



# Colorado MASTER GARDENER

## Plant Structures: Cells, Tissues, and Structures

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by D. Whiting, M. Roll, and L. Vickerman<sup>1</sup>  
Line drawings by S. Johnson.

### Outline . . .

#### Cells, Tissues, and Structures

In reviewing plant physiology, plant cells are grouped into tissues based on similar characteristics, then into five distinct structures (organs).

**Cells** – individual building blocks for life processes and growth. Common cells contain genetic matter (DNA) and metabolic organelles but they are mostly water. In green plants, they are the site of sugar production (photosynthesis).

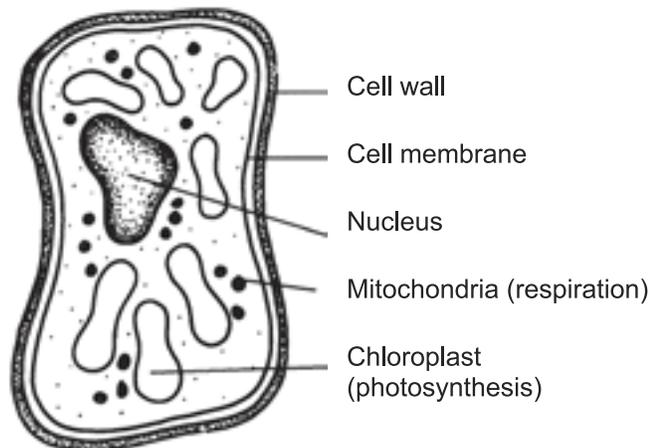


Figure 1. Diagram of a plant cell.

**Tissues** – groups of cells that are similar in appearance and function, for example:

- **Epidermis** is the single exterior layer that protects the stems, leaves, flowers, and roots. The outside surface of the epidermis tissues is usually covered with a waxy substance called cutin, which reduces water loss.
- **Parenchyma** tissues are simple, thin-walled cells. In a carrot, for example, the parenchyma cells become a storage unit called the cortex. In leaves, a layer of parenchyma tissues under the epidermis is active in photosynthesis. When wounded, parenchyma cells can become meristematic and proliferate to grow over the wound.
- **Meristematic** tissues are comprised of actively dividing cells.
- **Sclerenchyma** tissues are thick-walled support cells found throughout the plant as fiber.
- **Xylem** is a structurally complex tissue that conducts water and nutrients from the roots to all parts of the plant. The xylem is comprised of a series of long tubes made up of shorter vessel members. In woody plants, the xylem tissue becomes the wood.

- **Phloem** tissue conducts food and metabolites from photosynthesis throughout the plant including down to the roots.

**Structures** (organs) – groups of tissues working together with a common function (roots, stems, leaves, flowers, fruits, and seeds).

**Plant** – made up of a number of coordinated structures to form a working unit.

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*<sup>1</sup>D. Whiting, Colorado State University Cooperative Extension consumer horticulture specialist and Colorado Master Gardener coordinator; M. Roll, Extension horticulture agent, Arapahoe County; and L. Vickerman, Extension horticulture agent, El Paso County.*

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