

Identifying Pennsylvania Trees

Pennsylvania Forest Stewardship Program



Objective for this presentation: To help individuals learn to identify common Pennsylvania trees using the *Summer Key to Pennsylvania Trees* (free copies available from the PA Forest Stewardship Program, phone number below).

This program consists of images and a suggested narrative, and is available as a PowerPoint® presentation. Use the narrative as a base for your presentation, but please do not read it verbatim. Feel free to adapt this program if you wish.

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Prepared by Paul Roth, Research Assistant, and Rance Harmon, Extension Associate, The Pennsylvania State University, School of Forest Resources & Cooperative Extension for the Pennsylvania Forest Stewardship Program (Jan. 2002). The Pennsylvania Forest Stewardship Program — sponsored by the Pennsylvania Bureau of Forestry and the USDA Forest Service — provides private forestland owners with information and assistance to promote healthy and productive forests. For more information call (814) 863-0401 or 1-800-235-WISE (toll free) or write to: Forest Resources Extension; The Pennsylvania State University; 7 Ferguson Building; University Park, PA 16802.

Tree Identification

- In this presentation you will learn to identify trees using the *Summer Key to Pennsylvania Trees*.
- Trees can be identified using many factors including leaves, bark, twigs, buds, flowers, and fruits.

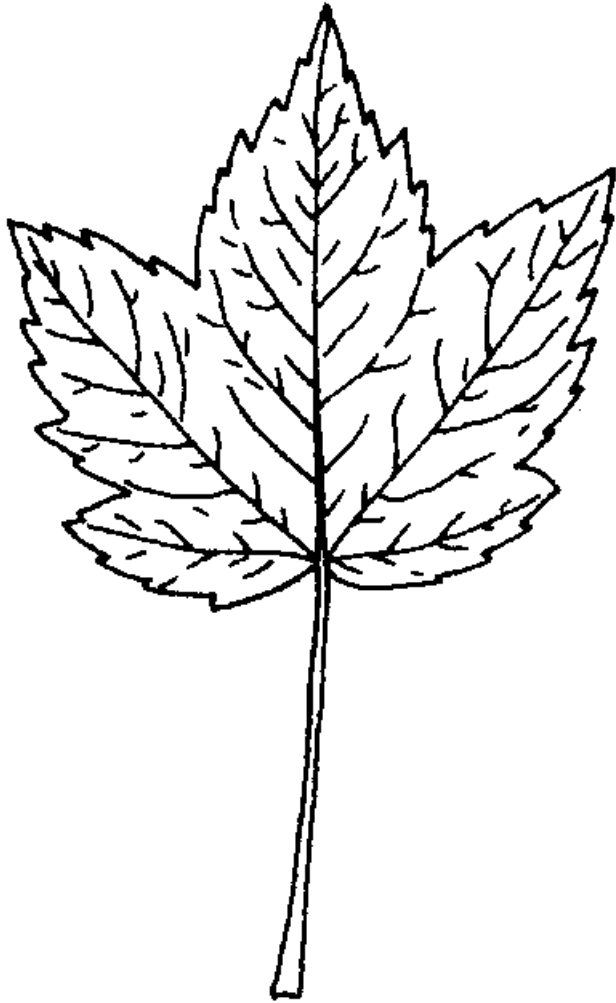
This presentation will focus on using leaves for tree identification. The next several slides will familiarize you with the terminology needed to use the *Summer Key to Pennsylvania Trees*.

Leaf Types



Scale-like

Scale-like leaves are thin, flat and closely appressed to the branchlets as in the Arbor-vitae or Northern white-cedar. **Note:** This illustration shows several leaves.



Broad and flat

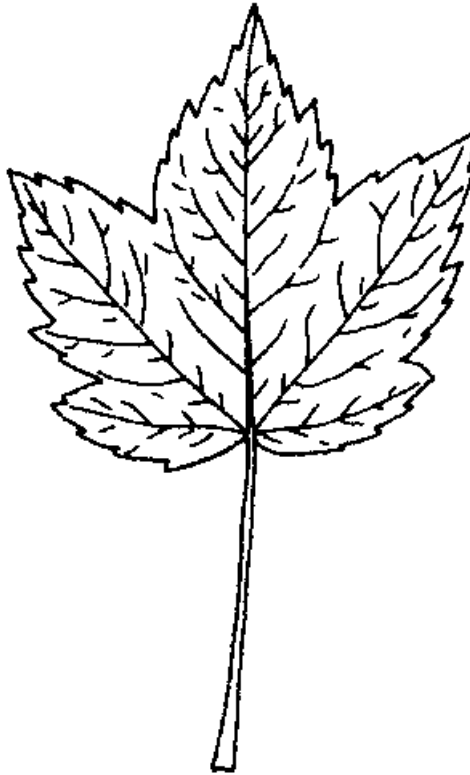
Characteristic of many deciduous species.



Needles

For the purpose of the identification key, needles can be sharp as in pines and spruces or more blunt as in Eastern Hemlock.

Leaf-type Comparison



All three leaf types for comparison

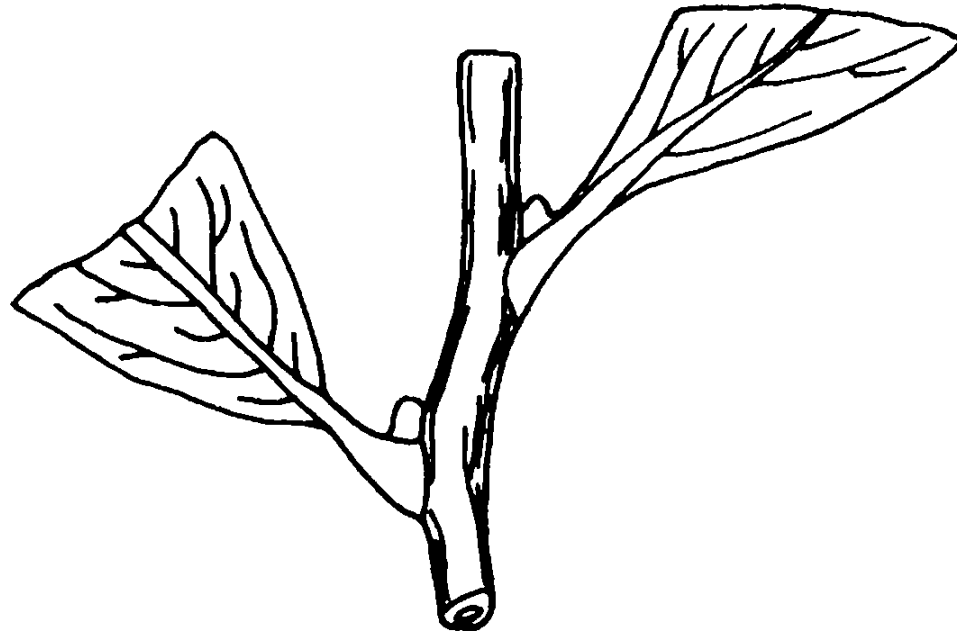
Left – Scale-like

Middle – Broad and flat

Right - Needles

Leaf Arrangement

Alternate



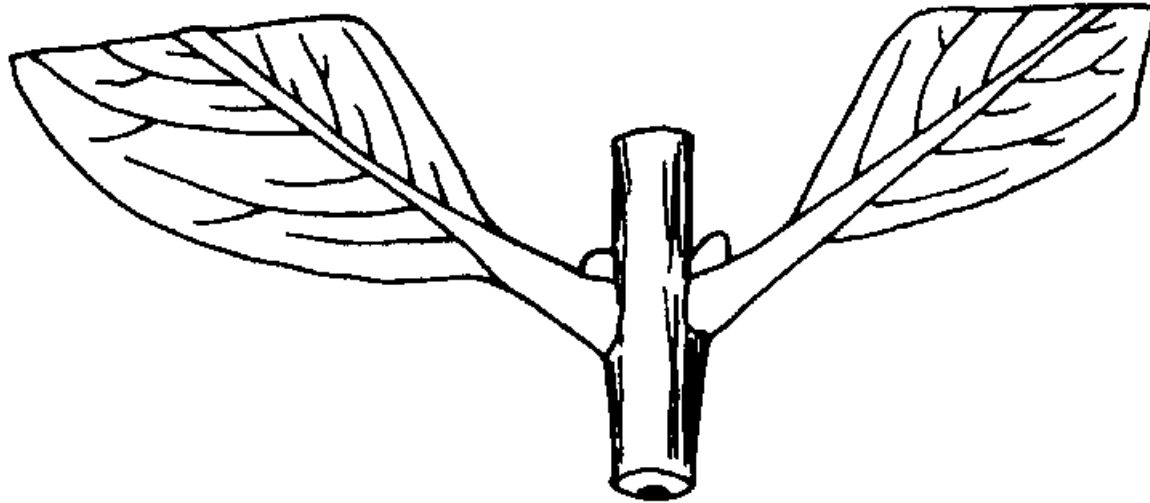
Alternate-leaved:

The points of attachment of the petioles (leaf stalks) are staggered along the stem.

Petioles (leaf stalks) do not attach to the stem directly across from each other.

The bud is at the junction of the twig & leaf petiole. These buds will remain after leaves drop, helping you recognize the leaf arrangement (alternate, opposite, or whorled).

Opposite

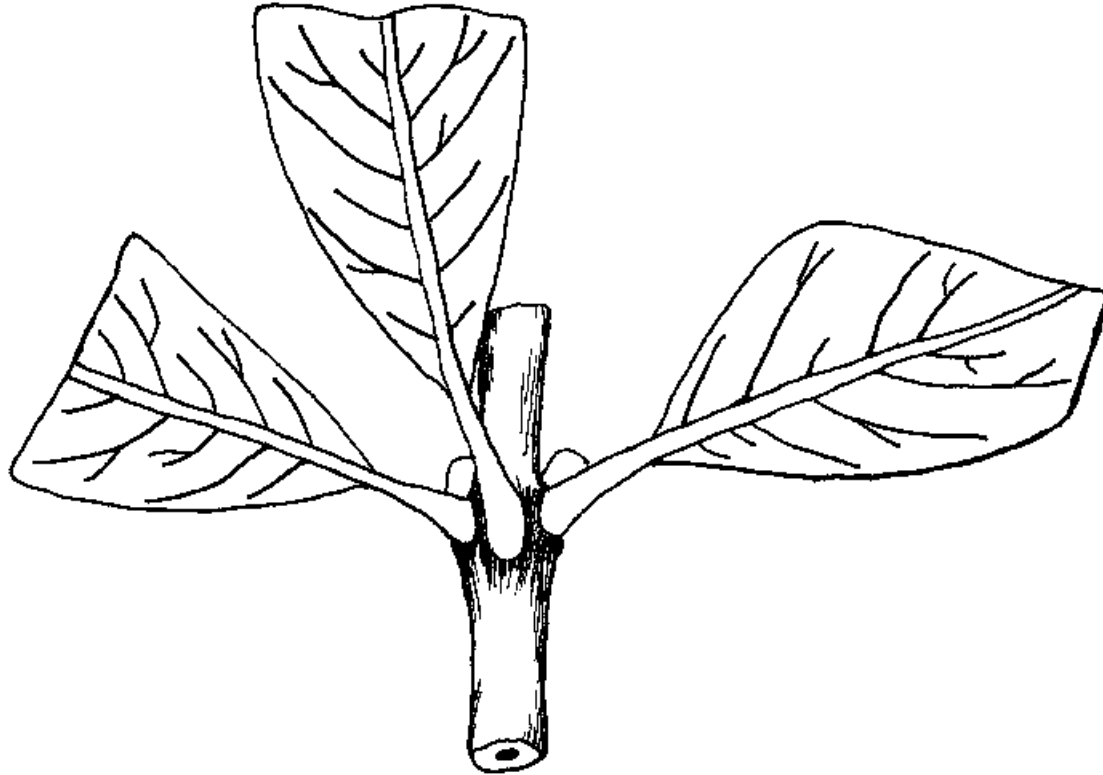


Opposite-leaved:

Having two leaves attach to the stem directly across from each other.

