**BIOL 112 – OUTLINE # 4 – PLANT STRUCTURE, GROWTH AND DEVELOPMENT**

**Figure locations are for the 5th edition of Freeman; check for corresponding chapter in the 6th edition**

1. Characteristics that define the plant kingdom
2. Cell types
3. parenchyma – 37.16, p. 745
4. collenchyma – 37.18, especially c, p.745
5. sclerenchyma – 37.19, p.746
6. xylem elements – 37.20, p.746
7. phloem elements – 37.21, p.747
8. Tissue types
9. epidermal tissue – Google Image “plant epidermis”, see also pp.743-744
10. vascular tissue – Google Image “plant vascular tissues”, see also pp.746-747
11. ground tissue – Google Image “plant ground tissues”, see also pp.744-746
12. meristem tissue – Google Image “plant meristem tissue”, see also pp. 740-742
13. Vegetative organs and tissue organization – this information is scattered throughout Chapter 37, and is not very complete with images
	1. roots – Google Image “monocot root vs dicot root”
	2. stems – Google Image “monocot stem vs dicot stem”
	3. leaves – Google Image “monocot leaf vs dicot leaf cross section”

**Let me know if you need more help with 4 and 5 – these processes are well described and illustrated in pp. 740-741 and pp.748-751, though pay attention in class to talk on de-differentiation. It’s given short shrift on p. 744 and figure 37.17**

1. Developmental flexibility and the function of meristems
	1. indeterminate vs. determinate growth
	2. de-differentiation
	3. location of meristems determines pattern of plant growth
2. Growth
	1. division
	2. expansion
	3. differentiation
	4. primary growth in roots
	5. primary growth in stems
	6. secondary growth