SA #45	STEM ANATOMY: Primary and Secondary Growth
BIO 2130	Stern et al., Chapter 6

LOOKING BACK: We have studied the major kinds of *simple plant tissues* (parenchyma, collenchyma, and sclerenchyma) and *complex tissues* (e.g. epidermal and vascular tissues) with the help of Chapter 4 and the detailed Study Outlines of SA #41and SA #43. You have also been completing laboratory studies of plant cells and plant anatomy. These visual resources and experiences will help your reading and study of Chapter 6 to be a pleasant culmination of your efforts toward a general understanding of stems and how *primary growth* and *secondary growth* occurs.

READING & RESOURCES: Read Stern, *et al*. Chapter 6, pages 86-107.
Handout: "Vascular Plant Development" and "Secondary Growth in Stems"

PROCEDURE: Your objective here should be to consolidate your "stems laboratory" experience with the helpful reading and illustrations in Chapter 6. It may be helpful for you to read the "Overview" and "Summary" and scan the chapter first. Have your labeled laboratory photos handy as you read this well illustrated chapter. Use the Study Outline in SA #41and SA #43 as well as the "VASCULAR PLANT DEVELOPMENT" concept map to aid your effort to develop a conceptual understanding of stem anatomy and plant development.

TEXT QUESTIONS: The chapter-end "Review Questions" and "Discussion Questions" are helpful.

LECTURE DISCUSSION QUESTIONS:

1. Analyze the following definition of a *stem*: "A cylindrical, vertical, aerial axis of a plant that functions in support." Explain how this definition does or does not encompass all of the variety of stems. Based upon your study, write your own definition of *stem*.

2. How would you distinguish the typical *monocot* stem from that of a *dicot* when given opportunity to observe the following: (a) the external features of a 1-foot section of a growing stem; (b) a cross-section of a monocot and a dicot stem?

3. Explain how a dicot stem develops *vascular cambium*. Use the following in your discussion: *procambium, latent procambium, fascicular* and *interfascicular cambium*, and *cortical parenchyma*. You will receive a separate page entitled "Secondary Growth in Stems."

4. Given a slide or illustration of a woody stem cross section (*e.g. Tilia*) can you locate each major region of the stem (*e.g. periderm, cortex, phloem, vascular cambium, xylem*) and then each tissue type within these regions? Finally, explain *annual rings* and how the woody stem increases in diameter.

LINKS TO STEM SLIDES: At the BIO 2130 Laboratory Resource Page, click on "Botany Laboratory Slides", then "PLANT ANATOMY/MORPHOLOGY " slides.