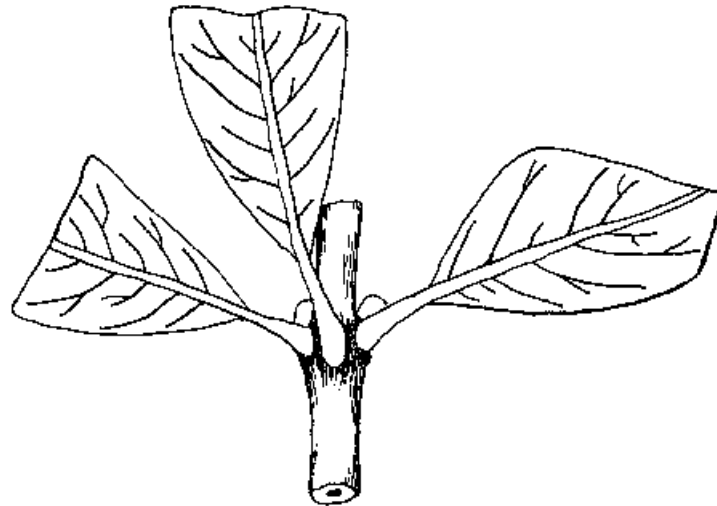
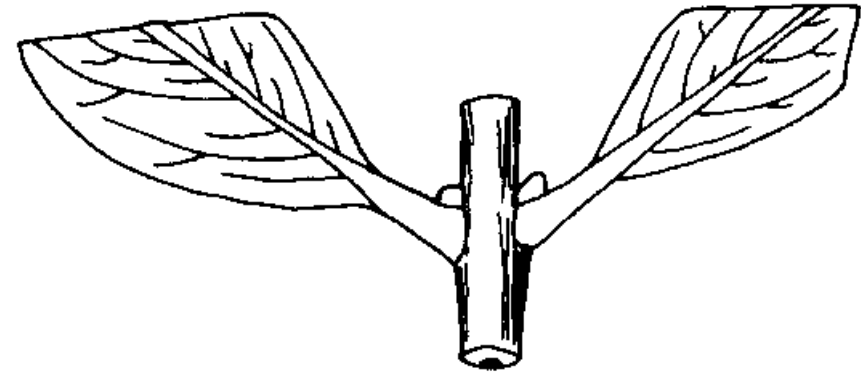
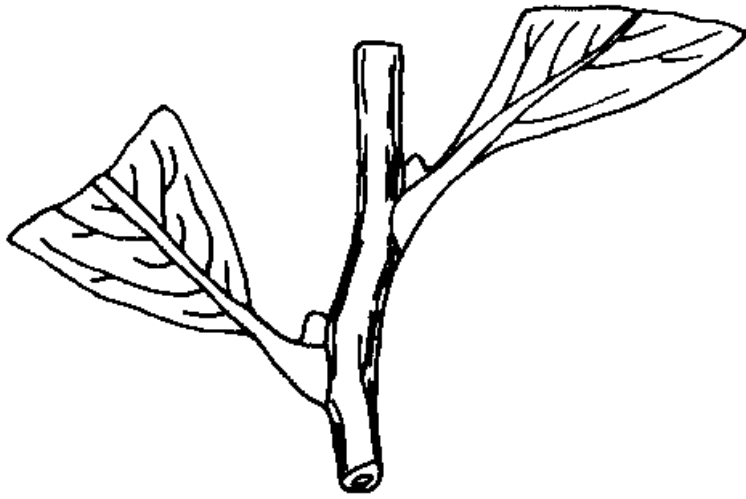
The buds, again, are at the junction of the leaf & twig.

Whorled



Whorled leaves:

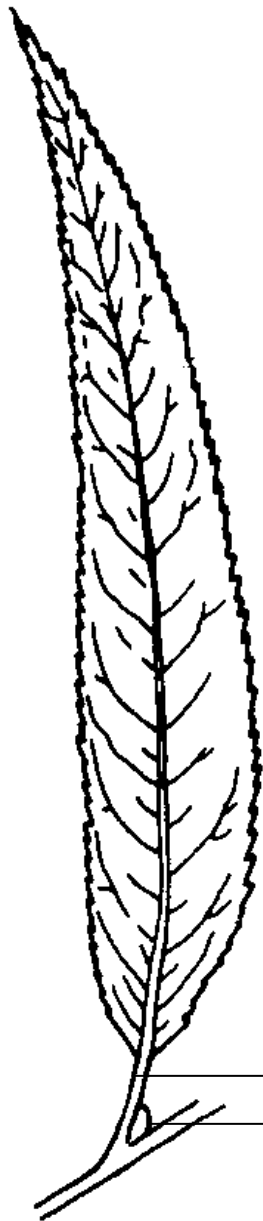
Having three or more leaves attach at the same point along the stem.



Comparison slide: Top left: alternate Top right: opposite
Center bottom: whorled

Leaf Structure

A simple leaf



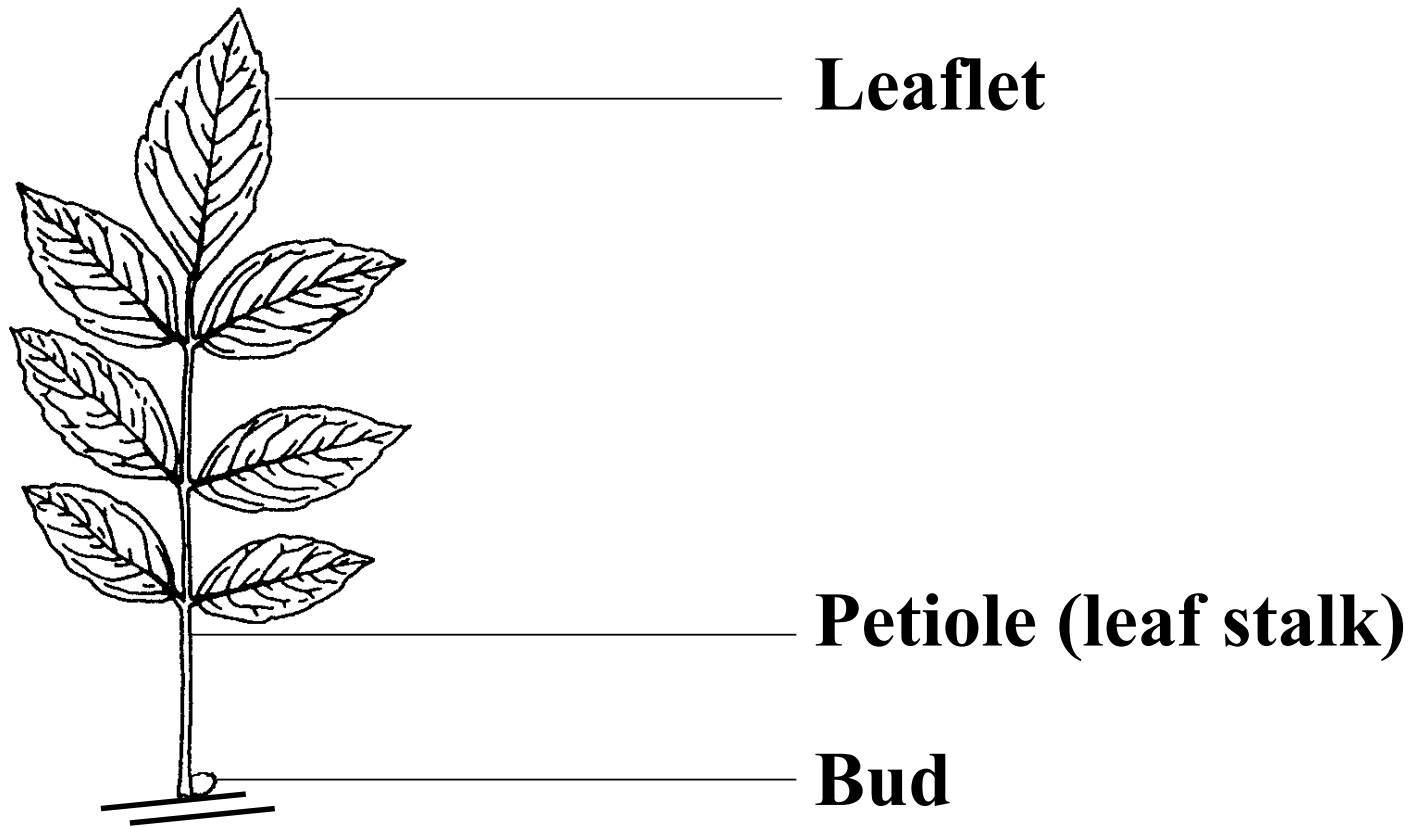
Petiole (leaf stalk)

Bud

Simple Leaf:

Not divided into leaflets, which we'll see shortly. The bud that occurs along the stem where the leaf attaches indicates whether the leaf is simple or compound. (In a compound leaf, there is no bud at the base of the individual leaflets.)

A Compound Leaf

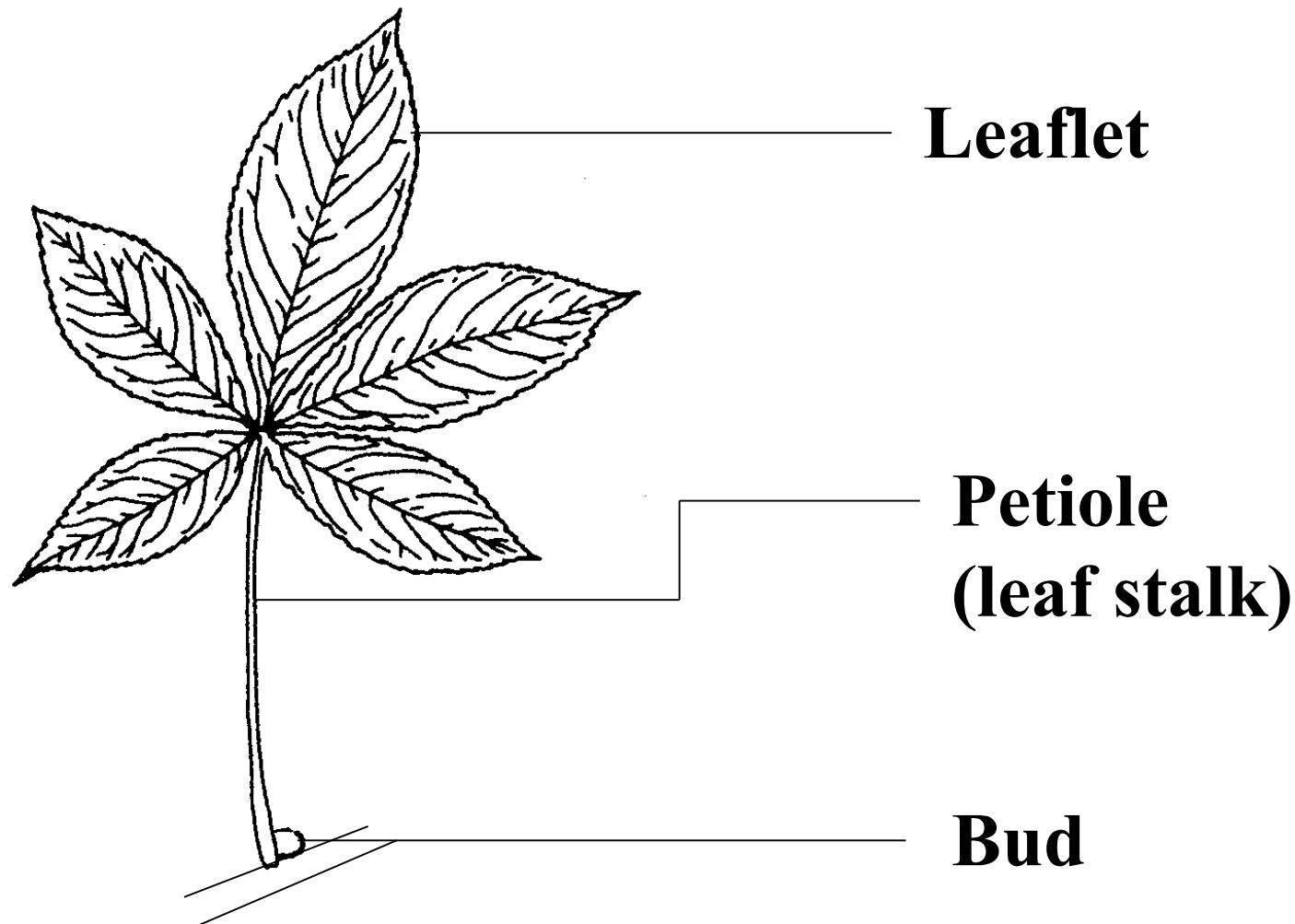


Pinnately compound

Compound leaf:

A leaf that is divided into leaflets. Notice there is only one bud here: thus, only one leaf with seven leaflets. This figure is pinnately compound; having leaflets arranged on opposite sides of an elongated axis. Note: The bud actually occurs along the twig, near where the leaf stalk attaches, and not on the leaf stalk itself.

