

I. Water movement in general

A. simple diffusion

concentration gradient

B. osmosis

semi-permeable membrane

II. Water movement between plant cells and the environment

A. hypotonic solution

cell is turgid

B. hypertonic

cell is plasmolyzed

C. isotonic

cell is flaccid

D. imbibition of seeds

III. Movement of small substances in or out of a cell

A. Passive transport

1. Simple diffusion

2. Facilitated diffusion

B. Active Transport

IV. Water movement in an entire plant

A. overall pattern

B. root pressure theory

C. capillarity theory

1. adhesion of water

2. cohesion of water

D. cohesion-tension theory

E. Guttation

V. Photosynthate (sugars) flow in a plant

Pressure-Flow/Bulk Flow/Mass Flow hypothesis
source cells

phloem-loading

sink

VI. Mineral nutrition

A. essential elements

B. macronutrients

C. micronutrients

D. deficiencies

E. how are they brought in

remember: cation exchange