Lesson 6 – Plant Diversity and Structure
Biology 182 Pima Community College, Downtown Campus

Lesson 6 Learning Objectives
After completing this lesson, you should be able to:
Describe functions of the sporophyte and gametophyte in the plant lifecycle, and identify which is haploid and which is diploid. Describe characteristics of nonvascular plants and identify related phyla. Explain what limits distribution of nonvascular plants. Describe the function of spores, and indicate whether they are haploid or diploid. Describe characteristics of seedless vascular plants, and what limits their distribution. Explain why seeds and pollen are evolutionary advantages. Define and compare gymnosperm and angiosperms. Define and compare monocots and dicots. Compare the arrangement of vascular tissues in monocots vs. dicots. Describe primary and secondary growth, and which tissues are involved. Explain the functions of the xylem and the phloem. Describe how guard cells and stomata regulate gas exchange. Describe the functions of roots, stems and leaves. Explain how wood is formed. Describe how tree rings form and how they relate to a tree’s age.

Step 1: Textbook Questions
There is no textbook assignment for this lesson! You’ll cover the important content for this lesson through the multimedia activities and the lab activities. Read Chap. 29 pages 576-578, Chap. 30, and Chap. 31 if you would like extra information or a review.

Step 2: Multimedia Activity
Use the textbook publisher's website to complete the following activities. Don’t worry that the numbering is different than the units in your text – these activities are from a previous version of the text.

37.1 – ESP – Plant characteristics
1. The _____________ are direct descendants of the first plants.

2. ________________ are similar to the first vascular plants found on land.

3. What is meant by the term “alternation of generations”?

37.1 – ESP – Life cycles of plants
4. Where does meiosis take place?

5. Spores give rise to the ___________. Is this structure haploid or diploid?
6. After fertilization occurs, the structure that is formed is called the _______________. Is this structure haploid or diploid?

37.2 – ESP – Nonvascular plants
7. Name the three phyla of nonvascular plants.

8. Which phase of the plant life cycle is dominant for nonvascular plants?

9. How does the lack of true stems, roots and leaves limit the size and location of nonvascular plants?

10. __________ are the largest group of non-vascular plants.

11. Label the following diagram:

37.3 – ESP – Seedless vascular plants
12. Why is the evolution of vascular tissue so important?
13. ___________ are the largest group of seedless vascular plants.

14. Why do ferns grow in moist habitats?

37.4 – ESP – Gymnosperms
15. Name three evolutionary advances that seed plants have over non-seed plants.

16. How does a seed enhance the plant zygote’s survival?

17. What is the main difference between gymnosperms and angiosperms?

18. Where are conifers most frequently located?

37.4 – ESP – Angiosperms
(skip slides 5-9 in this activity)
19. How do flowers attract pollinators?

20. What type of tissue becomes fruit?

21. Name three examples of monocots and three examples of dicots.

22. Crops such as corn, rice and wheat are members of what family?
38.1 – ESP – Meristems
23. What is the function of the apical meristem?

24. What is the function of lateral meristems?

25. What is primary growth?

38.2 – Movie – Vascular system of plants (requires Real Player)
(If you link to this from the home page, you must navigate to this movie.)

26. ______________ greatly increase the surface area of roots.

27. Water and nutrients enter the plant through vessels called ______________.

28. ______________ transports sugars, amino acids and hormones

38.2 – ESP – Ground tissue
29. Most of the bulk of the plant is ______________ tissue.

30. What type of ground tissue contains chloroplasts?

38.2 – ESP – Dermal tissue
31. Where is the epidermis?

32. What is the function of the cuticle?

33. What is the function of guard cells?

34. What is the function of root hairs?
35. What are stomata?

**38.2 – ESP – Vascular tissue**

36. What are the two types of vascular tissue?

37. Are xylem cells alive?

**38.3 – ESP – Roots**

38. In roots, where does mitosis occur?

39. What is the function of the root cap?

**38.4 – ESP – Stems**

40. What are the functions of stems?

41. Name two common vegetables that are modified stems. (Hint - one is technically a rhizome, and one is a tuber.)

**38.4 – ESP – Cambia** (Requires Real Player)

42. What is secondary growth?

43. What layers of tissue form bark?

44. Wood is composed of what type of tissue?
45. Which meristematic tissue is responsible for secondary growth? Where is this tissue located?

46. As cambium divides, cells on the inside differentiate to become ____________ and cells outside differentiate to become ________________.

47. Why does a tree's girth increase?

48. Why are tree rings visible?

38.5 – ESP – Leaves
49. In what type of plant cells does photosynthesis occur?

50. What is the function of stomata?

51. How do guard cells regulate water loss from stomata?

Step 5: Self-Quiz
Use the online self-quiz to review material from lesson 6 to prepare for your exam.