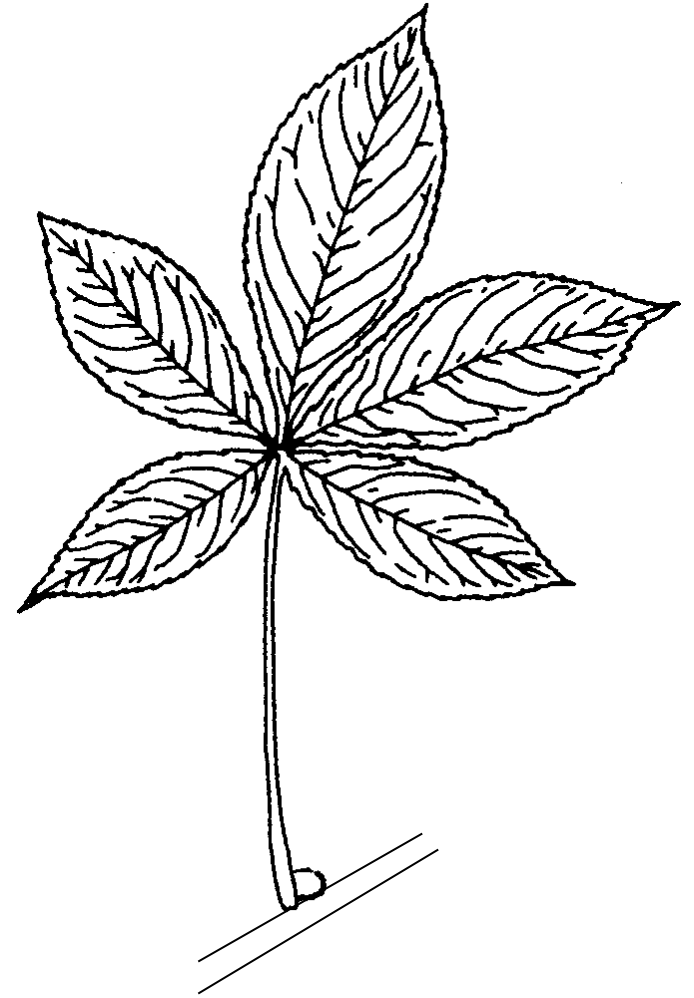
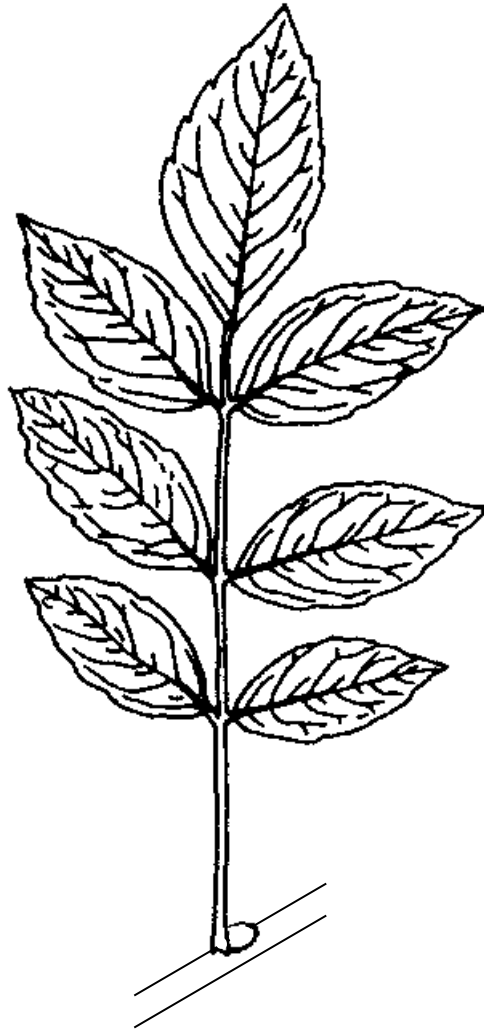
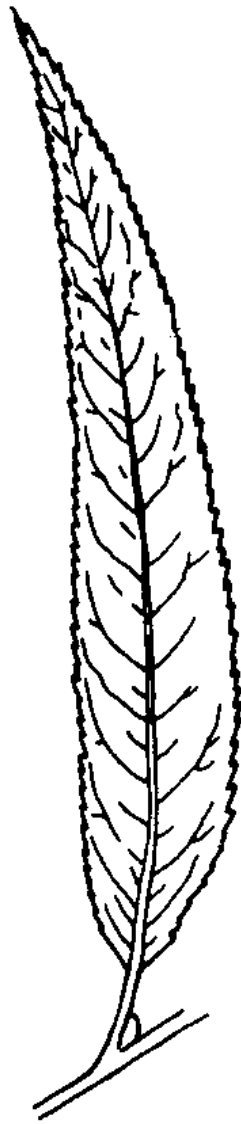
A Compound Leaf



Palmately compound

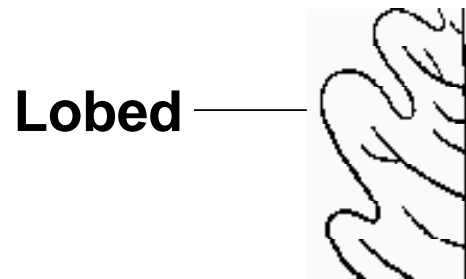
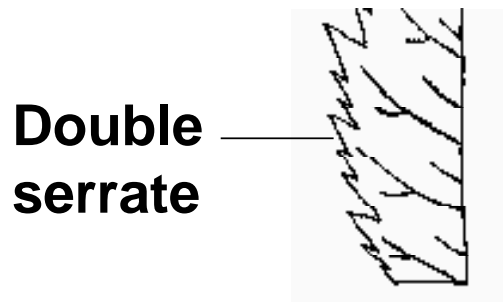
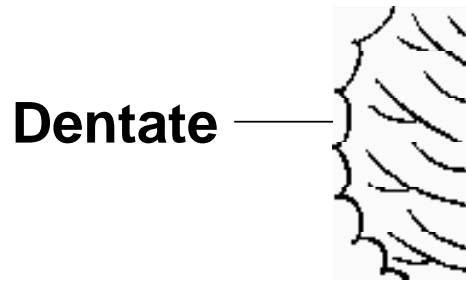
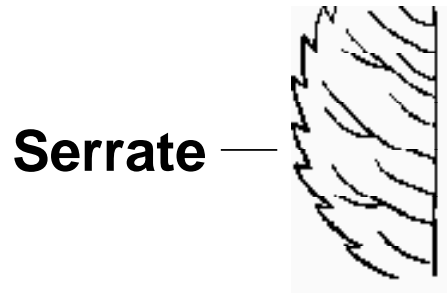
Compound Leaf:

This is an example of a palmately compound leaf; leaflets all attach near a common point, resembling the fingers of a hand. Note: There is only one bud here; thus, there are five leaflets that make up one leaf.



Left – simple leaf **Center** – pinnately compound leaf **Right** – palmately compound leaf

Leaf margins



Entire

Leaf Margins:

The edges or margins of the leaf are also used in identification.

Serrate leaves- margin with sharp forward directed teeth

Double serrate leaves- each sharp, forward directed tooth bears small teeth

Dentate leaves- margin with sharp teeth that point directly outward

Lobed leaves- margin with relatively large, rounded projections (memory aid: think of ear lobe)

Entire leaves- margin without teeth or lobes

Identification Section

The rest of this program uses the *Summer Key for Pennsylvania Trees*.

Note: There are three errors in any key dated earlier than 2002; look for date at the bottom right of the last page of the key. **6b** should read: “Needles without stalks,” rather than “Needles with stalks.” **33b** should read: “Leaves rough or hairy,” rather than “Leaves rough and hairy.” **40a** should read: “Terminal leaflet usually larger than other leaflets,” rather than “Terminal leaflet much larger than other leaflets.”



Hint: opposite

Red Maple

Key Guide: 1b – 12a – 13a – 14a – 15b

Red Maple

Acer rubrum



Leaves: Opposite, simple, with 3-5 shallow lobes, coarsely toothed, light green above, pale green to whitish beneath, turning brilliant red or orange in autumn.

Red Maple

Red Maple:

Leaves: Opposite, simple, with 3-5 shallow lobes, coarsely toothed, light green above, pale green to whitish beneath, turning brilliant red or orange in autumn.

Twigs: Slender, glossy; at first green, later red to reddish-brown.

Fruit: Wings usually less than 1" long, spreading at a narrow angle, red to brown, maturing in May or June.

Bark: Smooth and light gray on young trunks and branches; older trunks darker, shaggy, and roughened with long irregular peeling flakes.

General: Found throughout PA in a wide variety of habitats, typically reaching 50' high, sometimes over 100'. It grows best in wet soils. Also known as soft maple because its wood is not as hard as sugar maple. Young trees are heavily browsed by deer and rabbits, with rodents consuming the seeds.





Hint: opposite

Sugar Maple

Key Guide: 1b – 12a – 13a – 14a – 15b

Sugar Maple

Acer saccharum



Leaves: Opposite, simple, 5-lobed with a few large teeth, about 4" wide, bright green above, pale green below. Leaves turn bright yellow, orange, or red in autumn.

Sugar Maple

Sugar Maple:

Leaves: Opposite, simple, 5-lobed with a few large teeth, about 4”

wide, bright green above, pale green below. Leaves turn bright yellow, orange, or red in autumn.

Twigs: Reddish brown to light brown. Buds brown and sharp-pointed.

Fruit: Horseshoe-shaped with wings almost parallel, maturing in autumn, sometimes persisting into winter.

Bark: Gray-brown, smooth on young trunks, older trunks fissured with long, irregular flakes.

General: Also called rock maple for its hard wood, this important timber tree is found on moist wooded slopes throughout PA, reaching heights of 60’-80’. The wood is used for furniture, musical instruments and flooring, and the sap is collected for maple syrup production. Birds and rodents eat the seeds. Deer, squirrels, porcupine and other mammals browse the twigs, buds, and bark.





Hint: opposite

Flowering Dogwood

Key Guide: 1b – 12a – 13a – 14a – 15a

Flowering Dogwood

Cornus florida



Leaves: Opposite, simple, 3"-5" long; clustered towards tips of twigs; margins smooth or wavy; veins prominent and curved like a bow. Foliage bright red in autumn.

Flowering Dogwood



Flowering Dogwood:

Leaves: Opposite, simple, 3"-5" long; clustered towards tips of twigs; margins smooth or wavy; veins prominent and curved like a bow. Foliage bright red in autumn.

Twigs: Red tinged with green, often with a bluish white waxy coating; marked with rings; tips curve upward. End leaf bud covered by two reddish scales; side leaf buds very small, flower buds conspicuous, silvery, turban-shaped, at ends of twigs.

Fruit: An egg-shaped drupe, 1/2" to 3/5" long; coat red; flesh yellowish; stone grooved, two-celled; usually in clusters of 2-5; persist after the leaves fall. Flowers greenish white or yellowish, small, in flat-topped clusters; four showy white bracts underneath; open before the leaves.



Hint: alternate

Northern Red Oak

Key Guide: 1b – 12b – 18a – 19b – 22a – 23b – 24b - 25b – 26a – 27b

Northern Red Oak

Quercus rubra

Leaves: Alternate, simple, 4"-9" long, to 6" wide, with 7-11 bristle-tipped lobes, sinuses between lobes extend half-way to the mid rib. Smooth, dull green above, paler with small tufts of reddish-brown hair in vein-axils (i.e., where the side veins join the mid-rib) beneath.



Northern Red Oak

Northern Red Oak:

Leaves: Alternate, simple, 4"-9" long, to 6" wide, with 7-11 bristle-tipped lobes, sinuses between lobes extend half-way to the mid rib. Smooth, dull green above, paler with small tufts of reddish-brown hair in vein-axils (i.e., where the side veins join the mid-rib) beneath.

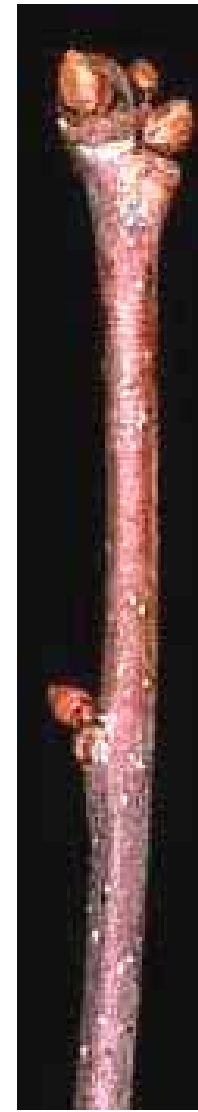


Twigs: Greenish-brown to reddish-brown, smooth when mature. Buds pointed, light brown, smooth.

