

I. What is stem?

II. How do stems start?
in dicots

III. Structure

A. internodes

B. nodes

axil

IV. How do stems grow longer?

A. terminal buds

B. axillary buds

C. evidence of previous growth and leaves

1. bud scars

2. leaf scales

D. Q: What happens if the main shoot apex is killed?
apical dominance

Q: What is a difference between a woody bush/shrub and tree?

pruning

V. How do they grow wider?

A. first growth = primary growth

1. protoderm

2. ground meristem

3. procambium

4. *primordia*

B. later (for some plants): lateral/secondary meristems

1. vascular cambium

2. cork cambium

VI. Variations on primary growth of stems

A. groups of flowering plants/angiosperms - internal arrangement of tissues

a. dicots

b. monocots

B. arrangement of leaves = phyllotaxy

1. alternate

2. opposite

3. whorled

C. variation in the vascular tissue - traces & gaps

1. leaf trace

2. leaf or bud gap

VII. Wood and Bark

A. yearly ring structure (from vascular cambium inward)

1. springwood

2. summerwood

B. different cuts

1. radial

2. transverse

3. tangential

C. other terms

1. heartwood

2. sapwood

3. different woods

4. vascular cambium: making new xylem & phloem

5. cork cambium: making new outer bark

6. bark variations (including lenticels)

VIII. Specialized stems

A. above-ground variations

1. tendril or hook

2. thorn

3. cladophyll

4. runner

B. partially or all below-ground variations

1. bulb

2. corm

3. tuber

4. rhizome