

7. *Trees and Shrubs*

Trees and shrubs are vascular, woody plants that use photosynthesis to create energy. Vascular means they have veins. Photosynthesis is the process by which plants make more tissue (“food”) in the leaves using sunlight, water and nutrients brought up to the leaves from the roots via those veins.

Trees usually have a single trunk with defined crowns that grow over 16 feet.

Shrubs are usually multi-trunked and grow under 20 feet.

Trees (and other plants) come in two types, *Angiosperms* and *Gymnosperms*.

Angiosperms are flowering plants (including trees) whose seeds are enclosed in an ovary that ripens into a fruit. Angiosperms are commonly referred to as “hardwoods” or “broad leafs”. The leaves of angiosperms are designed with a coating on the top to slow *transpiration* (water loss from leaves) and are unprotected on the bottom to help facilitate the giving off of oxygen through tiny *stoma*, meaning “mouths”.

Angiosperms are divided into two subclasses, *Monocots* and *Dicots*.

Monocots, or monocotyledons, have a simple seed. Palms (think of dates, coconuts or cabbage palm berries), lilies, orchids and grasses are monocots.

Dicots, or dicotyledons, have a divided seed, producing two seed leaves. (Think of beans.) Most deciduous trees (those that seasonally drop leaves) and shrubs are dicots. A major exception is cypress, which drops its leaves, but is a conifer, therefore not even an angiosperm, but a gymnosperm.

Gymnosperms, meaning “naked seeds,” produce exposed seeds, usually on cones. Conifers, “needle leafs,” ginkgo and cycads are gymnosperms. These trees are usually “evergreen” and “softwoods”. The conifers are the most numerous and widespread gymnosperms on earth. The conifer leaf is long and slender (needle-like, as pines and bald cypress) or small and overlapping (scale-like, as pond cypress). Conifers have thick coatings on the leaves to protect against severe conditions like drought and freezing.

A unique feature of conifers are the reproductive cones. These cones have a central axis with spiraling scales bearing pollen or seeds. Most trees have both pollen-bearing (male) and seed-bearing (female) cones.