Fruit: An acorn, $\frac{3}{4}$ " to $1 \frac{1}{4}$ " long; the cup shallow, saucer shaped, covering $\frac{1}{4}$ of the nut, cup-scales reddish-brown, narrow, tight, sometimes fuzzy on the edges. The acorns ripen in two growing seasons; the kernel is bitter.

Bark: Smooth and greenish-brown or grey, maturing to dark grey or nearly black and is divided into rounded ridges.

General: A dominant forest tree throughout the state growing up to 90' in moist to dry soils. Deer, bear, and many other mammals and birds eat the acorns. The hard, strong wood is used for furniture, flooring, millwork, railroad ties and veneer. The "red oak group" includes all oaks with bristle-tipped leaves and acorns that ripen over two seasons.



Hint: alternate

White Oak:

Key Guide: 1b – 12b – 18a – 19b – 22a – 23b – 24b – 25b – 26a – 27a

White Oak

Quercus alba



Leaves: alternate, simple, 6"-9" long, and 4" wide, with 6-10 rounded lobes; bright green above, paler below, both surfaces smooth on mature leaves.

White Oak

White Oak:

Leaves: alternate, simple, 6"-9" long, and 4" wide, with 6-10 rounded lobes; bright green above, paler

below, both surfaces smooth on mature leaves.

Twigs: red-grey, often with a grayish coating. Buds rounded, reddish-brown, smooth, to 1/8" long; end buds clustered.

Fruit: an acorn, about 1" long, light brown, cup bowl like, hairy inside, enclosing 25% of the nut; cup scales warty at the base. Acorns ripen in one season in September.

Bark: Pale grey, scaly, not deeply fissured, often flaky.

General: a dominant forest tree on dry to moist sites, occurring throughout the state, usually reaching 80'-100' high. This tree is very important to both wildlife and people. The acorn is an important food for animals. Eastern Native Americans made a flour from them. Commercial uses include flooring, whiskey barrels and boat building. The famous Revolutionary War frigate *USS Constitution*, "Old Ironsides," was made of White oak. The "white oak group" includes all oaks without bristle-tipped lobes and acorns that ripen in one season.



White Oak

Red Oak

White oak group -vs- Red oak group.
Notice the difference between the rounded lobes of the White oak

compared to the pointed lobes of the Red oak.

Acorn – notice the White oak cup more bowl like as compared to the Red oak being more saucer like. In this particular picture the white oak acorns are not fully mature. White oak acorns mature in one season, while Red oak acorns take two seasons to mature.





Hint: alternate

American Beech

Key Guide: 1b – 12b – 18a – 19b – 22b – 28a – 29b

American Beech

Fagus grandifolia



Leaves: alternate, simple, 3-4" long, stiff leathery texture, with a tapered tip and sharply-toothed margins, light green and glossy above, yellow-green below.

American Beech

American Beech:

Leaves: alternate, simple, 3-4" long, stiff leathery texture, with a tapered tip

and sharply-toothed margins, light green and glossy above, yellow-green below.

Twigs: slender; dark yellow to gray; at first hairy, later smooth; zigzag.

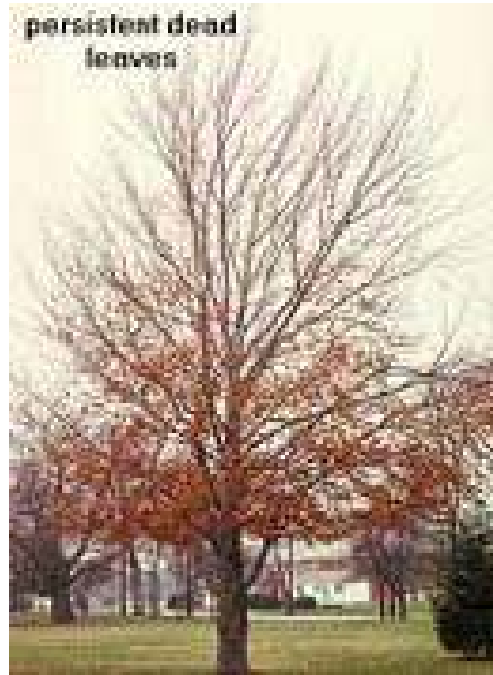
Buds very long,

slender, sharp pointed, and covered by 10 – 20 reddish-brown scales.

Fruit: a stalked, prickly 4-valved bur containing triangular, pale-brown, shining nuts.

Bark: smooth, light gray, mottled with dark spots.

General: found on moist, rich soils throughout its range; more abundant in the north. An important timber species typically reaching 50 – 60' high but can grow taller. Beechnuts are a very important source of food for wildlife including bears, squirrels, and grouse; however, species produces good crops infrequently, every five to seven years. Beech is a handsome shade tree for large open areas in parks and golf courses.





Hint: alternate / hairy

Yellow Birch

Key Guide: 1b – 12b – 18a – 19b – 22b – 28b – 30b – 31b – 33b – 35b – 37a

Yellow Birch

Betula alleghaniensis



Leaves: Alternate, simple, 3"-4" long, doubly-toothed margins, dull-green above, yellow-green beneath.

Yellow Birch

Yellow Birch:

Leaves: Alternate, simple, 3"-4" long, doubly-toothed margins, dull-green above, yellow-green beneath.

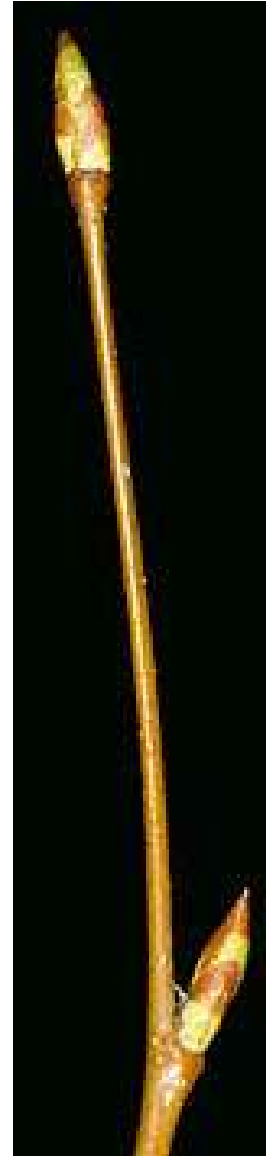
Twigs: Green and hairy when young later brown and smooth, with only a faint wintergreen flavor and smell. Buds dull yellowish green, slightly downy.

Fruit: An erect, very short-stalked cone, 1 ½" long, made up of small, winged nuts and scales.

Bark: Young stems and branches yellowish or bronze and shiny, peeling off in thin papery strips. Older trunks becoming reddish-brown and breaking into large, ragged-edged plates.

General: A medium to large tree, usually 60'-75' occasionally to 100'. Prefers moist, cool soils and cool summer temperatures, often found on north-facing slopes and swamps. The wood is used for cabinets, furniture, flooring, and doors. It was a principal wood used for distilling alcohol, acetate of lime, tar, and oils. Ruffed grouse feed on buds and seeds, deer and rabbits browse the twigs.





Hint: alternate/hairy

Sweet (Black) Birch

Key Guide: 1b – 12b – 18a – 19b – 22b – 28b – 30b – 31b – 33b –

Sweet (Black) Birch

Betula lenta



Leaves: alternate, simple, about 3 ½” long, unevenly saw-toothed, dull green above, yellow-green beneath with some white hairs where the veins join the midrib. The leaf base is usually heart-shaped.

Sweet (Black) Birch

Sweet Birch:

Leaves: alternate, simple, about 3 ½” long, unevenly saw-toothed, dull green above, yellow-green beneath with some white hairs where the veins join the midrib. The leaf base is usually heart-shaped.

Twigs: green and somewhat downy when young, becoming reddish-brown, smooth and shiny.

They have a strong wintergreen flavor and smell. Buds reddish-brown, conical, sharp-pointed and shiny.

Fruit: a very small, winged nut. As in other birches, nuts together with small scales, form a cone-like structure, about 1 ½” long.

Bark: tight, dark reddish-brown on younger trees, marked with horizontal lines of pale lenticles and often resembles the bark of young Black cherry. On older trees the bark breaks into large black plates.

General: Also known as Black birch or Cherry birch, this tree normally attains heights of 50’ to 60’, and is found on a variety of sites from rich fertile lowlands to rocky ridges throughout the state. The heavy, hard, strong wood is used for furniture, boxes, and fuel-wood.

Distillation of the bark and twigs produces an oil of wintergreen. Fermented sap can be used to make birch beer. Ruffed grouse feed on buds and seeds; deer and rabbits browse the twigs.





Hint: alternate; hairy

Paper Birch

Key Guide: 1b – 12b – 18a – 19b – 22b – 28b – 30b – 31b - 33b – 35b – 37a

Paper Birch

Betula papyrifera



Leaves: alternate, simple, 2-3" long, 1 ½" – 2" wide, upper surface dark green, lower surface light green, narrowed or rounded at the base, sharply-toothed margins and sharp-pointed tip.

Paper Birch

Paper Birch:

Leaves: alternate, simple 2 - 3" long, 1 ½ - 2" wide, upper surface dark green, lower surface light green, narrowed or rounded at the base, sharply-toothed margins and sharp-pointed tip.

Twigs: at first greenish and hairy, later becoming smooth reddish-brown.

Fruit: a cylindrical, short-stalked strobile about 1 ½" long. The seeds are small and winged.

Bark: trunk and older branches chalky to creamy white, marked with horizontal stripes and peeling off in thin layers. Older trunks rough and often fissured into irregular thick scales.

General: a large tree to 50 – 70' tall on upland woods and slopes in north-central and northeastern PA. Seeds and buds are eaten by the state bird, the Ruffed grouse. Twigs are browsed by deer. Native Americans used the bark for constructing canoes, shelters and containers.





Eastern Hemlock
Key Guide: 1a – 2b – 4a – 5a – 6a

Eastern Hemlock

Tsuga canadensis



Leaves: Evergreen needles occur singly, appearing two-ranked on twigs, flattened, about ½” long, dark green and glossy above, light green with two white lines below.

Eastern Hemlock

Eastern Hemlock:

Leaves: Evergreen needles occur singly, appearing two-ranked on twigs, flattened, about ½” long, dark green and glossy above, light green with two-white lines below.

Twigs: Slender, tough, yellowish-brown to grayish-brown. Buds egg-shaped, 1/16” long, reddish-brown.

Fruit: Cones ¾” long, egg-shaped, hanging singly from the tips of the twigs. Under each scale are two small, winged seeds.

Bark: Flaky on young trees, gray-brown to red-brown; thick and roughly grooved when older.

General: A large, long-lived tree, important for construction timber and as a source of tannic acid for tanning leather. Found in cool, moist woods throughout the commonwealth, Eastern hemlock is the official state tree of Pennsylvania. Ruffed grouse, wild turkey, and songbirds find food and shelter in this tree. Deer browse it heavily when deep snow makes other foods scarce.





Eastern Redcedar
Key Guide: 1a – 2a – 3a

Eastern Redcedar

Juniperus virginiana



Mature Leaves (photo on right): evergreen; opposite, in four rows forming slender, four-angled twigs; 1/16" long to 3/8" long on leaders. Scalelike, not toothed, dark green with gland dot.

Immature leaves (photo on left): needlelike, pointed.

Eastern Redcedar

Eastern Red Cedar:

Leaves: evergreen; opposite, in four rows forming slender, four-angled twigs; 1/16" long, to 3/8" on leaders. Scale-like, not toothed; dark green with gland dot. Immature leaves needlelike, pointed.

Bark: reddish-brown; thin, fibrous, and shreddy.

Fruit: 1/4 - 3/8" in diameter; berrylike; dark blue with a bloom; soft, juicy, sweetish, and resinous; 1-2 seeds.

General: evergreen, aromatic tree growing 40 – 60' in height with a diameter of 1 - 2'. Lives from dry uplands, especially limestone, to flood plains and swamps; also abandoned fields and fence rows; often in scattered pure stands.





