What is Plant Physiology?

Worksheet

Plant physiology is the branch of biology studying the internal functions of plants, including photosynthesis, respiration, water transport (transpiration), and hormone-regulated growth and development.

Questions

1. Which organelle carries out photosynthesis?

A) Mitochondria
B) Chloroplast
C) Nucleus
D) Ribosome

2. What tissue transports water and minerals upward in a plant?

A) Phloem
B) Xylem
C) Epidermis
D) Cortex

3. Which process causes water loss through leaf stomata?

A) Respiration
B) Translocation
C) Transpiration
D) Photolysis

4. Which hormone is primarily responsible for fruit ripening?

A) Auxin
B) Ethylene
C) Cytokinin
D) Gibberellin

5. A houseplant left in a dark room for two weeks turns pale and stops growing. Explain why.

6. On a hot, dry day, a plant's leaves wilt even though the soil still has some water. Why?

7. A gardener applies a rooting hormone to a plant cutting to encourage new roots. What hormone is likely used and how does it work?

8. Define: What is plant physiology?

9. Define: What produces glucose in plants?

10. Define: What drives water movement up a plant?

Answer Key

1. B) Chloroplast - Chloroplasts contain chlorophyll and the machinery for photosynthesis.

2. B) Xylem - Xylem carries water and dissolved minerals from roots to leaves.

3. C) Transpiration - Transpiration is the evaporation of water from leaf surfaces, mainly through stomata.

4. B) Ethylene - Ethylene gas triggers the ripening process in many fruits.

5. Without light, chloroplasts cannot carry out photosynthesis Glucose production stops, so the plant lacks energy (ATP) and building blocks for growth Chlorophyll production also decreases without light, causing paleness (chlorosis) Growth halts because there's no sugar for respiration or new cell production

6. High temperature increases the rate of transpiration through stomata Water loss from leaves exceeds the rate roots can absorb and transport water Cells lose turgor pressure (become flaccid) without enough water The plant wilts to reduce further water loss until conditions improve

7. Auxin is the plant hormone that stimulates root initiation and cell elongation Applying auxin to the cut end increases local auxin concentration This triggers cell division and differentiation into new root cells Within days, adventitious roots begin to form at the cut site

8. The study of how plants function internally - photosynthesis, respiration, water transport, and hormone-driven growth.

9. Photosynthesis, occurring in chloroplasts, using light, CO2, and water.

10. Transpiration pull - water evaporating from leaf stomata creates tension that draws water up through the xylem.