AP Biology Mr. Spencer

Chapter 5: Structure and Function of Macromolecules
Campbell, Biology, 7th Edition

Answer each of the following questions on separate paper. All answers may be typed or hand-written… but do your OWN work.

1. What is a polymer, and in general, how are they linked together?

2. Explain (and diagram) how polymers are assembled in living cells.

3. Explain (and diagram) how polymers are disassembled in living cells.

4. Define the term carbohydrate. What are the main uses of carbs in living cells. Your definition should include a description of their general structure.

5. What are monosaccharides? Give an example of a typical monosaccharide used in living cells and explain how it is used.

6. Explain and diagram the difference between an aldose and a ketose.

7. Draw the three common forms of glucose found in living cells. Which is the most common form?

8. What is a disaccharide? What holds them together, and how are these linkages formed? Give examples of some common disaccharides found in living cells.

9. What is a polysaccharide? What are the major uses for polysaccharides in living cells.

10. How does energy storage differ in plants and animals? What is similar about the way plants and animals utilize their energy stores?

11. What is cellulose and what is its major role in living cells?

12. Why are humans able to digest starch and not cellulose if both are polysaccharides composed of glucose monomers.

13. How have some organisms evolved relationships with other organisms to allow the digestion of cellulose?

14. What is the major characteristic that distinguishes lipids from other macromolecules?

15. What is a fat? Draw a fat, describe their structure, and explain how fats are synthesized in living cells.

16. What is the major difference between a saturated and an unsaturated fat?

17. How can fats be both detrimental and essential to living cells at the same time?

18. Describe (include drawings) the structure of phospholipids. What two ways can phospholipids self-assemble when placed in water?

19. Where are phospholipids found in living cells? How does their structure perfectly suit them for this role?

20. What is cholesterol? How, specifically, is cholesterol detrimental and essential in living cells?

21. What are the major roles of proteins in living cells? Why are proteins capable of performing so many diverse functions in organisms?

22. What is an amino acid? How many different amino acids are there in living cells? How are amino acids assembled into polypeptide chains?

23. Distinguish between the four levels of protein organization. What determines protein conformation?

24. What is denaturization? What conditions typically bring it about?

25. Explain the role of chaperone proteins in living organisms.

26. What determines the primary structure of proteins in living cells?

27. What are nucleic acids? Explain their role in the cell, their structure, and distinguish between any different types found in living cells.

28. Explain the relationship between nucleic acids and proteins.

29. What is a nucleotide? Distinguish between the different types of nucleotides in living cells.

30. Describe the structure of DNA. Who discovered this structure? What is meant by complementary?

31. Explain how DNA and proteins can be used to determine the existence of evolutionary relationships between species.