Hint: leaves do not have stalks

Balsam Fir

Key Guide: 1a – 2b – 4a – 5a – 6b

Balsam Fir

Abies balsamea



Leaves: Evergreen; 1-1 ½" long. Spreading almost at right angles in two rows on hairy twigs; curved upward on upper twigs; flat, with rounded tip. Shiny, dark green above, with two-narrow, whitish bands beneath.

Balsam Fir



Balsam Fir:

Bark: Brown, thin, smooth, with many resin blisters, becoming scaly.

Fruit: Cones 2-3 ¼" long; cylindrical; green tinged & dark purple; upright on topmost twigs. Scales finely hairy, bracts mostly short and hidden; paired long-winged seeds.

General: The only fir native to the Northeast, with narrow, pointed, spirelike crown of branches and aromatic foliage. Generally grows 40-60'. A major pulpwood species. Also used for interior knotty pine paneling. Christmas trees, wreaths, and pillows utilize the sweet smelling foliage. Deer browse in winter.



Norway spruce:
Key Guide: 1a – 2b – 4a – 5b

Norway Spruce

Picea abies



Leaves: Evergreen, stiff, 1/2 to 1" long. Needles are 4-angled but somewhat flattened, with a sharp-pointed tip, shiny green.

Norway Spruce

Norway Spruce:

Leaves:

Evergreen, stiff, 1/2 to 1" long. Needles are 4-angled, but somewhat flattened, with a sharp-pointed tip, shiny green.

Twig: Slender to medium in size, lacking hair, orangish brown.

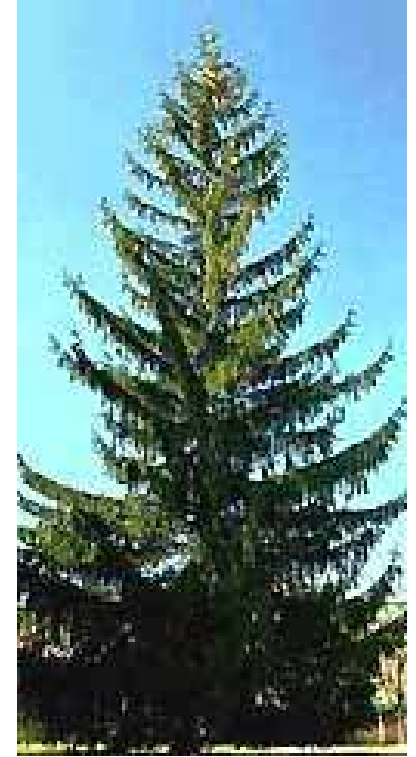
Needles are borne on woody pegs.

Fruit: Cones are very large, cylindrical, 4 to 6 inches long, with stiff scales that are irregularly toothed. Turning brown and maturing September to November.

Bark: Red-brown and scaly, later turning gray with flaking scales or plates.

Flower: Males yellow-brown in large groups; females upright, purple.

General: A European species that has become a valuable naturalized member of our forests, and extensively planted as an ornamental. A large tree with a dense conical crown. Branchlets on older trees droop. Wood used chiefly for paper pulp, boxes, crates, and lumber.



Balsam Fir



Norway Spruce



Comparing firs and spruces.

Two differences are twigs and needles:

Twigs:

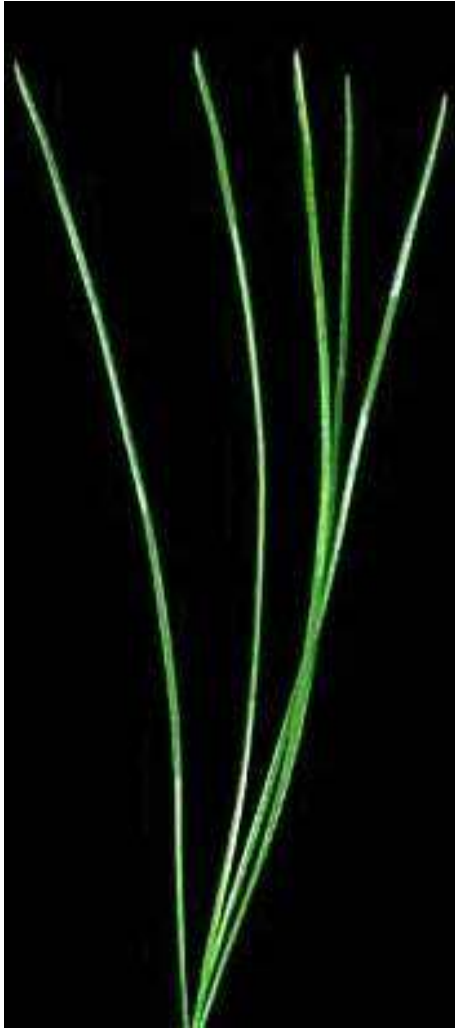
Fir- Twigs smooth or nearly smooth

Spruce – Twigs roughened by peg-like leaf bases that remain on the twigs after the needles fall

Needles:

Fir – Needles softer, flattened, and usually bluntly rounded at tip

Spruce – Needles stiff, 4-sided, pointed at tip



(one bundle)

Eastern White Pine:

Key Guide: 1a – 2b – 4b – 7a – 8a

Eastern White Pine

Pinus strobus



Leaves: Evergreen needles in clusters of five; soft & flexible; 3-sided, 2 ½ -5” long, and bluish-green. This is the only pine native to Pennsylvania with five needles per bundle.

Eastern White Pine

Eastern White Pine:

Leaves: Evergreen needles in clusters of five; soft & flexible; 3-sided, 2 ½ -5” long, and bluish-green. This is the only pine native to Pennsylvania with five needles per bundle.



Twigs: Slender, flexible, with rusty hairs when young, later smooth. Buds egg-shaped, usually less than ½” long, gray-brown.

Fruit: Cones 5”-8” long, without prickles, slightly curved, resinous; each scale usually bears two winged seeds as do all our native pines.

Bark: Young trunks and branches greenish-brown, later darker, grooved, and scaly.

General: Eastern white pines are large trees. At present they usually reach 50- 90’ high. “Penn’s Woods” once saw white pines reaching 150’ and more. It is one of the most valuable softwood timber trees, found in moist or dry woodlands throughout the state, and often planted as an ornamental in large open areas. Many types of wildlife feed on the seeds and soft needles. The inner bark is the preferred winter food of the porcupine; deer browse the twigs.



Hint: opposite

Horse Chestnut

Key Guide: 1b – 12a – 13a – 14b – 16b

Hint: leaf is palmately compound.

Horse Chestnut

Aesculus hippocastanum



Leaves: opposite, palmately compound, with leaf stalks 3-7" long. Usually 7-9 leaflets, (sometimes five); saw-toothed. Dull, dark green above, paler beneath.

Horse Chestnut

Horse Chestnut:

Description:

Introduced shade tree with spreading,

rounded crown of stout branches and course foliage.

Leaves: opposite, palmately compound, with leaf stalks 3-7" long. Usually 7-9 leaflets, (sometimes five); saw-toothed.



Dull, dark green above, paler beneath.

Twigs: light brown; stout; hairless; ending in large, blackish, sticky bud.

Fruit: Maturing in late summer; a brown spiny capsule, 2-2 ½" in diameter, splitting into two to three parts; 1-2 brown poisonous seeds.

Bark: Gray or brown; thin and smooth, becoming fissured and scaly.

General: Horse chestnut is a shade and street tree that likes rich, moist soils. It is easily propagated from seed and tolerant of city conditions.



**Hint: needles more
than 3 inches long**

Red pine:

Key Guide: 1b – 2b – 4b – 7a – 8b – 9b – 10a – 11b

Red Pine

Pinus resinosa



Leaves: Evergreen needles in clusters of two, slender, 4"-6" long, dark green, borne in dense tufts at the ends of branchlets; snap easily when bent double.

Red Pine

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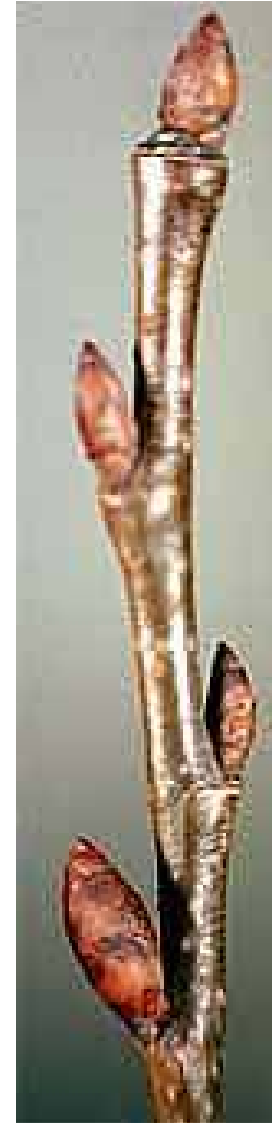
Twigs: Stout, ridged, yellow-brown to red-brown, buds egg-shaped, about 1/2" long, brown at first and later silvery.

Fruit: A cone, about 2" long, without prickles, nearly stalkless, remains attached until the following year.

Bark: Comparatively smooth, reddish-brown.

General: Like White pine, this medium to large sized tree develops one horizontal whorl of side branches each year. A valuable softwood timber tree in the northern part of the State, its wood is used chiefly for construction lumber. Native on dry slopes in Luzerne, Wyoming, Tioga, and Centre counties and planted extensively by the Bureau of Forestry and the Pennsylvania Game Commission. Songbirds, mice and chipmunks feed on the seeds.





Hint: leaves rough

American Elm:

Key Guide: 1b – 12b – 18a – 19b – 22b – 28b – 30b – 31b - 33b – 35a - 36a

American Elm

Ulmus americana



Leaves: alternate, simple, 4"-6" long, unequal at the base, rather rough at the upper surface; usually soft-hairy below; veins prominent; margin coarsely toothed. Petiole short.

American Elm

American Elm:

Leaves: alternate, simple, 4"-6" long, unequal at the base, rather rough on the upper surface; usually soft-hairy below; veins prominent; margin coarsely toothed. Petiole short.

Twigs: slender, zigzag, brown, slightly hairy. Leaf buds 1/8"- 1/4" long, flattened. Flower buds larger, below leaf buds. Bud scales red-brown, smooth or downy; margins dark.

Fruit: a seed surrounded by an oval, thin papery wing, 1/2" long, deeply notched at the tip; ripening in spring and borne in clusters; wing with scattered hairs along margin. Flowers and fruit appear before the leaves, as is true of Slippery elm.

Bark: Dark gray to gray-brown with long corky ridges; separated by diamond-shaped fissures on older trees.

General: a large and highly prized shade tree. The drooping crown often gives it a vase-shaped appearance. Found locally throughout Pennsylvania, mainly on moist areas. The hard, tough wood has many uses, including the manufacture of boxes, barrels, and furniture.





Clue: alternate, sap not milky

Bitternut Hickory

Key Guide: 1b – 12b – 18b – 39b – 40a

Note: 40a is not always true

Bitternut Hickory

Carya cordiformis



Leaves: Alternate, compound, 6-10" long, divided into 7-11 lance-shaped leaflets, bright green and smooth above; paler and slightly downy beneath, margins finely to coarsely toothed.

Bitternut Hickory

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Leaves: Alternate, compound, 6-10" long, divided into 7-11 lance-shaped leaflets, bright green and smooth above, paler and slightly downy beneath; margins finely to coarsely toothed.



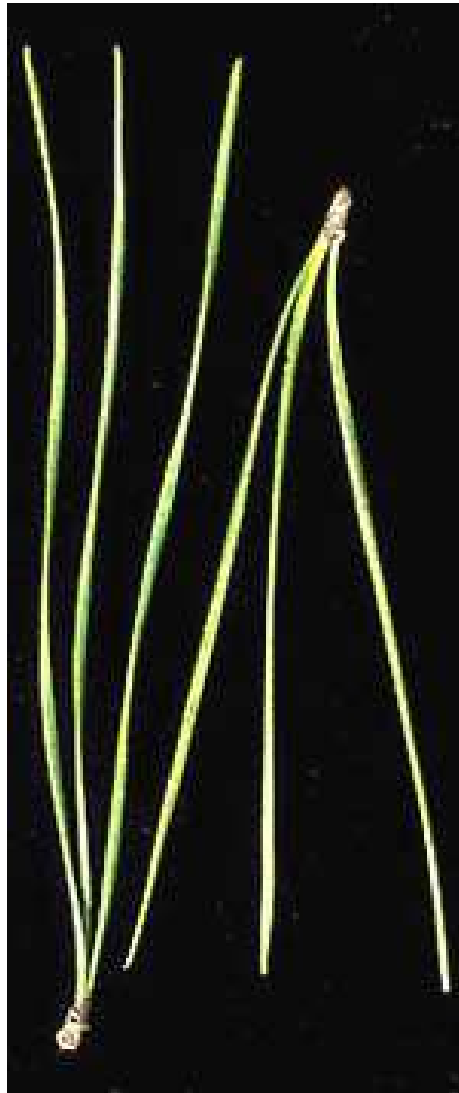
Twigs: Slender, smooth, glossy, orange-brown to grayish with numerous pale lenticels. Buds

covered by four sulphur-yellow, gland-dotted outer scales. End buds flattened, $\frac{3}{4}$ " long.

