

CASE

*Curriculum for Agricultural
Science Education*

Principles of Agricultural Science – Plant

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Stem Facts

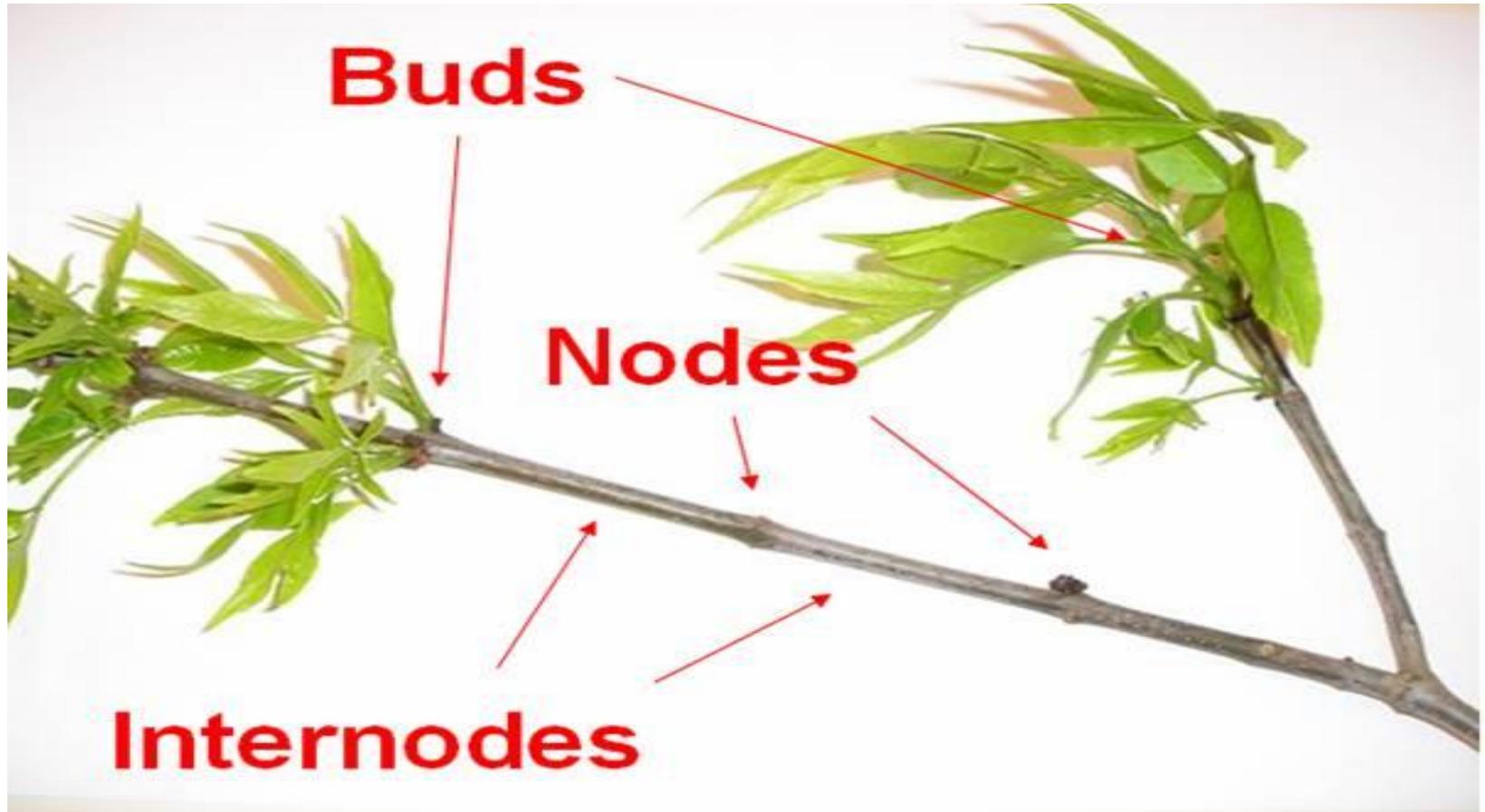
Unit 4 – Anatomy and Physiology
Lesson 4.3 Stems, Stalks, and Trunks

Function of Stems



- Provide physical support
- Aid in translocation of nutrients
- Store food reserves
- Site of photosynthesis

External Parts



Internal Parts



- Annual rings (woody plants)
- Phloem (cambium – woody plants)
- Pith or Secondary Xylem (woody plants)
- Xylem

Phloem and xylem comprise the vascular system

Function of Xylem and Phloem



Xylem

- Translocate water and dissolved nutrients upward from the roots throughout the plant.

