Plant Anatomy and Physiology

Horticulture
Plant Anatomy

- Organs
- Flower
- Leaf
- Stem
- Root

Tissue Systems
- Dermal
- Vascular
- Ground or Fundamental
Plant Anatomy

- **Organs**
  - Flower
    - Complete / Incomplete
    - Perfect / Imperfect
    - Sterile
  - Leaf
    - Simple
    - Compound
  - Stem
  - Root
    - Primary
    - Secondary
    - Root Hairs

- **Tissues**
  - Dermal
    - Epidermis
    - Periderm/Bark
  - Vascular
    - Xylem
    - Phloem
  - Ground
    - Cortex
    - Pith
    - Mesophyll
**Plant Organs - Flower**

- **Flower Types**
  - Complete – all flower parts
  - Incomplete – lacks one or more of the flower parts
  - Perfect – contains both pistil or stamen
  - Imperfect – lacks either pistil or stamen
  - Sterile – both stamen and pistil are absent
Plant Organs - Leaf

Functions

- Photosynthesis
- Regulate water loss
- Storage
- Support
- Protection
- Attraction
- Propagation

Types

- Simple
  - Blade of the leaf occurs as one unit
- Compound
  - Blade of the leaf is divided into individual leaflets
Plant Organs - Leaf

**SIMPLE**
- Elm
- Maple
- Magnolia

**COMPOUND**
- Pecan
- Locust
- Ash
Plant Organs - Stem

- Functions
  - Support
  - Conduction
  - Food Storage
  - Protection
  - Propagation
  - Photosynthesis
Plant Organs - Roots

- 3 Parts Roots
  - Primary Root
  - Secondary Root
  - Root Hairs

- Type of Root System
  - Tap Root System
  - Fibrous Root System

- Functions
  - Anchorage
  - Absorption
  - Storage
  - Propagation
Plant Tissues

- **Dermal**
  - **Function**
    - Protection from environment and water loss
  - **Consists of**
    - Epidermis – single layer of cells on primary plant parts (herbaceous)
    - Periderm/Bark – corky tissue that replaces epidermis on secondary plant parts (woody)
Plant Tissues

Vascular

- Function
  - Conduction of water, nutrients, sugars and hormones throughout the plant

- Consists of
  - Phloem – conducts water, sugar, hormones, etc. down and up roots, stems, and leaves (moves from where produced to where needed)
  - Xylem – conducts water and nutrients up roots, stems, and leaves
Plant Tissues

■ Ground

– Function
  ▪ Storage, support, filler tissue and site of photosynthesis

– Consists of
  ▪ Cortex – outer region of stems and roots
  ▪ Pith – center of stems
  ▪ Mesophyll – middle of leaves and flower parts
Flower Dissection

- Observe external characteristics to determine class and type of plant
  - i.e. Angiosperm/Gymnosperm, Monocot/Dicot
- Cut flower in half laterally
- Observe internal characteristics
- Label the worksheet and tape the corresponding plant part to the paper.
Review

- **List and Describe the plant organs**
  - Flower
    - Complete / Incomplete
    - Perfect / Imperfect
    - Sterile
  - Leaf
    - Simple
    - Compound
  - Stem
  - Root
    - Primary
    - Secondary
    - Root Hairs

- **List and Describe the plant tissues**
  - Dermal
    - Epidermis
    - Periderm/Bark
  - Vascular
    - Xylem
    - Phloem
  - Ground
    - Cortex
    - Pith
    - Mesophyll
Review

- What are the 5 flower types?
  - Complete – all flower parts
  - Incomplete – lacks one or more of the flower parts
  - Perfect – contains both pistil or stamen
  - Imperfect – lacks either pistil or stamen
  - Sterile – both stamen and pistil are absent

- What are the 3 root parts?
  - Primary Root
  - Secondary Root
  - Root Hairs

- What are the 2 types of root systems?
  - Tap Root System
  - Fibrous Root System