Fruit: Nearly round, $\frac{3}{4}$ "-1 $\frac{1}{2}$ " in diameter with a thin, yellowish gland-dotted husk, which splits into four sections almost to the middle when ripe. The ridgeless, reddish-brown to gray-brown nut has a thin shell protecting a bitter kernel.

Bark: The tight gray bark remains rather smooth for many years, eventually developing shallow furrows and low, narrow interlacing ridges.



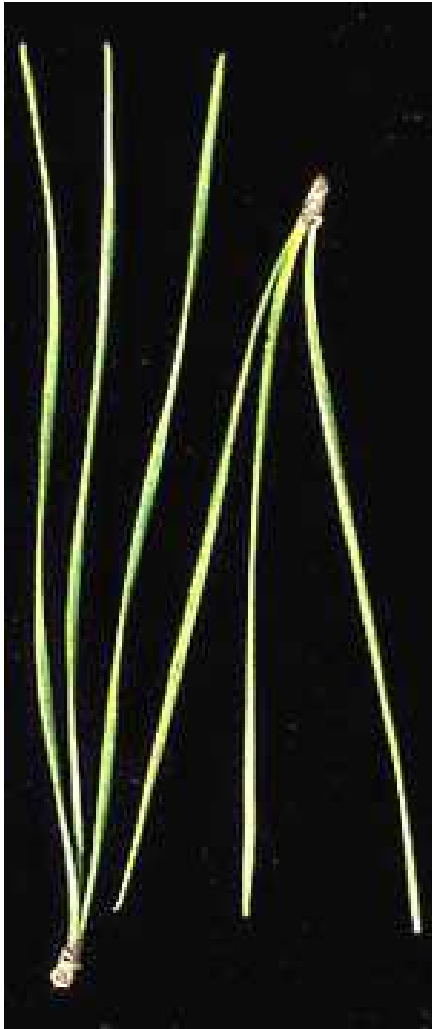


Pitch pine:

Key Guide: 1a – 2b – 4b – 7a – 8b – 9a

Pitch Pine

Pinus rigida



Leaves: Evergreen needles in clusters of three, rarely in clusters of two; stiff, 2" – 5" long, yellowish-green.

Pitch Pine

Pitch Pine:

Leaves: Evergreen needles in clusters of three, stiff, 2" – 5" long, yellowish-green.

Twigs: Stout, brittle, rough, angled in cross-section, golden-brown. Buds egg-shaped, about ½" long, resinous, red-brown.

Fruit: Cones 1" – 3" long with short, stiff prickles, nearly stalkless, often remains attached for five years or more after ripening. Many remain unopened until heated by passing forest fire.

Bark: Green and smooth on young branches; thick, rough, and grayish-brown on older trunks.

General: Pitch pine is a medium sized tree, 40'-50' high. Widespread in Pa except the northwestern counties. It is more common on poor, sandy soils and areas where forest fires have killed most other trees. Its wood has a high resin content, and is used for railroad ties, construction lumber, pulpwood, and fuel. Pitch pine seeds are important to nuthatches, Pine grosbeaks and Black-capped chickadees. Deer and rabbits browse the seedlings.





**Hint: leaf not compound and not hairy,
margins have fine teeth; leaf stalks have
glands.**

Black Cherry

Key Guide: 1b – 12b – 18a – 19b – 22b – 28b – 30b - 31b - 33a – 34a

Black Cherry

Prunus serotina



Leaves: Alternate, simple, 2-5” long; narrow with tapering tip, shiny above, paler below and usually with one or more small glands at the base; margins with short in-curved teeth which distinguish it from other cherries.

Black Cherry

Leaves: Alternate, simple, 2-5" long; narrow with tapering tip, shiny above, paler below and usually with one or more small glands at the base; margins with short in-curved teeth which distinguish it from other cherries.



Twigs: Smooth, reddish-brown, marked with numerous pale, round



lenticles; often covered with a thin gray coating which rubs off easily. Buds smooth, shiny, sharp pointed, reddish-brown tinged with green. When broken, very bitter smelling.

Fruit: Round, black with a purplish tint; 1/3-1/2" in diameter, containing a single, round, stony seed. Arranged in hanging clusters. Flowers white, blooms in June.

General: Commonly 50-70' high, this species grows throughout the state. It thrives in fertile alluvial soil, but also grows well on dry slopes. The hard reddish-brown wood is highly prized for quality furniture and interior trim. Many game birds, song birds, and mammals, including black bear, eat the fruit and seeds.



Hint: sap not milky; leaves hairy

Black Walnut:

Key Guide: 1b – 12b – 18b – 39b – 40b – 41b – 42b – 44b

Black Walnut

Juglans nigra



Leaves: Compound, alternate; leaflets 15 to 23, each 3"-4" long, small-toothed; dark yellow-green above, paler, hairy below. End leaflet absent or very small. Main leaf-stem with very fine hairs.

Black Walnut

Leaves: Compound, alternate; leaflets 15 to 23, each 3"-4" long, small-toothed; dark yellow-green above, paler, hairy below. End leaflet absent or very small. Main leaf-stem with very fine hairs.



Twigs: Stout, orange-brown to dark brown, roughened by large leaf scars, easily broken; pith pale brown, chambered.



Buds gray, downy; side buds 1/6" long, end bud larger.

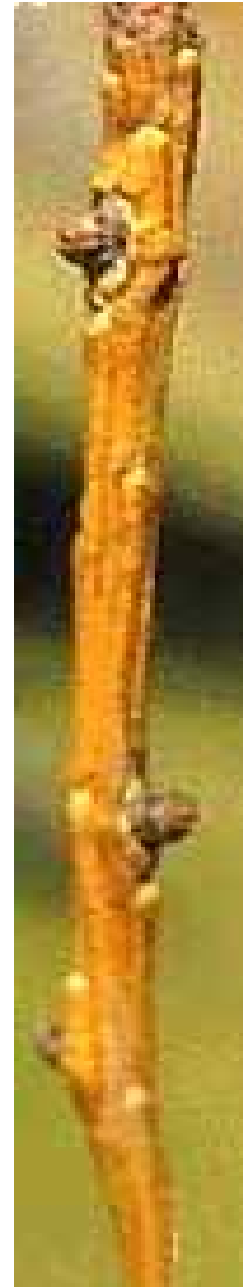
Fruit: a round nut, 1"-2" in diameter, shell rough, covered with a thick, almost smooth, green spongy husk; oily kernel sweet. Flowers in drooping green catkins, appearing with the unfolding leaves, which is also true of butternut.



Bark: dark brown to gray-black, with narrow ridges.



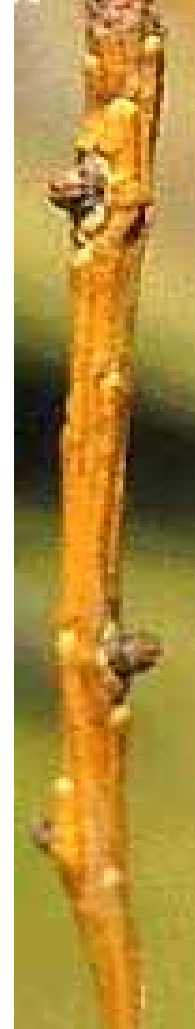
General: a large-sized tree, found locally on rich soils mainly in the southern part of the State. Wood valuable for quality furniture, veneer, gun stocks and musical instruments.



American larch (Tamarack):
Key Guide: 1a – 2b – 4b – 7b

American Larch

Larix laricina



Leaves: Needles not evergreen; occur singly near the ends of the twigs, elsewhere in clusters of ten or more; about 1” long, pale green, turning yellow and falling from the tree during the autumn.

American Larch

American larch (tamarack):

Leaves: Needles not evergreen; occur singly near the ends of the twigs, elsewhere in clusters of ten or more; about 1" long, pale green, turning yellow and falling from the tree during the autumn.

Twigs: At first covered with a bluish-white coating, becoming dull brown and with numerous short spurs. Buds round, small, 1/16" long, dark red.

Fruit: A cone, about one inch long, egg-shaped, upright, often remains attached for several years after ripening in the fall.

Bark: Smooth at first, later becoming scaly, dark brown.

General: A medium-sized tree also known as Eastern larch and Tamarack. Only cone-bearing tree native to Pa that loses its needles annually. Found locally in moist situations. Wood used chiefly for paper pulp, lumber, posts, and railroad ties. European larch (*L. decidua*) and Japanese larch (*L. leptolepis*) are more commonly planted in the State.



Not found in the key



Wild Grape:

This is an informational slide that cannot be worked through the key. Wild grapes are found throughout the State and are present in many hardwood stands, often taking over the canopies of some understory trees.

Wild Grape

Vitis spp.



Leaf: Alternate, simple, cordate, toothed and often lobed

Wild Grape

Leaf: Alternate, simple, cordate, toothed and often lobed.

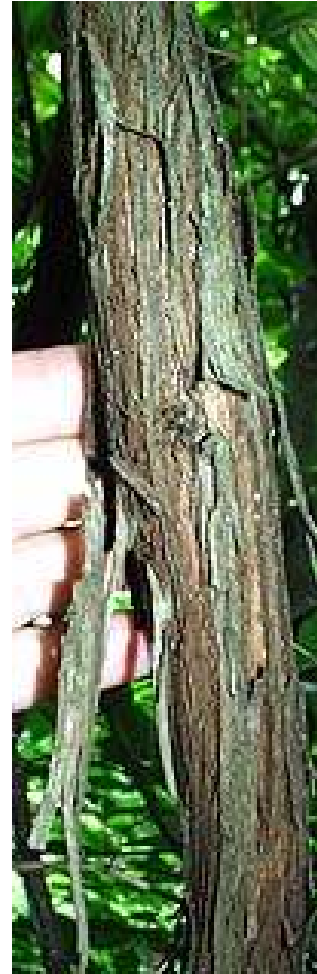
Flower: Green, generally not showy, borne on panicles, appearing in late spring.

Fruit: An edible berry occurring in clusters, usually dark blue or purple at maturity, often with a glaucous bloom. Maturing in autumn.

Twig: Stems are mostly rounded, with rounded buds that have two bud scales. The terminal bud is false. Tendrils grow opposite the leaves and do not have adhesive tips.

Bark: Very flaky, usually red-brown in color, often peels in long strips.

Form: A vine that climbs with its curly tendrils.





White ash:

Key Guide: 1b – 12a – 13a – 14b – 16a – 17b

White Ash

Fraxinus americana



Leaves: Opposite; compound; about 10" long; with five to nine leaflets, each 3" to 5" long, short stalked, silvery beneath, margins entire or with a few rounded teeth toward the tip.

White Ash

Leaves: Opposite; compound; about 10" long; with five to nine leaflets, each 3" to 5" long, short stalked, silvery beneath, margins entire or with a few rounded teeth toward the tip.

Twigs: Stout, usually smooth, gray-brown with a few pale lenticels and a white, waxy coating which is easily rubbed off (called a bloom.) Buds rusty to dark brown, blunt with adjoining leaf scars half-circular and notched at the top. The first pair of lateral buds usually at the base of the end bud causing a terminal enlargement of the twig.

Fruit: A winged seed, called a samara, usually 1" – 2" long and ¼" wide, shaped like a canoe paddle with a rounded tip and hanging in clusters which remain attached for several months after ripening in autumn.

Bark: Gray-brown, evenly furrowed into diamond shaped areas separated by narrow interlacing ridges, slightly scaly on very old trees.

General: A large tree, often up to 80' or more; usually with a long-straight trunk commonly found on rich soils. The wood is used for sporting goods (especially baseball bats), handles, agricultural tools, and furniture. The juice from the leaf has been reported to relieve mosquito bite itching. Fall foliage ranges from brilliant yellow to dark maroon.