Phloem

- Carry synthesized food (sugars) downward from leaves and other photosynthetic regions throughout the plant growing regions.

Internal Parts Labeled



Annual Ring

Bark

Pith

Phloem/Cambium

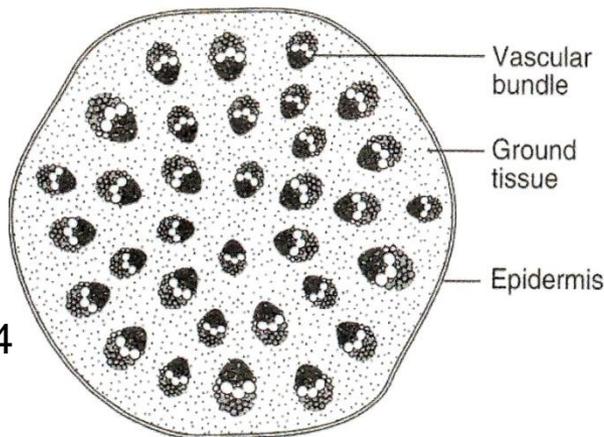
Xylem

Internal Parts Labeled



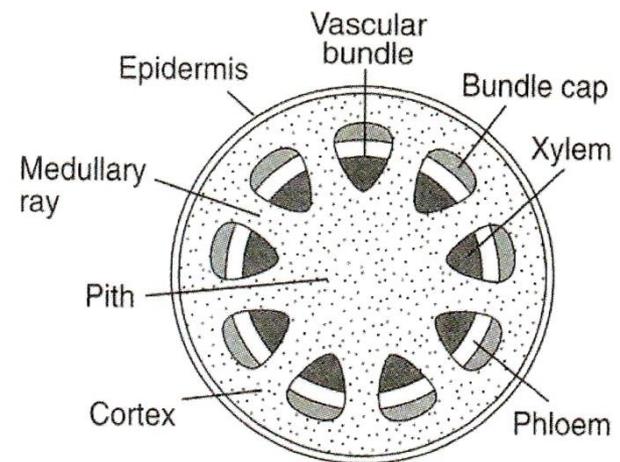
Monocotyledon versus Dicotyledon

The arrangement of the vascular system provides evidence to distinguish between monocotyledon and dicotyledon plants



Parker, 2004

Monocotyledon



Dicotyledon

Strength of Stems



Herbaceous

- Herbaceous stems rely on water pressure, known as turgor.

Modified

Woody

- Rigid, or woody, stems derive their strength from extra thick cell walls.
- The specific material which comprises the rigid cell walls is called hemicellulose and lignin.

Herbaceous Stems

Physical support is a result of turgor or internal water pressure.

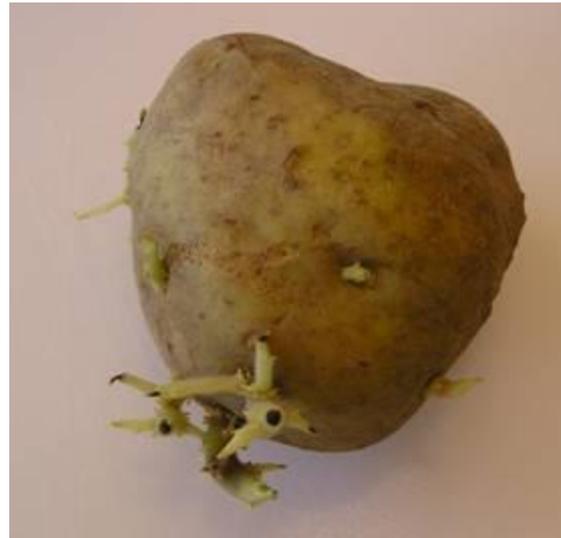


Modified Stems

Types of modified stems:

- Bulbs
- Corms
- Rhizomes
- Runners
- Tubers

Tuber



Runner

Woody Stems

Physical support is a result of rigid cell walls.



References



Parker, R. (2004). *Introduction to plant science* (Rev. ed.). Clifton Park, NY: Delmar.

Parker, R. (2010). *Plant and soil science: Fundamentals and applications*. Clifton Park, NY: Delmar.

Schooley, J. (1997). *Introduction to botany*. Albany, NY: Delmar Publishers.