

PLACE YOUR CURSOR OVER THE YELLOW NOTE BUBBLES FOR COMMENTS:



1 **Plant Parts, Structures, and Functions**

Horticulture

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2 **Lesson Objective:**

The student will be able to identify plant parts, structures, and functions.



3 **Key Terms:**

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- Cell Wall
- Plasma Membrane
- Cytoplasm
- Nucleus
- Mitochondria
- Plastids
- Vacuoles
- Roots
- Stems
- Leaves
- Flowers
- Scales

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- Bracts
- Tendrils
- Thorns
- Sacs
- Sepals
- Petals
- Stamens
- Pistil
- Perfect Flower
- Imperfect Flower
- Monocot
- Dicot


4 **Logistical Information:**

- Text Reference: Greenhouse Operation and Management, IML.
- Plant Cell Parts: http://www.cellsalive.com/cells/cell_model.htm
- Plant Parts: <http://www.urbanext.uiuc.edu/gpe/case1/c1facts2a.html>
- Plant Functions: <http://qldscienceteachers.tripod.com/junior/biology/plants.html>

5 **Interest Approach:**

To Successfully produce plants, it is important to know the functions of the plant parts and structures. Upon completing this lesson, the student will be able to name the major parts of the plants and know the major functions of each part.




6  1. What are the parts of a plant cell?




- Cell wall
- Plasma membrane
- Cytoplasm
- Nucleus
- Mitochondria
- Plastids
- Vacuoles

7  2. What are the functions of the basic parts of a plant?


- Roots
 - Anchor the plant
 - Absorb water and minerals
 - Translocate water and minerals to the stem
 - Store food
- Stems
 - Translocate water, minerals, and food to the leaves
 - Support the leaves and display them to light
 - Store food
- Leaves
 - Manufacture food through photosynthesis
 - Provide site of gas exchange with the atmosphere
 - Store food
- Flowers
 - Contain organs specialized for sexual reproduction
 - Produce seeds and fruit

8  3. What are the functions of the specialized plant tissues?

- Meristem tissues – cells that are actively dividing to form new growth
 - Apical meristem tissues – increase plant length at tip
 - Cambium meristem tissues – increase plant size in diameter
 - Intercalary zone meristem tissues – increase stem height
- Permanent tissues – mature cells that are not actively dividing
 - Epidermis tissue – protect and support inner cells of plant
 - Vascular system tissues – Xylem (up) and Phloem (down)


9  4. What are the functions of the different types of roots?

- Tap root – primary root, anchoring, greater depth, and storage area for food
- Fibrous roots – fine roots, shallow roots, more effective absorption of water, minerals, help prevent erosion
- Aerial roots – clinging, short roots that grow out horizontally for stem, and absorptive
- Aquatic roots – absorb oxygen and nutrients from water
- Adventitious roots – develop in places other than nodes, can form on cuttings and rhizomes

10  5. What are hair roots and their functions?

- Tiny one-celled hair-like extensions of epidermal cells located near the tip of the roots where vascular tissues have formed
- Functions
 - Increase the surface area of roots for greater absorption

- Absorb water and dissolved minerals from the soil
- 11 6. What are the primary functions of stems?
- Support branches
 - Support leaves
 - Support flowers
 - Support seeds
 - Support fruit
 - Give the plant height and expose it to sunlight
 - Provide a site for photosynthesis, in special cases
 - Store food
 - Contain tissues that translocate water, dissolved minerals, and food manufactured during photosynthesis
- 12 7. What are the types of specialized stems?
- Corm – gladiolus, crocus
 - Bulb – tulips, lilies, onions
 - Tuber – potatoes, caladium
 - Crown – African violets, fern
 - Spurs – pear and apple trees
 - Rhizomes – lily of the valley, iris
 - Stolon – strawberry, airplane plant
- 13 8. What are the functions of the principal tissues of the leaf?
- Epidermis
 - Cuticle
 - Stomata
 - Guard cells
 - Mesophyll layer
 - Palisade mesophyll
 - Spongy mesophyll
 - Veins or vascular bundles
 - Phloem
 - Xylem
- 14 9. What are the functions the different types of modified leaves?
- Scales – hard, plate-like structures of woody plants,
 - Bracts – colored leaves near the flowers or fleshy leaves
 - Tendrils – slender threadlike modified leaves that twine, for support and anchor
 - Thorns – Short, hard, modified leaves with a sharp point, protects the plant
 - Sacs – Pouch-like modified leaf, hold water and catch insects
- 15 10. What are the functions of the parts of a flower?
- Sepals – vegetative part
 - Petals – vegetative part
 - Stamens – male reproductive part
 - Pistil – female reproductive parts

- 16 11. How are complete and incomplete flowers different?
- Complete flower have all four main parts of a flower
 - Sepals
 - Petals
 - Stamens
 - Pistils
 - Incomplete flowers are missing one or more of the main parts of a flower
 - Apetalous – has no petals
 - Staminate – male flower only (female parts missing)
 - Pistillate – female flower only (male parts missing)
 - Absence of sepals
- 17 12. What are perfect and imperfect flowers?
- Perfect flowers – lilies
 - Flowers contain both male and female parts
 - Flowers are often self-pollinating
 - Imperfect flower – cucumber
 - Flowers containing male or female parts
 - Flowers often cross pollinate
- 18 13. What are the functions of the parts of a seed?
- Seed coats
 - Hard exterior surface of the seed
 - Prevents the seed from drying out, protects embryo for mechanical injury
 - Embryo – miniature plant contained within the seed coat.
 - Epicotyl
 - Hypocotyl
 - Radicle
 - Cotyledons
 - Endosperm
 - Food storage tissues which nourish the developing embryo upon germination; present in monocot seeds only
- 19 14. What are the general differences between monocots and dicots?
- Monocots
 - One cotyledon
 - Leaves with parallel veins
 - Vascular bundles scattered at random within the stems
 - Flowers that have parts in threes or multiples of three
 - Dicots
 - Two cotyledons
 - Leaves with a branched network of veins
 - Stems with vascular bundles in a ring pattern
 - Flower parts in fours or fives or multiples of four or five
- 20 Summary:
- In order to comprehend growth, reproduction, and all the other processes occurring within the plant, it is important to comprehend the basic ideas of 

plant cell structure, plant anatomy, and plant physiology.

21 ☐ **Activities & Strategies:**



- Students will dissect and correctly point out parts of complete and incomplete flowers.
- Students will draw and correctly label parts of a monocot and dicot after soaking seeds in water. (e-moment: Hieroglyphic)
- Students will correctly draw and label a diagram of a plant cell. (e-moment: Crayon)

22 ☐ **Review:**

Briefly discuss with the students why this information is important for all to know. How plant life affects our everyday life and how developing plant life well can enhance our life and the future of agriculture.



23 ☐ **Evaluation:**

Will be passed out following any questions you might have about this lesson.

ACTIONS :