Not found in the key



Sycamore:

Sycamore

Platanus occidentalis



Leaves: Alternate, simple, 3-5 lobed, 4"-7" across, generally wider than long, light green above, paler and wooly beneath, petiole hollow at the base, enclosing next year's bud.

Sycamore

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hollow at the base, enclosing next year's bud.

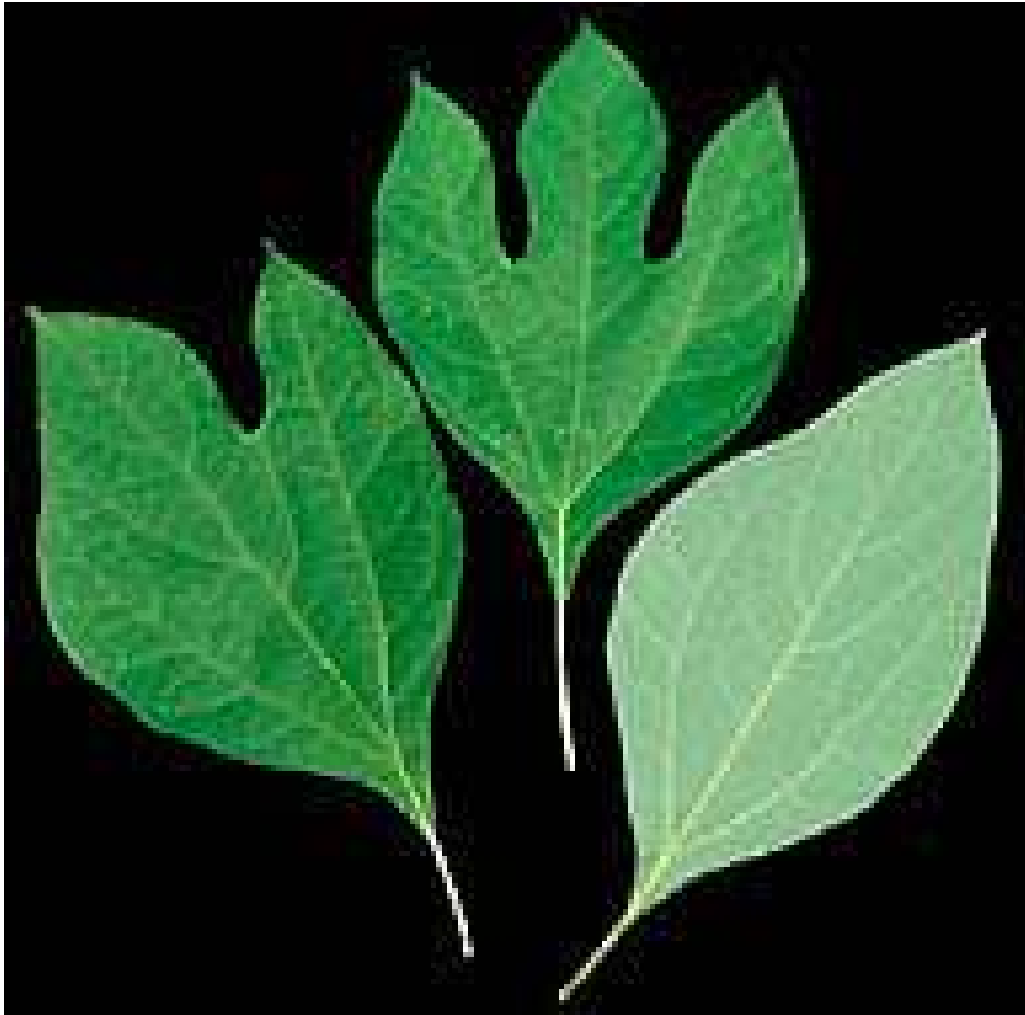
Twigs: At first green and hairy, later brownish, smooth, zigzag; buds cone-like with a single, smooth reddish-brown scale.

Fruit: A round, light-brown ball, 1" in diameter, made up of many seeds surrounded by silky hairs, hanging singly or in pairs by a tough, slender stalk throughout the winter.

Bark: Consists of two layers, the outer peeling in brown flakes, the inner whitish, yellowish or greenish, the base of old trunks dark brown and fissured.

General: Large, massive trees typically found on stream banks and floodplains attaining heights of 70'-125' or more. Also called Buttonwood or American planetree, the wood is used for furniture, butcher blocks and flooring. The London planetree, *P. x acerifolia* Wild., with 2-4 fruits per stalk, is commonly planted as a shade tree in urban areas.



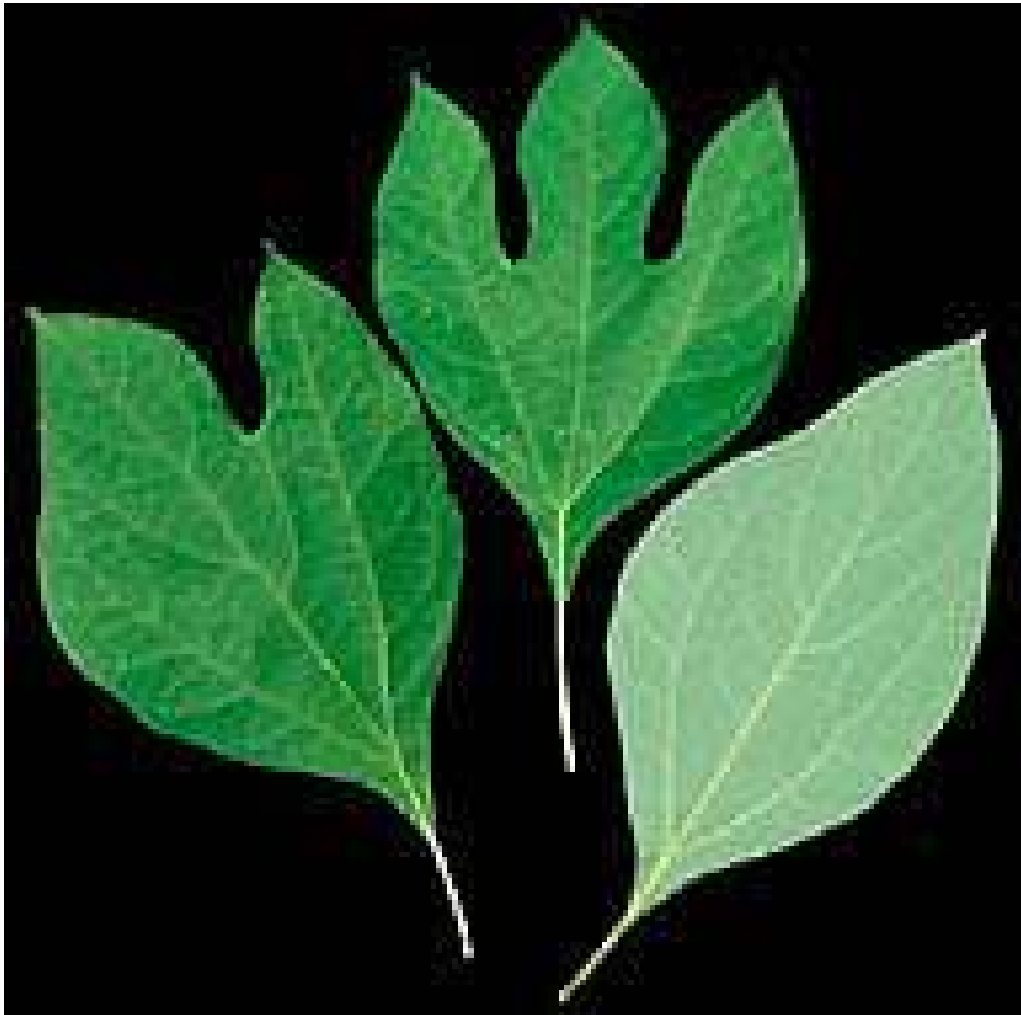


Sassafras:

Key Guide: 1b – 12b – 18a – 19b – 22a – 23b – 24b – 25a

Sassafras

Sassafras albidum



Leaves: Alternate, simple 4"-6" long, smooth, dark green above, much lighter beneath, characteristically aromatic when crushed. Usually three types can be found on a tree: entire, two-lobed and three-lobed (rarely five-lobed).

Sassafras

Leaves: Alternate, simple 4"-6" long, smooth, dark green above, much lighter beneath, characteristically aromatic when crushed.

Usually three types can be found on a tree: entire, two-lobed and three-lobed (rarely five-lobed).

Twigs: Bright green, sometimes reddish, smooth and shiny; large white pith. End bud much larger than side ones, with many loose scales.

Fruit: A berry, dark blue, shiny, about 1/2" in diameter, on a red stem enlarged at the point of attachment; borne in clusters. Yellow flowers appear before the leaves unfold.

Bark: Young trees furrowed, greenish, changing to brown; inner bark salmon colored; older trees show deep fissures extending long distances up the trunk.

General: A small to medium-sized tree, to 50' high, with crooked branches; often spreading by root suckers. Its roots, leaves, twigs and fruit have a spicy odor; the oil contained in these parts is used for a "tea," in medicines, perfumes, etc. Wood used chiefly for fuel and fence posts.





**Hint: leaves usually
greater than 5 inches
long**



Cucumber-tree magnolia:

Key Guide: 1b – 12b – 18a – 19a – 20b – 21b

Cucumber-tree Magnolia

Magnolia acuminata



Cucumber-tree magnolia:
Key Guide: 1b – 12b – 18a – 19a – 20b – 21b

Cucumber-tree Magnolia

Leaves: Alternate, simple, 4"-12" long, smooth above, downy beneath; margins smooth or somewhat wavy.

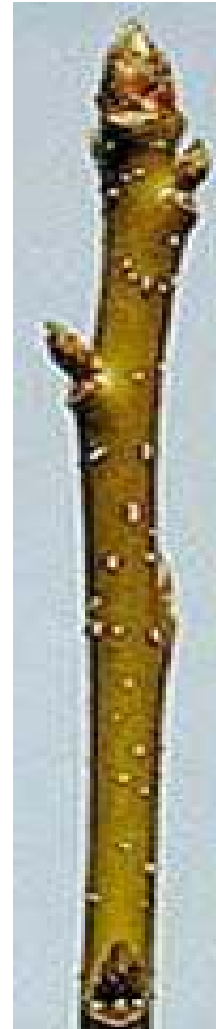
Twigs: Reddish-brown, shiny, with peppery smell and taste. Buds covered with greenish-white silky hairs; end buds $\frac{1}{2}$ " – $\frac{3}{4}$ " long. Leaf scars horseshoe shaped.

Fruit: When young, like a small green cucumber, when mature in autumn, 3"-4" long, a cluster of small red pods, each containing two scarlet seeds; often remains attached all winter. Flowers large (3" long), greenish-yellow, single, upright; appear from April to June.

Bark: Gray-brown to brown, developing long, narrow furrows and loose scaly ridges.

General: A medium-sized tree, native to rich upland woods and slopes in the western half of the commonwealth. Magnolia wood is used mainly for interior finish, furniture, and containers. Songbirds, squirrels, and mice eat the seeds.



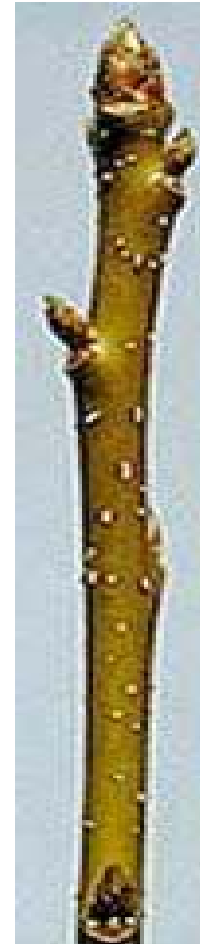


Sweetgum:

Key Guide: 1b – 12b – 18a – 19b – 22a – 23a

Sweetgum

Liquidambar styraciflua



Leaves: Star-shaped or maple-like, 3"-6" long. Has five to seven pointed lobes with finely saw-toothed margins. Has a resinous odor when crushed. Shiny and dark green above, turning a reddish color in the fall.

Sweetgum

Leaves: Star-shaped or maple-like, 3"-6" long. Has five to seven pointed lobes with finely saw-toothed margins. Has a resinous odor when crushed. Shiny and dark green above, turning a reddish color in the fall.



Twigs: Green to brown, and stout.



Fruit: A long-stalked drooping brown ball 1-1 ¼" long, containing many individual fruits. Each with 1-2 long-winged seeds, maturing in autumn and often persisting into winter.

