Plant Form and Function

Today’s topics:
- Plant Tissue systems
- Primary growth of shoots and roots
  - Meristems
- Secondary Growth
  - Xylem and Phloem
  - Vascular cambium
  - Tree rings

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Primary Shoot Growth

Shoot apical meristem
- Young leaf
- Developing vascular strand
- Axillary bud meristems

Epidermis
- Ground
- Vascular

Stem structure

Vascular Tissue

Vessel
- Tracheids

Tracheids
- Pits
Roots

Key to labels:
- Dermal
- Ground
- Vascular

Root cap
Apical meristem
Zone of cell division
Zone of elongation
Zone of differentiation
Vascular cylinder
Cortex
Epidermis
Root hair
100 µm

Root structure

Dicot
Monocot

Exodermis
Mesoderm
Cortex
Exodermis
Mesoderm
Xylem
Phloem
Xylem
Phloem

Secondary Growth
The Vascular Cambium always produces
• Xylem toward the inside
• Phloem toward the outside

Annual Rings

Art interlude: Tree within a tree
annual rings record the tree’s history of growth

Artist Giuseppe Penone

Spiral Growth of Shoots

Why? How?