

# Plant Cells, Tissues & Organs

Plants and animals are the only two kingdoms that contain organisms at the *organ level of complexity*. Most members of both kingdoms contain different kinds of **cells** that have become *specialized* for specific jobs, true **tissues** consisting of groups of cells specialized for certain functions and true **organs** consisting of various tissues that have been designed for various functions.

## Plant Cells:

- Meristem:** embryonic (stem) cells that can differentiate into any other cell or tissue type. Meristem cells are mainly located in the apical and axillary buds in all plants and in the cambium of perennial (woody) plants.
- Parenchyma:** the most common kind of cell found in plants. These are cells with very thin walls found in soft parts of plants. They perform most of the metabolic functions of the plant, ie. photosynthesis, gas exchange, food storage and transport of nutrients and hormones.
- Collenchyma:** Uncommon cells with unevenly thicker cell walls that tend to be grouped into strands and cylinders especially near the stem surface and along leaf veins. They mainly help to support herbaceous (annual or biennial) plants or new plant growth.
- Sclerenchyma:** Cells with extremely thick cell walls of cellulose and often lignin that are dead at maturity. They are found especially in parts of the plant that have stopped growing and make up the bulk of the wood of perennial plants and the protective covering of seeds where they provide structural support and conduction of water and minerals from the roots to the leaves.

## Plant Tissues:

Plant organs are composed of three kinds of tissues:

- Dermal Tissue:** forms the outer covering of plants; two kinds; epidermis of herbaceous plants and periderm of woody plants
- Vascular Tissue:** the plumbing of most plants – moves water, minerals, nutrients and hormone throughout the plant; two kinds; xylem and phloem
- Ground Tissue:** makes up the bulk of herbaceous plants and does most of the plant's 'work' such as photosynthesis, gas exchange and food storage

## Plant Organs:

Plants produce two kinds of organs; vegetative and reproductive.

**Vegetative organs:** (eg. roots, stems, leaves) generally exist for the life of the plant.

**Reproductive organs:** (eg. sori, capsules, antheridia, archegonia, male & female cones, flowers & fruits) are temporary structures that facilitate asexual or sexual reproduction

Variations in Reproductive Organs within the four main plant groups		
Plant Group	Asexual Reproductive Organs	Sexual Reproductive Organs
<b>Mosses</b>	capsule ‡ spores	antheridium ‡ sperm archegonium ‡ egg
<b>Ferns</b>	sori ‡ spores	antheridium ‡ sperm archegonium ‡ egg
<b>Conifers</b>	none	male cone ‡ pollen } female cone ‡ ovule } seed
<b>Flowering Plants</b>	none	flower { stamen ‡ pollen } { pistil ‡ ovule } seed in fruit