Bark: Gray; deeply furrowed into narrow scaly ridges.

General: Also known as Redgum or Sapgum, a large aromatic tree with a straight trunk and conical crown that becomes round and spreading, 60-100' tall. It is an important timber tree used for cabinetwork, veneer, plywood, pulpwood, barrels, and boxes. Grows well in moist soils of valleys and lower slopes. Often a pioneer after logging and in old fields.





Norway Maple:
Key Guide: 1b – 12a – 13a – 14a – 15b

Norway Maple

Acer platanoides



Leaf: Opposite, simple, and palmately-veined, 5 to 7 lobed with long-pointed "teeth," exudes milky white sap from the petiole when detached, dark green above, paler below.

Norway Maple

Leaf: Opposite, simple, 5 to 7 lobed with long-pointed "teeth," milky white sap exudes from the broken leaf stalk; dark green above, paler below.



Twig: Stout, reddish-brown. Buds glossy red with green at the base, bud scales with keel-like ridges. Leaf scars meet to form a sharp angle, encircling the twig.



Fruit: Widely divergent 2-winged samaras, spreading nearly to the horizon. 1 1/2 to 2 inches long in clusters, relatively flat seed cavity, mature in autumn.

Bark: Smooth and light brown on young trees, dark and fissured but not scaly when older.

General: Imported from northern Europe and extensively planted along city streets and in parks. Typically reaches 50' high. It frequently escapes from cultivation to grow in disturbed woods and roadways. Can be distinguished from other maples by the larger leaves, **milky sap of the petiole**, and the horizontal wings of the fruit.

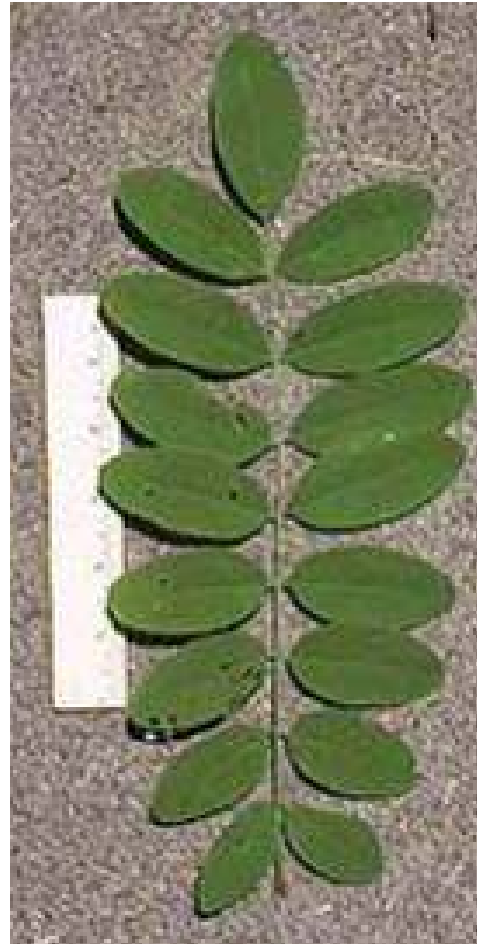
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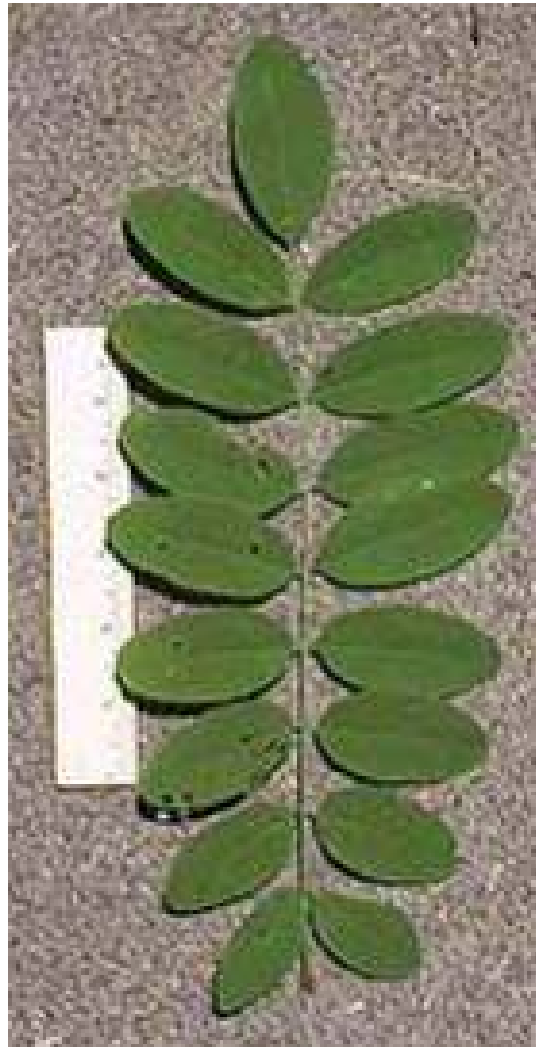
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Hint: sap not milky

Black Locust

Robinia pseudoacacia



Leaves: Alternate, compound, 7-19 oval leaflets 1"-2" long, margins smooth.

Black Locust

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Leaves: Alternate, compound, 7-19 oval leaflets 1"-2" long, margins smooth.

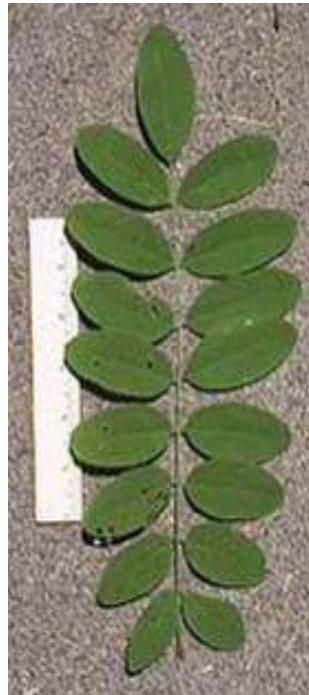
Twigs: Angled, somewhat zigzag, brittle, with short-stout prickles; no end bud, side buds small and hidden in winter.

Fruit: A thin, flat pod, 2"-4" long; usually with 4-8

seeds; splits into halves when ripe. Flowers white, showy, and very fragrant in drooping clusters, appearing in May and June.

Bark: Reddish-brown, rough, furrowed, and thick.

General: A medium-sized tree to 45' high, found in open woods, floodplains, thickets and fencerows throughout the state. Wood is durable when in contact with soil and in demand for posts, poles, railroad ties, and mine timbers. Unfortunately, several insects and wood rots cause heavy damage, especially to trees on poor soils. Squirrels eat the seeds, and bees make honey from the nectar of locust flowers.





Striped Maple:

Key Guide: 1b – 12a – 13a – 14a – 15b

Striped Maple

Acer pensylvanicum



Leaves: Opposite, simple, three-lobed, rounded at the base, with finely-toothed margins and rusty pubescence on the lower surface.

Striped Maple

Striped Maple:

Leaves: Opposite, simple, three-lobed, rounded at the base, with finely-toothed margins and rusty pubescence on the lower surface.



Twigs: Smooth and stout, at first greenish, later red. The pith is brown with each season's growth marked by two or three dark lines encircling the twig.



Fruit: Wings very divergent, about $\frac{3}{4}$ " long, maturing in September in drooping clusters. Marked on one side of the seed with a depression.

Bark: Smooth and greenish or reddish-brown, conspicuously marked with longitudinal white streaks. Older trunks are rougher, darker and less streaked.

General: Usually from 10'-25' high; common in the mountainous parts of the state on moist, cool, shaded slopes and in deep ravines.

Striped Maple:

Leaves: Opposite, simple, three-lobed, rounded at the base, with finely-toothed margins and rusty pubescence on the lower surface.

Twigs: Smooth and stout, at first greenish, later red. The pith is brown with each season's growth marked by two or three dark lines encircling the twig.

Fruit: Wings very divergent, about 3/4" long, maturing in September in drooping clusters. Marked on one side of the seed with a depression.

Bark: Smooth and greenish or reddish-brown, conspicuously marked with longitudinal white streaks. Older trunks are rougher, darker and less streaked.

General: Usually from 10'-25' high; common in the mountainous parts of the state on moist, cool, shaded slopes and in deep ravines.



Hint: milky sap

Smooth Sumac

Rhus glabra



Leaf: Alternate, pinnately compound, 11 to 31 leaflets per leaf, leaves are 12 to 18 inches long. Leaflets are lance-shaped, serrate and are 2 to 4 inches long. Leaflets are finely hairy below. Whitish beneath, turning maroon in the autumn.

Smooth Sumac

Leaf: Alternate, pinnately compound, 11 to 31 leaflets per leaf, leaves are 12 to 18 inches long. Leaflets are lance-shaped, serrate and are 2 to 4 inches long. Leaflets are finely hairy below. Whitish beneath, turning maroon in the autumn.



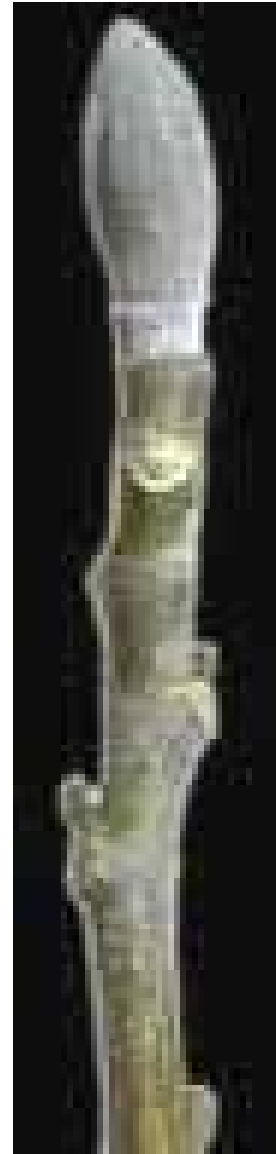
Twig: Stout, lacking hairs and often with a whitish bloom. Buds are small, rounded and covered with light brown hairs.

Bark: Brown-gray and smooth, becoming scaly with age.

Flower: White petals, borne on upright clusters up to 8 inches long. Flowering June to August. Male and female parts usually found on separate plants.

Fruit: A drupe borne in clusters. Fruits are dark red, round and hairy, 1/8 inch long. Maturing September to October but often persisting through winter.

General: A shrub or small tree with a short or multi-stemmed trunk and spreading branches. Only shrub or woody species native to all lower 48 states. It is eaten by many types of wildlife, including birds, small mammals, and deer. Indians would eat the young sprouts as salad, and the fruit could be chewed to quench thirst.



Tulip (Yellow) poplar:

Key Guide: 1b – 12b – 18a – 19b – 22a – 23b – 24a

Yellow-poplar

Liriodendron tulipifera



Leaves: Alternate, simple, 4"-6" in diameter, generally four-lobed, bright green, turning yellow in autumn.

Yellow-poplar

Tulip (Yellow)

Poplar:

Leaves: Alternate, simple, 4"-6" in diameter, generally four-lobed, bright green, turning yellow in autumn.



Twigs: In spring and summer, green, sometimes with purplish tinge; during winter, reddish-brown, smooth and shiny. Buds large, smooth, flattened.



Fruit: At first green, turning light brown when ripe in autumn; cone-like, 2 ½" – 3" long. Made up of winged seeds. Greenish yellow tulip-like flowers in May or June.

Bark: Young trees dark green and smooth with whitish vertical streaks. Older trunks are dark gray and furrowed.

General: Also known as Tulip poplar, White poplar and Whitewood. A large tree, the tallest of the eastern hardwoods. It grows rapidly and is an important timber and shade tree. The wood is valuable for veneer and many other uses. Songbirds and game birds, rabbits, squirrels, and mice feed on the seeds. Whitetail deer browse the young growth.



The Summer Key To Pennsylvania Trees is a small part of the Pennsylvania 4-H forestry curriculum. Contact your Penn State Cooperative Extension Office to request additional information about 4-H and other educational programs.

The Summer Key to PA Trees is now available on-line as a downloadable pdf file. It is available through this url: <http://pa4h.cas.psu.edu/online.html>

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- Review: James Finley & Sanford Smith, The Pennsylvania State University School of Forest Resources & Cooperative Extension
- Images provided courtesy of Virginia Tech & The University of Wisconsin.
- Line art courtesy of The Pennsylvania State University College of Agricultural Sciences and the Pennsylvania 4-H Program

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