

Stem Anatomy and Function

Letter		
A	Xylem	This vascular bundle, always located closer to the center of the stem. In woody stems, as the secondary tissue thickens, it forms a tissue known as wood. Each year, a new layer of this tissue is added to the thickening core; a layer known as an annual ring.
B	Phloem	This vascular bundle, always located closer to the outer portion of the stem. This tissue transports sugars made in the leaves throughout the plant
C	Endodermis	This tissue forms the innermost layer of the cortex. This is a single layer of tightly-packed rectangular cells bordering the stele of the stem. The cells of this tissue store starch and allows solutions to pass from the vascular bundles to the cortex
D	Pericycle	A thin layer of meristematic cells that surrounds the vascular bundle. This layer strengthens the stem and provides protection for the vascular bundles.
E	Cortex	The parenchyma tissue, usually with slightly thicker cell walls, that surrounds the vascular tissue. Its main function consists of the storage of photosynthetic products.
F	Pith	The parenchyma tissue located at the very centre of the roots and stems. Its main function consists of the storage of nutrients, carbohydrates and water.
G	Heartwood	The oldest of the xylem secondary layers that form the core of the woody plant stem. These layers are dead, and do not conduct water or minerals
H	Vascular Cambium	This is the meristematic cells layer in the found in the vascular bundle located between the two types of vascular tissue. Cells of this layer divide by mitosis to produce secondary phloem to the outside and secondary xylem to the inside
I	Cork Cambium	The meristematic layer in the bark of a woody plant that produces cork; the outer layer of the tree that prevents water loss from the tree.
J	Cork	A component of bark that covers the outer layer of the tree that protects it and prevents water loss from the stem

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Some species of plants have herbaceous stems and some have woody stems. Herbaceous plants have stems that do not contain wood. Their stems are pliable, carry out photosynthesis and have a thin epidermis. As the name suggests, woody plants have stems that contain wood. Woody stems are relatively hard, have bark, and do not usually carry out photosynthesis. Here is a look at the difference in their anatomy:

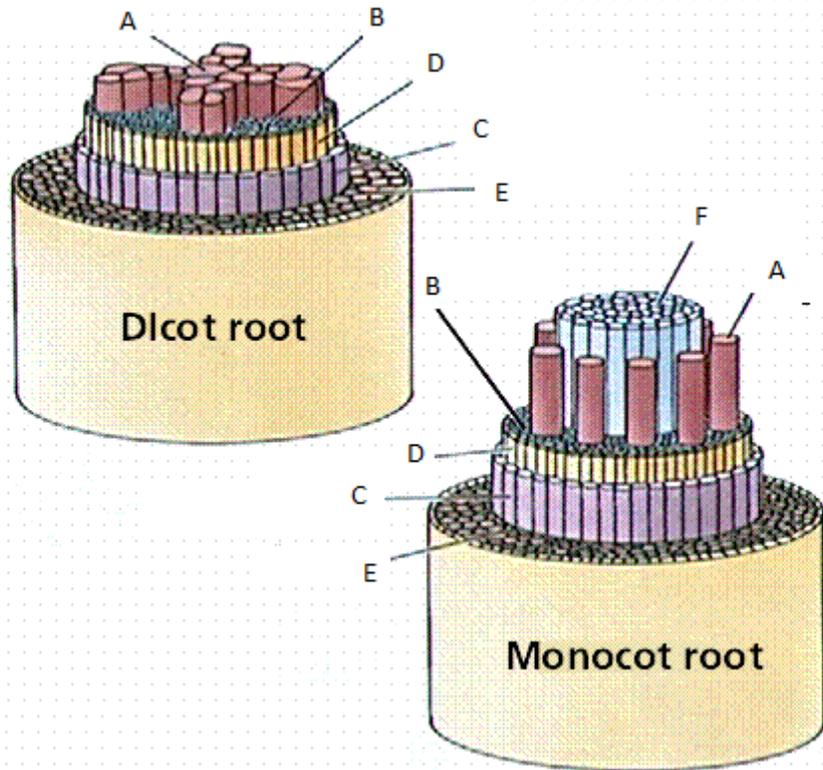


Figure 1: Herbaceous plant stems

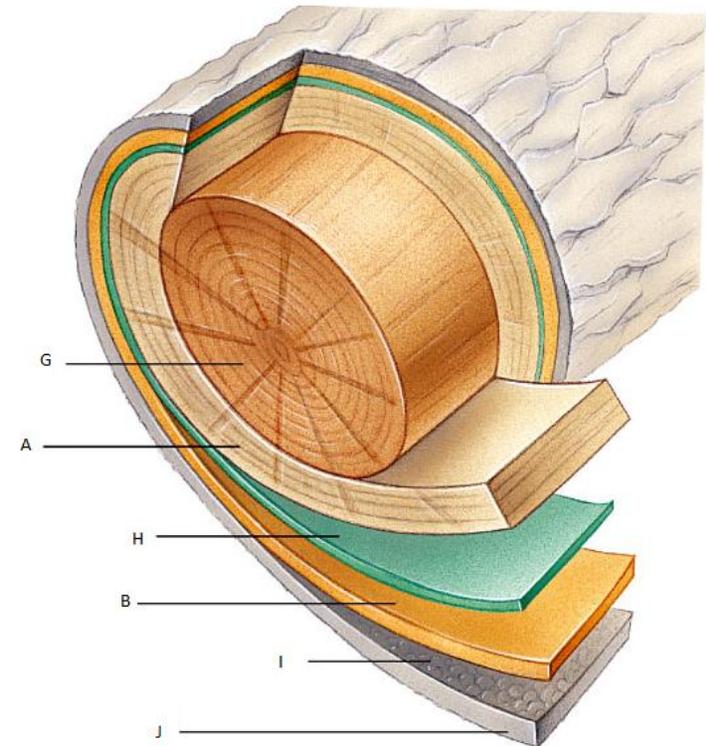


Figure 2: Woody plant stems