Aster azureus*

Sky blue aster first puts out a rosette of heart-shaped or arrow-shaped leaves in early summer. Next it produces the flowering stem, which has lance-like leaves. The leaves have a texture like sandpaper. The plant blooms in late summer and early fall.

Weed Lookalikes: other asters, chicory (*Cichorium intybus*)

There are two native asters that sometimes show up in gardens: Drummond’s aster (*Aster drummondii*) in shady spots or hairy aster (*Aster pilosus*) in sunny spots. Leaf bases of Drummond’s aster have deeper clefts than sky blue aster and the heart-shaped leaves grow along the entire stem. The petioles of Drummond’s aster are winged, where a smaller leaf-like blade continues down to the stem. Hairy aster usually has a hairy stem, and has white instead of purple flowers. Hairy aster has lance-shaped basal leaves.

Chicory is rarely found in gardens. The basal leaves look like dandelion leaves; leaves on the stem are narrow and stubby. The blue flowers lack the yellow “eyes” of asters.
Blazing stars send up a single stem densely packed with spirally arranged leaves. The leaves are large and lance-shaped near the base of the plant, and become smaller and narrower near the top. Petioles are long on the lower leaves, short and nearly absent on the upper leaves. The purple flower heads are white as they form, looking like cauliflower.

Weed Lookalikes: horseweed (*Conzya canadensis*)

Horseweed and blazing star look similar when they first appear in late spring/early summer. Blazing star leaves have smooth edges and a slightly rough texture. Leaves near the base have long petioles. Horseweed leaves have sawtooth margins, a smooth texture, and are always attached directly to the stem.
Pale purple coneflowers emerge in spring with a whorl of long-stalked leaves that are rough to the touch. Plants may not flower every year. When the plant flowers it puts up a single stem with a showy purple daisy-like flower. After blooming the flower heads dry to a red-brown color and will persist over winter. It is guessed that pale purple coneflowers can live over 100 years.

**Weed Lookalikes:** Plantago lanceolata-English plantain

English plantain leaves have short petioles, are smooth to the touch, and have toothed edges. Purple coneflower leaves have long petioles, are rough to the touch, and have smooth edges.
Purple Coneflower

*Echinacea purpurea*

Purple coneflowers begin to grow in the spring. Long-stalked teardrop-shaped leaves emerge in early April, followed by a number of flowering stems that can give a mature plant a shrubby appearance. Stems are sometimes branching and bloom in mid-summer with multiple flowers. Stems and flower heads dry to a dark brown color and will persist over winter.

Weed Lookalikes: none
Wild quinine leaves and stems have a tough, leathery feel that is different from most other plants. It first produces a whorl of basal leaves, and then puts up a flowering stem. The small white flowers open in mid-summer. The leaves of wild quinine fold in on themselves, giving the leaf a wavy appearance when flattened.

Weed Lookalikes: bonesets (*Eupatorium sp.*)

Bonesets are a native wildflower that spreads into gardens from roadsides and alleys. Like wild quinine, the plants have small heads of white flowers. Unlike wild quinine, bonesets have opposite leaves. Wild quinine blooms in summer, while bonesets bloom in fall. Though native, bonesets can be weedy (over 4 feet tall) in gardens.
Showy Goldenrod

*Solidago speciosa*

Showy goldenrod first appears in early summer. Multiple stems of large, spirally arranged leaves emerge from a central root. Older leaves near the bottom of the stem have an oval or teardrop shape. Younger leaves near the top are usually lance-shaped. The stems grow quickly come later summer, and plumes of yellow flowers emerge in the fall. Leaf margins are usually slightly sawtoothed, sometimes smooth.

Weed Lookalikes: none
Wild Bergamot

*Monarda fistulosa*

Bergamot emerges as a clump of stems in spring. The yellow-green serrated leaves are distinct, as is the oregano-like scent when leaves are broken or crushed. The pink mint-like flowers emerge from heads at the tips of the stems in mid-summer. Stems can grow 3-4 feet in a garden setting.

Weed Lookalikes: deadnettles (*Lamium sp.*), spearmint (*Mentha spicata*), catnip (*Nepeta cataria*)

A number of mints pop up as garden weeds. The table below lists their different traits:

<table>
<thead>
<tr>
<th></th>
<th>Shape</th>
<th>Attachment</th>
<th>Margin</th>
<th>Texture</th>
<th>Scent</th>
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</thead>
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<td>saw-toothed</td>
<td>hairy</td>
<td>earthy</td>
</tr>
<tr>
<td>Spearmint</td>
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<td>saw-toothed</td>
<td>smooth</td>
<td>minty</td>
</tr>
<tr>
<td>Peppermint</td>
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<td>saw-toothed</td>
<td>smooth</td>
<td>minty</td>
</tr>
<tr>
<td>Catnip</td>
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<td>blunt-toothed</td>
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<td>earthy</td>
</tr>
<tr>
<td>Deadnettles</td>
<td>triangular</td>
<td>stalked</td>
<td>blunt-toothed</td>
<td>hairy</td>
<td>none</td>
</tr>
</tbody>
</table>
Hoary Vervain

*Verbena stricta*

Vervain plants appear in late spring when stems emerge. The clinging, opposite leaves are covered in small dense hairs. The floral spikes appear in midsummer, with small purple flowers blooming up and down the length.

