Trees come in various shapes and sizes but all have the same basic structure. They have a central column called the trunk. The bark-covered trunk supports a framework of branches and twigs. This framework is called the crown. Branches in turn bear an outside covering layer of leaves.

A tree is anchored in the ground using a network of roots, which spread and grow thicker in proportion to the growth of the tree above the ground. In a mature tree, most of the cells of the trunk, roots, and branches are dead or inactive. All growth of new tissue takes place at only a few points on the tree, by the division of specialized cells. These actively growing areas are located at the tips of branches and roots and in a thin layer just inside the bark. Lastly, trees have reproductive structures; either flowers or cones.

Simple enough, but I say all this to help you find the essential markers to identify a tree. Leaves, bark, twigs and fruit can make quick work of tree identification. Shape, although not a tree "part", plays a key role in tree species characteristics.

Leaves are food factories of the tree. Powered by sunlight, the green substance in leaves, called chlorophyll, uses carbon dioxide and water to produce life-sustaining carbohydrates. The entire process is called photosynthesis. Leaves are also responsible for respiration and transpiration.

A tree's leaf is one major marker that helps in keying out and identifying any species of tree. Most trees can be identified by the leaf alone.

As you can see in the illustration, leaves come in many shapes and sizes. The "star" shape of sweetgum is totally different from the heart-shaped leaf of an eastern redbud. Note that leaves can be described by observing their base, their margin and their tip or apex. Each characteristic has a name and is used a part of the identification process.

A leaf can either be simple (no extra leaflets) or compound (three or more leaflets). This leaf structure is always a help with tree identification because of each tree species' leaf structure.

On a simple leaf, the leaf blade is singly attached to a twig or twig stem. On a compound leaf, all leaflets are attached to a single leafstem or rachis.

Compound leaves can be confusing because of the many variations of leaf structure. The major differences are palmate leaves, leaflets or lobes that grow from a leafstem in the manner of a hand. Pinnate leaves grow leaflets on opposite sides of a leafstem.

There are also leaves that have double compound or twice-compound leaflets.

Besides its branches, roots, and leaves, a mature tree grows another important structure - the flower (or cone, in the case of evergreens). These are the reproductive structures from which the seeds are produced.

These seed pods, cones, flowers and fruit are major markers that help in keying out and identifying a specific species of tree. Not as dependable as a leaf, a fruit or seed pod might only be found at certain times of the year. Leaves generally hang around either on the tree or on the ground beneath the tree.

Believe it or not, twigs can be used to identify a tree. Good thing because they are about all you have during the dormant months of winter. Twigs and buds are generally not used to ID a tree during late spring through early summer.

Twigs have structures called buds, leaf scars and bundle scars that can be different on different species. Thorns and spines can occur on twigs and are unique to certain trees. The twig pith can have unique "chambers" and/or have a specific shape. Twigs are a great marker if you know what to look for.

Other twig structures used in tree identification are stipule scars, bud scale and fruit scars, spur shoots and lenticels. Find a good twig key for best results. Virginia Tech's Dendrology Department provides a great tree key on the Internet.

Reproductive structures are great sources for tree identification. The acorn of an oak is a seed but completely different from a maple's samara. Study the illustration to familiarize yourself with many of the possible seeds and fruiting structures on trees.

Bark is a tree's natural armor and protects from external threats. Bark also has several physical functions, one is ridding the tree of wastes by absorbing and locking them into its dead cells and resins. Also, the bark's phloem transports large quantities of nutrients throughout the tree.

Xylem carries water and minerals from the roots to the leaves. Phloem carries manufactured food (sugars) from the leaves to the roots. The cambium (a watery layer only a few cells thick) is the generative layer, giving rise to both xylem and phloem.

According to Hugues Vaucher, author of Tree Bark - A Color Guide, "It would take a million pictures to cover the full variety of textures found in tree barks." Lucky for us that bark textures are relatively uniform by tree species and make a great visual marker for broad tree identification. Bark textures are divided into at least 18 types, from smooth (beech) to spiny (locust).

I've not found a key for bark and think one would be very hard to create. Only the broadest classifications can be determined using bark alone. You can very readily distinguish between an oak and a beech looking at bark. The hard part is separating the various oak or beech species by bark alone.

Ok, so the shape is not really a part. Still, it is a distinguishing feature of a tree and another way to help in its identification.

Naturalist Roger Tory Peterson says that unlike the precise silhouette of birds, a tree is not so consistent in form or shape. "The beginner, learning his trees, yearns for a book that will give him shapes and field marks by which he can make snap identification. But it isn't that easy...within limits one can with practice, recognize by shape and manner of growth quite a few trees".

A yellow-poplar will always look like a yellow-poplar in a very general sense. However, a young tree may look entirely different from the parent tree. A forest grown tree may grow tall and slender while his field-grown cousin develops a maximum crown in the open sun.