Weed Lookalikes: spearmint (*Mentha spicata*) and other mints

Hoary vervain has a square stem and opposite leaves, like mints. The leaves completely lack scent when crushed. Most mints have a scent when the leaf is crushed.
Brown-eyed Susan

*Rudbeckia triloba*

The gray-haired stems and leaves of brown-eyed Susan appear in spring. The stems may branch several times, each branch ending in a bright yellow flower that blooms mid-summer. The spirally arranged leaves near the base of the plant are large and lobed. The leaf stalks are “winged”, meaning they have a narrow band of leaf tissue attached.

Weed Lookalikes: giant ragweed (*Ambrosia trifida*) (refer to Weed guide, page 26)

On brown-eyed Susan, only the large leaves near the base of the stem are lobed. On giant ragweed, all leaves are lobed regardless of their location on the stem.
Prairie Coreopsis

*Coreopsis palmate*

The three-lobed opposite leaves of prairie coreopsis are distinct in the garden, where it can grow up to 4 feet tall. The bird-foot like leaves will not be mistaken for any other plant. The bright yellow flowers bloom in early summer.

Weed Lookalikes: none
Alum root appears in spring when a whorl of numerous round or fan-shaped leaves (20 or more) emerges. In summer a hairy spike emerges, containing numerous yellow-green flowers. The foliage persists through the end of summer helping to shade the soil.

**Weed Lookalikes:** violets (Viola sp.)

Alum root leaves resemble lawn violets when they first emerge. As alum root leaves grow they develop a wavy, lobed margin. Lawn violet leaves are typically blunt-toothed and lack lobes.
Spotted Geranium

*Geranium maculatum*

The distinct 5-lobed leaves of spotted geranium appear in early spring; first a whorl of leaves, then flowering stems with clinging leaves. The lobes of the basal leaves sometimes develop secondary lobes which look like deep serrations. The purple flowers appear in late spring. Foliage persists into summer.

Weed Lookalikes: none
Thimbleweed

*Anemone cylindrica*

Thimbleweeds are an early summer wildflower with a lobed leaf similar to spotted geranium. The secondary lobes of thimbleweed leaves are prominent. The stems and leaves are covered with fine hairs. Clusters of white flowers appear in June. As seeds mature, the flowers form a thimble-like spike that gives this plant its name. Leaves vary; the lobes can have pointed margins as shown below, or rounded margins as shown above.

Weed Lookalikes: none
Red Columbine

*Aquilegia canadensis*

Red columbine leaves resemble parsley leaves. The red-stalked leaves appear in early spring along with the flowering stems. The red flowers are unusual for plants of this area and appear at the end of spring. The flowers hang downwards.

Weed Lookalikes: garden columbine (*Aquilegia vulgaris*)

Garden columbine easily escapes from formal gardens, especially in areas with shade trees. The best way to tell red columbine from garden columbine is by flower color; garden columbine is purple or pink. Lobes on red columbine leaves are usually sharper and deeper than those of garden columbine.
Wild Strawberry

*Fragaria virginiana*

Wild strawberry grows as a creeping vine, spreading by runners. The three-parted compound leaves with saw-tooth edges persist through the year; they turn deep burgundy in the fall, and are replaced by new leaves in spring. Leaflets are a teardrop shape; the terminal (tip) leaflet is usually opposite the lateral (side) leaflets. The white flowers appear in spring, and the sweet red berries are ripe by early summer.

Garden Weed Lookalikes: Indian strawberry (*Duchesnea indica*)

The leaves of Indian strawberry have margins that are dentate and the terminal leaflet is oriented the same way as the lateral leaflets. Indian strawberry has yellow flowers and the bitter fruit points up.
Golden Alexander

*Zizia aurea*

This spring-blooming plant has unique compound leaves with three leaflets. The leaflets are often irregularly lobed. The older basal leaves are often twice compound. The plant keeps the leaves through throughout summer. The yellow flowers resemble those of dill, a plant grown as a spice.

Weed Lookalikes:  wild parsnip (*Pastinaca sativa*)

Wild parsnip is becoming increasingly common along roadsides and in abandoned lots and can move into gardens. DO NOT TOUCH! The sap from this plant will cause a rash if it gets on bare skin. Wild parsnip leaves have 5-15 leaflets; golden Alexanders always have 3. The flowers of both look identical. Wild parsnip is a biennial and produces only basal leaves in the first year of growth.
Purple Prairie Clover

*Dalea purpurea*

Purple prairie clover is a bushy, almost shrubby wildflower that produces spikes of bright purple flowers in mid-summer. The 3-or-5-parted compound leaves are small and delicate and will not be mistaken for any other plant in a garden, weed or otherwise. Dried floral spikes will persist through winter. Like most members of the bean family, purple prairie clover helps add nitrogen to the soil.

Weed Lookalikes: none
Canada milk vetch

*Astragalus canadensis*

This member of the bean family produces reddish woody stems with spirally-arranged compound leaves. The stems are usually branching near the tip. Spikes of cream colored flowers bloom in mid-summer. The leaves have 15-35 leaflets, always an odd number. Older leaves near the bottom of the plant will have more leaflets than those at the top.

Garden Weed Lookalikes:  crown vetch (*Securigera varia*)

Pre-flowering growth of Canada milk vetch and crown vetch looks almost identical. Both have an odd number of leaflets. Crown vetch leaves have fewer leaflets than Canada milk vetch, usually 11-25. Canada milk vetch stems are tall (usu. 24-36 inches), erect, and are often reddish. Crown vetch stems are shorter (usu. 16-24 inches), have a tendency to droop, and are usually greenish.